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EXPERIMENTAL INVESTIGATION ON STRENGTH PROPERTIES OF ULTRAFINE FLY ASH AND MICRO SILICA AS MINERAL ADMIXTURES FOR VERMICULITE MORTAR

By

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ABSTRACT

Concrete is mostly used as a building material and while preparing concrete mix the natural resources are being used extensively. Due to large-scale construction being taken up, a steady sand mining is taking place at an alarming rate. To overcome the problem Vermiculite aggregate is partially used as a replacement to sand. Exfoliated Vermiculite (EV) can be effectively utilized in a silica-based material in building industry. In this present study, an attempt has been made to study the mechanical properties of EV cement mortar with different percentages of i.e. 5%, 10%, and 15% of Micro Silica and Ultrafine Fly Ash mineral admixtures as partial replacements of cement, and EV at 20%, 40%, 60%, and 80% by weight as partial replacement of fine aggregate. It has been observed that the required compressive and flexural strength of mortar are achieved when 10% Micro Silica and 5% Ultrafine Fly Ash are used as partial replacement by weight of cement and 20% EV is used as a partial replacement by weight of fine aggregate.

Keywords: Cement Mortar, Compressive Strength (CS), Exfoliated Vermiculite (EV), Flexural Strength, Micro Silica (SF), Ultrafine Fly Ash (UFFA).

INTRODUCTION

The lightweight concrete can be defined as a type of concrete, which includes an expanding agent when added it increases the volume of the mixture and giving additional qualities such as nail ability and lessened dead weight. The main advantages of lightweight concrete are its lower density and thermal conductivity due to which there is a reduction in dead load, faster building rates in construction and lower haulage and handling costs.

Structural lightweight concrete usually manufactured by using artificial lightweight aggregates such as expanded clay, shale and slate. However, rapidly increasing fuel prices in recent decades and a corresponding increase in the production costs of these aggregates have renewed the interest in natural lightweight aggregates such as Pumice, Scoria, Rhyolite, Perlite and Vermiculite.

The use of lightweight concrete started from more than two thousand years ago in the Roman Empire. The most known structures built using lightweight concrete during that time were the Port of Cosa, the Pantheon Dome and the Coliseum (ACI 213R-03, 2003). The Port of Cosa was built on the west coast of Italy, in 273 BC. The designers of the port used natural lightweight aggregates (Pumice and Scoria) from the volcanic resources located at 40 km away instead of using locally available aggregates such as beach sand and gravel for the construction. The harbour consists of four piers, which had resisted the forces of nature except for the surface abrasion for almost two thousand years and it is now abandoned due to siltation. Today, the applications of lightweight structural concrete extended not only to high-rise buildings but also to bridges and marine structures. Stolmen Bridge and Heidrun Tension Leg Platform are significant examples of recent applications. However, few studies are available with a focus on natural lightweight aggregates and even

Estimation of Compressive Strength of Concrete by testing the Pozzolanic Reactions of Blended Cement Mortars using Bolomey's Equation

M.V.S.S.Sastri, K.Jagannadha Rao, V.Bhikshma

Abstract: To experimentally investigate the effect of the presence of Supplementary Cementitious Materials (SCMs) in concrete strength gain by using the efficiency factors in Bolomey's equation to the cement mortar. The quaternary blended cement mortar consists of Fly ash (FA) at 0, 20 and 30%, micro silica (SF) at 0, 5 and 10% and Nano silica (NSF) at 0, 2, 3 and 6% replacement to cement. To study the compressive and flexural strength of mortars a total of 63 mortar mixes, with a cement-sand ratio of 1:2.75 were cast and tested; out of these mixes, 27 were variable w/b ratios based on consistency and remaining 36 were with fixed w/b ratio of 0.485. The mixes using SF and NSF had shown an improved performance while FA at 20% optimum indicated strength on par with the control mix. In triple blended mixes, all the combinations of NSF-SF, NSF-FA and SF-FA improved the performance of mortar. Bolomey's equation was used to find the Efficiency of SCMs in mortar and concrete mixtures. Concrete mixes with two different cement contents along with a confirmation test using another cement quantity were carried out to identify optimum proportions of quaternary blended mixtures.

Keywords: Bolomey's Equation, Consistency, Initial setting time, Quaternary blended mixes, Supplementary Cementitious Materials.

HIGHLIGHTS:

- Utilization of waste materials using Bolomey's equation while making Cement mortar and concrete making.
- Relating the efficiency of pozzolans in a mortar with concrete by using Bolomey's equation.
- Workability of Supplementary Cementitious Materials was identified by consistency, Initial setting time with reliability.

I. INTRODUCTION

The utilization of chemical admixtures and a large quantity of OPC is one of the causes of increasing the cost of High Strength Concrete.

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Smith[1] defined the cementing efficiency factor 'k' of pozzolana by which the amount of cement it could replace changing the property to be investigated; typically the compressive strength (CS) is a factor related to many properties of concrete. It was initially applied to fly ash, and later many authors utilized this concept to all pozzolanic materials. Neville[2] has stated that by controlling the performance of cement mortar in concrete, a stronger concrete can be made. Therefore, several researchers carried out investigations to alter the properties of cement mortar and paste by using finely divided pozzolanic materials, which is an excellent alternative to reduce the cost, especially if they are industrial by-products or wastes. Nielsen[3] had proved that Bolomey's expression relating the strength of concrete could also be applied to hardened cement pastes when w/c > 0.15and also proposed two expressions with w/c less than and more than 0.4. Ganesh Babu and Nageswara Rao[4] proposed three efficiency factors for pozzolans in concrete after conducting tests on fly ash, micro silica and GGBS. Appa Rao[5] proved that the modified Abram's and Bolomey's equations give reasonably good predictions of the CS of mortar mixes. Tangpagasit et al.[6] had shown that pozzolanic reaction of fly ash mortar depends on the average size of particle and curing period. Considering Abram's law, Wong and Abdul Razak[7] recommended an approach for the evaluation of relative strength of pozzolanic material and also stated that before any mix design the 'k' value has to be re-ascertained. Erdem and KIrca[8] had stated that by mixing two pozzolanic materials can compensate for the shortcomings of the other material. Due to the rapid progress in Nanotechnology, new materials of Nano-scale with highly improved characteristics are available. Qing et al.[9] has stated that micro silica is a standard pozzolana for use in High strength concrete (HSC), but based on experimentation the pozzolanic activity of NSF is higher than SF hence a small amount of NSF can effectively digest Calcium Hydroxide (CH) at early ages when used along with SF and FA. Shih et al.[10] utilized small dosages of NSF in mortar making and found that the strength of mortar increased up to 14 days of curing later, the increment is decreasing. Ltifi et al.[11] concluded that due to the presence of NSF, the microstructure had become dense, and hence, mechanical properties had improved. Hou et al.[12] and Pacheco-Torgal et al.[13] have stated that there is a significant change in the mechanical and

Effect of *Bacillus Subtilis* on Concrete with Steel Fibers and Fly Ash

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Abstract - *Over more than a decade, microbially induced carbonate precipitation is in use to increase mechanical properties of concrete. The use of self protected bioconcrete has become a topic of thrust area of research worldwide, especially employing bacterial strains. Concrete has an ultimate load bearing capacity under compression but the material is weak in tension. The steel reinforcement have the capacity to take the tensile load, while the concrete cracks under tension. On the other hand, the concrete protects the steel reinforcement from the environment and prevents corrosion. However, the cracks in the concrete cause a major problem which affects the durability of the structures. Here the ingress of water and chloride ions takes place and deterioration of the structure starts with the corrosion of the steel. The conventional methods to increase the strength and durability of the structure and seal the cracks formed in the structure, epoxy injections or latex treatment are used. Unfortunately, the chemicals used in these treatments are expensive and cannot reach the deeper portions of the cracks in the structure. Hence, the present study was aimed to attempt a self healing concrete with increased durability and tensile strength using steel fibres and fly ash. M-30 grade concrete has been tested in the present study with various concentrations of fly ash and steel fibre (1.5%) along with and without bacteria i.e. Bacillus subtilis, to evaluate various mechanical properties of the concrete mix. Concrete mix with bacterial concentration of $1x10^5$ cells per ml. along with 1.5% steel fibre and 20% fly ash was found to show more split tensile and compressive strength (50.13 MPa.) compared to mix without bacterial cells (45.50 MPa) after 28 days of curing. Mix with $1x10^5$ cells/ml bacteria, 1.5%steel fiber and 0% fly ash has less weight loss and strength loss compared to other mix grades devoid of bacteria*

Keywords : *Concrete, Self healing, Fiber, Fly Ash, Bacillus subtilis, Mechanical properties*.

INTRODUCTION

In the past few decades the microbes were known to have deterioration of construction material in the form of leaching, discoloration, internal pressures mechanical erosion etc.[1]. The studies on beneficial effects of microorganisms on building materials specially microbially induced calcium carbonate, ($CaCO_3$, calcite) precipitation in concrete as crack remediation is challenging since more than a decade [2]. Several bacteria are known to precipitate $CaCO_3$. The physical and mechanical properties of calcite are closely similar to those of hardened concrete and hence it can be used as a crack filling agent for concrete structures. It is produced biologically and does not possess any harmful chemicals. Also, its production is self-sustained, happens without any human support and has the potential to remediate every minute crack. These properties of Calcite make it a perfect filling material of cracks developed in concrete [3]. The bacteria are incorporated into the concrete while mixing. This type of concrete is called Bacterial Concrete. It is also called self-healing concrete as the healing process is independent and autonomous [4]. The bacteria become active as soon as they get in contact with water and precipitate Calcite eventually, facilitating the filling of minute voids generated on the account of the physical structure of the constituents of concrete. This process takes place till there is an availability of water. Once the concrete hardens, the water supply is cut off, the bacteria becomes inactive and remains dormant till there is any further supply of water. Hence, it increases the strength of concrete and also repairs the cracks formed, protecting the structural integrity [5] and durability of the concrete [6, 7]. Bacterial spores are specialized cells which can endure extreme mechanical and chemical stresses and spores of this specific genus are known to remain viable for up to many years. Spores are dormant but viable bacterial spores immobilized in the concrete matrix will become metabolically active when

Progressive Collapse Analysis of RC Structure Using Push over Analysis

Mirza Abdul Junaid Baig, Swami Ranga Reddy.

***Abstract**: Explosions almost instantaneously damage the structures. The direct action of the high intensity blast on the exposed surfaces of the building may cause damage to the structural components like columns and beams. The failure of a member in the primary load resisting system leads to redistribution of forces to the adjoining members and if redistributed load exceeds member capacity it fails. This project aims to present an analytical study on the effect of column removal at different location in a building subjected to earthquake and static wind loading. Pushover analysis method were conducted and the behavior of all models were studied considering various parameters such as storey displacement, storey drift, storey stiffness and time periods. When a multi storey building is subjected to sudden column failure, the resulting structural response will be moving from linear to non-linear, For the analysis G+10, G+20 and G+30 models with column removal at corner, interior and middle of the exterior panel are considered. All buildings are analyzed by using ETABS as per IS 456:2000.*

Keywords: RC Structure, Column removal, Pushover analysis, progressive collapse analysis.

I. INTRODUCTION

After several disastrous building collapses, progressive collapse has become a hot issue in civil engineering. It is the collapse of an entire structure or an essential part of it because of the initiating local damage of the primary structural component. To reduce the risk of progressive collapse, the General Service Administration presented a practical guideline (GSA2003) for design, the Department of Defense also presented a guideline (DOD2009) for the method of evaluating the progressive collapse potential. The analysis method recommended in these guidelines is the alternative path method with column removal. Different analytical procedures may be used, including Linear Static, Non-linear Static, and linear Dynamic. Non-linear dynamic analyses have the most accurate results, but are more complicated and time-consuming. The nonlinear static analyses are time-saving, but the amplification factor should be considered to account for dynamic redistribution of forces.

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Recently, the behavior of reinforced concrete structures against progressive collapse have been studied widely.

Figure 1 – Progressive Collapse of Building

Structural progressive collapse is the result of the spread of an initial local failure in a manner analogous to a chain reaction that leads to partial or total collapse of a structure. Under most circumstances, the collapse is generally initiated by abnormal loads, including explosions and collisions. Building progressive collapse under blast loads can be considered as two successive stages:

- Local damage of key elements resulted from blast loading;
- Structural response due to the sudden failure of key members.

II. LITERATURE REVIEW

LI Zhongxian and SHI Yanchao [1] studied on the "Methods for Progressive Collapse Analysis of Building Structures under Blast and Impact Loads". This paper presents an overview of current progressive collapse analysis methods available in the literature. The proposed method gives more reliable predictions of the structural progressive collapse than the alternative load path method, which neglects non-zero structural conditions and damage in the structural members when progressive collapse starts.

WANG Tie-cheng and LI Zhi-ping [2] studied on the progressive collapse potential of a 10-storey concrete frame structure was investigated using nonlinear static analysis. 15 different cases were considered and their performances were compared with each other. From the nonlinear static analysis results, most of longitudinal beams in upper floors and slabs above the failure column would collapse as the results of removing an exterior column, no beams and slabs would collapse when an interior column at ground floor was removed.

Meng-Hao Tsai and Tsuei-Chiang Huang [3] studied on the effects of three common types of

Transforming Lead-Free Fuel: Filter less Filtration Process by using Ultrasonic Waves

R. Srivel, Ramanarayan Sankriti, P.Nandha Kumar

Abstract— The main objective of the study is focused on removing the impurities in fuel substances. In the filtration process, sound waves are passed, as the longitudinal wave is also called as a compression wave. Ultrasonic signals are created with the help of transformer and that feeds into the transducer. When the output of the transducer is passed to the liquid medium it collides with dust particles and pushes the dust particles downwards. The subsequent ultrasonic waves retain the impurities in the bottom. Then the pure material is obtained in the upper part and the impurities in the bottom are removed by opening the lower part. The proposed method of ultrasonic filter will filter the dust particles in the liquid using polystyrene microscope and frequency sweep techniques, it generates the constant longitudinal ultrasonic waves in horizontal direction of a glass tube having large radius. This method makes the dust particles to settle down at the bottom and pure liquid will be present at the top layer.

Keywords—Filtration, transducer, micro-particle, ultrasonic waves

I. INTRODUCTION

The density of micro-particle is manipulating caused by unleaded fuel. This method helps to trap, sort, and filter the unleaded fuel into a purified fuel which is a crucial process in the field of Automobile technology. It can improve the engine performance and also better the mileage. However, in today's petroleum market the available of liquid contains a high level of lead particles that creates very serious environmental issues and various hazards on the human's health (1).

There are various methods for identifying micro-particle manipulations based on the physical principles which have identified by adding optical radiation force and electrostatic force. For example, the manipulation of bio-cells identified in biotechnology is practically possible. the proposed ultrasonic filtration method uses Electronic timer circuit is used to give an timing pulse to frequency sweep technique to generates a constant longitudinal aquatic ultra-sonic Aquatic sound waves inside the liquid in horizontal (longitudinal) direction.which creates a constant vibration inside the liquid and it makes the micro dust particles to move towards at pressure node or anti node.[5]

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This makes the microscopic dust particles to vibrate and to settle down at specific region of the channel the remaining liquids are allowed to flow through the different outlet of the glass tube, without using any barrier filter inside the tube. In existing method [6],[7] such as barrier filtration and centrifugal filter uses a separate filter membrane inside the glass tube to filter the dust particle, in that method even though the microscopic dust particles will still exist in the liquid layer.

The frequency sweep technique generates the ultra-sonic aquatic sound waves with respect to frequency in the range of few MHZ to GHZ. The deviation in the frequency will reduces the filter efficiency. In such cases the node plane should be situated at the center of the channel in order to protect the resonance of the frequency. In the proposed method we constructed the node plane is placed at the center of the channel and creates a two outlet in the glass tube having large diameter. One outlet is used to collect the purified liquid and another outlet is used to collect the dust particles. The based on different time periods the frequency sweep techniques generates different frequency based on the user selection of dust particles size.
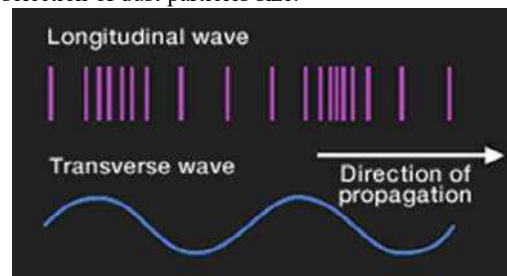

Fig longitudinal waves

Our proposed technique will make a simple flow-through filtration method by using frequency sweep technique. In the proposed approach, the direction of the ultra-sonic sound waves will create an acoustic radiation force on microscopic dust particles is perpendicular to the direction of liquid flow, whereby radiation force by the created by small ultra-sonic aquatic longitudinal waves can translocate microscopic dust particles instantly. The modularized device with narrow channel is made of steel and acrylic fiber.

II. EXISTING SYSTEM

Coarse filtration, microfiltration, ultrafiltration, reverse osmosis, distillation are the existing systems for purification. Distillation method: The action of purifying a liquid by a process of heating and cooling. The major drawbacks of

Smart Automation Technique to Collect Dry and Wet Waste using IOT Module: to Achieve our 'SBM' Mission

C.Jenifa Latha, Ramanarayan Sankriti, M.Chandra sekhar

Abstract— The global waste production in now a days is increasing at a rapid rate, it is predicated that it will give rise to 28 billion tonnes per year by 2051, one-third of the whole global Asian continent is majorly contributed by India and china. The Main objective of the proposed method is to achieve clean India mission abbreviated as SBM. To make our urban and rural areas surrounding to be clean without any dry and wet waste. So our proposed method is designed to collect dry and wet Waste using IOT and embedded system Technology. The government has provided two dustbins in every place to dump the waste, one for dry waste and other for wet waste. The sensors node is kept inside the dustbins. When it becomes full it sends the signal to the Transmitter node. After Receiving the signal from sensor node, it updates details area and location in the common cloud IOT database. Then it sends the information to particular Location vehicle Driver to collect the waste.in the vehicle it has separate provision to collect dry and wet wate using conveyor belt and h-bridge motor driver circuit. After collecting the waste it updates the information to the common cloud database system. node

I. INTRODUCTION

In our country India producing nearly 58 million tonnes of waste per year. The per capita of waste generated in our country India ranges from 0.199 Kg to 0.599 Kg. It is predicated that, especially in developed citys, produces 0.7 kg of waste per person per day. The advance development and growth in industry automations have created a major impact on the environment by affecting land, water, air, and noise pollution Due to this it reduces our purity in natural air, good water becomes polluted water. these things will lead to global warming, greenhouse gas, acid rain, etc. Dumping of huge plastic waste will affect the drought, as it gives chances to reduce our natural rainfall. The 75% of total waste will spoils our natural surrounding environment. ,by observing all the natural calamities it gives suggestions to dispose the waste materials properly without affecting the environment .This improper disposal of waste causes infectious and chronic diseases to humans and animals. The various charts show in the figure shows the total percentage of waste produced in every country
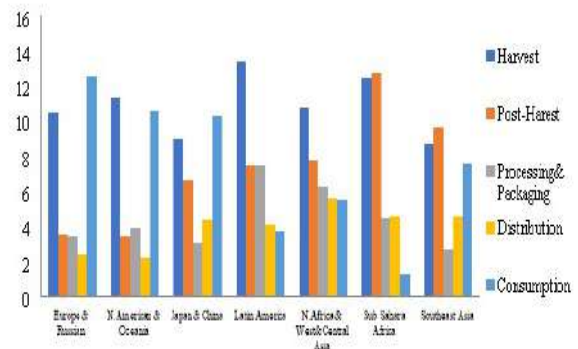

Chart 1: Percentage of World Food Wastage

Chart 2: Electronic Waste by Top 10 Countries*
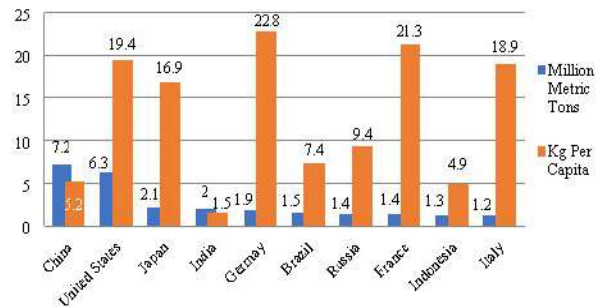
Chart 3: Percentage of Electronic Waste, Incinerated and Recycled

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Prediction of Recycled Concrete Aggregate Self-compacting Concrete Compressive Strength using Mathematical Model

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ABSTRACT
Sustainable development aims at improving the standard of life without compromising the environmental qualities and for future needs. These objectives can be achieved through recycling of construction/demolished waste. In past, land filling of construction and demolished waste materials was the general solution. As raw construction material charges have risen dramatically, we have to look for alternative solutions and methods, such as recycling of demolished waste. Recycled aggregate concrete not only solves the problem of construction and demolition waste disposal, but also conserves the use of natural resources in effective manner to maintain ecological balance. Thus, recycled aggregate concrete has become potential material of construction industry, and it requires all attention in terms of focused research to explore it fully. In the present study, RCA was used as partial and full replacements of NA to produce self-consolidating concrete (SCC). Different SCC mixes were produced with RCA substituting 0%, 25%, 50%, 75%, and 100% NA by weight. The present study aims at developing a mathematical model/empirical model/multiple regression analysis proposed to estimate to predict the compressive strength of NASCC and RASCC different grades of concrete with different proportions of RCA. The empirical model developed resulted in predicting the compressive strength of SCC with recycled aggregate concrete (RASCC) mixes with a maximum error of 10.9% which is within acceptable limit considering the heterogeneity of concrete mixtures and certain limitations of experimental work. Further, the present study has also established a close correlation between theoretical (predicted) and experimental values of compressive strength having correlation coefficient value of 0.98.

Keywords: mathematical model, self-compacting concrete (SCC), recycled concrete aggregate (RCA), compressive strength, multiple regression analysis

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INTRODUCTION
Concrete has been in use as a building material for more than centuries. Concrete, a man-made material is a combination of cement, sand, aggregates and water in different proportions so as to attain strength to the structure. In the recent years, the notation of concrete has been

Influence of Temperature on Tensile Properties and Fracture Behavior of High Strength Stainless Steel

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Abstract - *The history of steel dates back to the 17th century and has been instrumental in the betterment of every aspect of our lives ever since, from the pin that holds the paper together to the reinforcement in the construction industry. Path breaking improvements in manufacturing techniques, access to advanced machinery and understanding of factors like heat treatment, corrosion resistance have aided in the advancement in the properties of steel in the last few years. In this research the results of a study aimed at the influence of temperature on tensile fracture behavior of stainless steel 2304 is discussed. The microstructure of the as received steel was examined and characterized for the nature and morphology of the grains and the presence of other intrinsic features in the microstructure. The tensile tests were done on a fully automated closed-loop servo-hydraulic test machine at room temperature as well as elevated temperature. The failed samples of high strength steels were examined in a scanning electron microscope for understanding the fracture behavior. The factors contributing to failure are briefly discussed in light of the conjoint and mutually interactive influences of intrinsic microstructural effects.*

*Key Words***:** Duplex Stainless Steel, Tensile Strength, Fracture Behaviour, Damage analysis.

1. INTRODUCTION

In the domain encompassing materials, science and engineering, high cycle fatigue has been defined to be the end result of progressive, localized, and permanent structural damage that often occurs when a material and/or structure is subjected to tensile stress and cyclic fatigue [1]. In actual practice, two aspects of the fatigue properties of a material must be considered. These are, (a) fatigue life, and (b) fatigue crack growth behavior. In this research study, preliminary experiments were conducted with the primary objective of understanding the influence of test temperature on tensile behavior of a high strength stainless steel. Test specimens of the chosen stainless steel were deformed at ambient temperature and an elevated temperature. The elevated temperature chosen was 205^{0}C. The results are analyzed and fractographic observation of the fracture surface was used to provide an understanding of the microscopic mechanisms governing the fracture.

2. LITERATURE REVIEW

2.1 Background

The gathering of metals based entirely on compositions, which includes the family of stainless steels initiated way back in 1913 in the city of Sheffield, England. Harry Brierley was attempting various combinations and as could be expected he noticed that the specimens while being cut during one of these trials failed show evidence of rusting and were also found hard to carve. Upon further exploration of this curious metal he found that it contained around 13% chromium. This was immediately classified as stainless steel. This unique property offered by stainless steel led to its selection and use purposes of cutlery. It was cutlery made from stainless steels that eventually made the company based in Sheffield very popular. At around the same time sustained advances were being made in France in the domain spanning steels, which culminated in the development and emergence of austenitic stainless steels. As of this date, the overall utilization of stainless steel is continuing to grow in industries [2].

2.2 The Family of Steels

Stainless steels are iron-based compounds containing around 10.5% chromium. This does result in a defensive self-mending oxide film, which is the primary motivation behind why this class of steels has been given the trademark "stainlessness". The capacity of the thin oxide layer to mend itself implies that this steel is safe against corrosion regardless of the severity of the surrounding environment and the extent of corrosion on the surface. This is not the situation when carbon steels or low amalgam steels are shielded from consumption using either metallic coatings made of zinc or cadmium, or by the use of natural coatings, such as paint [4]. Although every stainless steel relies upon the use of chromium, other alloying elements are also regularly added with the primary purpose of achieving a better combination of properties. Depending upon the exact chemical composition, the family of stainless steels can be broadly classified to be the following: (i) Austenitic Stainless steels, (ii) Ferritic Stainless Steels, (iii) Martensitic Stainless Steels, (iv) Duplex Stainless steels, and (v) Precipitation hardening stainless steels [3].

An Experimental Study on Partial Replacement of Cement by Various Percentages of Phosphogypsm in Cement Concrete

R.Swami Ranga Reddy

ABSTRACT: The headway in shape department incited absence of bond in view of which the fee of concrete extended tirelessly. In India, the price of concrete amidst 1995 modified into round Rs. 1.25/kg and in 2018 the fee reached out round unique sports. To struggle the absence of bond and the development in fee of cement beneath the ones conditions the usage of reused robust squanders, rural squanders and float effects like fly burning stays, have an effect on warmer slag, silica rage, rise husk, phosphogypsum, and so on., got here into use. Phosphogypsum is a result in the wet technique for manufacturing of phosphoric damaging (ammonium phosphate excrement) thru the development of sulphuric ruinous on the stone phosphate.

A take a look at examination turn out to be finished to evaluate the effect of phosphogypsum on mechanical homes of bond for M30 Grade. In this paintings bond is uprooted with the aid of 5%,10%,15% and 20% of phosphogypsum. The proper estimations of phosphogypsum is settled relying on the exams drove on cement. Mechanical attributes of Concrete is classified for compressive tremendous, split rigid nature and flexural first rate at severa some time 7 days, 28 days and 90 days.

The outcomes uncovered that Workability of the solid have become certainly dwindled with boom in the rate substitution of bond thru using phosphogypsum. The idea of bond is broadened upto 10% abrogating of concrete with phosphogypsum.

Watchwords: Phosphogypsum Concrete; ordinary Curing; Mechanical homes.

INTRODUCTION

With the improvement of age and enlarged a territory programming utilization of security and mortars the quality, accommodation, robustness and restrictive movements of the standard cement is consistently supporting methodology changes according to make it continuously observable reasonable for any condition. The headway in foundation locale showed for the most part nonattendance of bond in view of which the charge of concrete conceded reliably. In India, the rate of bond in some unspecified time later on of 1995 have wound up being round Rs. 1.25/kg and in 2015 the rate deferred around 6 models. As a way to deal with battle the absence of bond and the expansion in expense of cement underneath those occasions the use of reused solid squanders, green squanders, and current through method for things like fly intensely hot remains, influence hotter slag,

silica seethe, rise husk, phosphogypsum, and masses of others., met up into utilization. The utilization of above said squander things with bond in inadequate wholes changing concrete cleared a condition for

- ☐ modifying the homes of the solid,
- ☐ Controlling the solid age cost,
- ☐ to triumph over the absence of bond, and over the long haul
- ☐ The captivating trade of business office squanders.

The utilization of unequivocal waste thing might be fiscally boundless reliably on the locale of adequate accessibility and social event. A splendid strategy of the forming is to be had on the use of fly sediment, influence hotter slag, silica rage, upward push husk, etc. In progress of bond concrete. Notwithstanding, the organization on the utilization of phosphogypsum being created business experience is inside the developing stage. This endeavor endeavors to attestation on the use of phosphogypsum in for the most part substitute of bond in cement.

1.1 utilization of business squanders

As India is a making nation the business expansion is quickly developing, in the meantime there's progress in advancement of orchestrated business squanders. Those are making issues in land trade, transportation and ordinary degradation, so there might be have to test to reuse the greater part of the affiliation squanders. Different analysts were by then affected organizing frameworks to utilize the financial squanders.

Option of people, making urbanization, and rising necessities of dwelling in context on inventive updates have added to progression the extent of a spread of stable squanders conveyed through huge business, mining, neighborhood and plant redirections. All around, the anticipated proportion of momentous squanders age end up 12 billion segments in the year 2010 (Yoshizawa, 2010). The total, 10 billion wealth have been mechanical endeavor strong squanders and 1.6 billion hundreds were conscious outrageous squanders and one-of-a-type squander is zero.Four billion tone. Roughly 19 billion stores of solid squanders are anticipated to be conveyed yearly through technique for the yr 2025 (Yoshizawa, 2010). Yearly, Asia free from some other individual produces four.Four billion masses of stable squanders. About 6% of this aggregate is

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GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES
A STUDY ON STRENGTH PROPERTIES OF FLY-ASH BASED GEOPOLYMER CONCRETE USING GGBS

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ABSTRACT
Concrete is one of the most widely used construction material all over the globe. Portland cement production is a major contributor to carbon dioxide emissions caused to global warming, many efforts are being made in order to reduce the use of portland cement in concrete. The world is facing the challenge of global warming and climate changes due to carbon dioxide greenhouse gases and increment of carbon foot print. To minimise the effect of global warming, the geopolymer technology could help in reducing the carbondioxide emissions. Introducing geopolymer materials not only will help in environmental issues but also for reduction of carbon dioxide emission caused by the 80 % to 90 % arise due to production of cement. The absence of cement in geopolymer mixtures is a gifted property and many researchers believe that the geopolymer concrete will be the future concrete. In this paper, the efforts were made to study the different strength properties of geo-polymer concrete with different percentage replacement of Ground Granulated Blast Furnace Slag (GGBS) and Fly-Ash and also to evaluate the optimum mix proportion of geo-polymer concrete with fly-ash replaced in various percentages by GGBS.

Keywords: Geopolymer concrete, sodium silicate, sodium hydroxide, fly ash, compressive strength, split tensile strength, and flexural strength.

I.   INTRODUCTION

Ground Granulated Blast Furnace Slag (GGBS) and Fly-Ash:
Cement production contributes significant amount of greenhouse gas, because the production of one ton of portland cement also releases about one tone of CO_2 gas in to the atmosphere. In such cases alternatively utilization of supplementary cementation materials is well accepted and these materials replace the by weight of cement without sacrificing the original properties of concrete.

Ground granulated blast furnace slag is obtained by quenching molten iron slag (a by-product of iron and steel making)from a blast furnace in water (or) steam to produce a glassy, granulated product that is then dried and ground into a fine powder. The met kaolin (MK) or calcined kaolin, other type of pozzolan, produced by calcination has the capacity to replace silica fume as an alternative material. In overall view of the global sustainable development, it is imperative that supplementary cementing materials should be used to replace large proportions of cement in the construction industry.

Blast furnace slag is a by-product of iron manufacturing industry. Iron ore, coke and limestone are fed into the furnace, and the resulting molten slag floats above the molten iron at a temperature of about 1500ºC to 1600ºC. The molten slag has a composition of 30% to 40% silicon dioxide (SiO_2) and approximately 40% CaO, which is close to the chemical composition of Portland cement. After molten iron is tapped off, the remaining molten slag, which mainly consists of siliceous and aluminous residues, is then rapidly water- quenched, resulting in the formation of a glassy granulate. This glassy granulate is dried and ground to the required size which is known as ground granulated blast furnace slag (GGBS).

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A . wKSh Ch i l R dn,Rl 1 HCFl Hyl v Cm&l RhRl S A 22H 2dvl r ChRH wl Ph 1 dHyd &l F dRl   l nwCmu,nl d22H 2dvl M,w 1 ChS dv   . wChl SKvw

1 a dHyv e K dH   dvKSl yd &dC

bc2 nb m H   Avv vbPhb- uC, vvCu

s EPub   nbC, D d Hn. n un. D P bPnTP o PuPb Mlvbbcb C,   l nC C. T y T2 uPi P2

Abstract - Demolition of old and deteriorated buildings and traffic infrastructure, and their substitution with new ones, is a frequent phenomenon today in a large part of the world. The main reasons for this are structural deterioration, natural disasters (earthquake, fire and flood), etc. Crushing concrete to produce coarse aggregate for the production of new concrete is one common means for achieving an eco-friendlier concrete in addition to the reduction in valuable landfill space and savings in natural resources. In order to promote the reuse of construction waste, it is necessary to ensure that,1) Assurance of safety and quality, 2) Durability / environmental impact and 3) Cost effectiveness of construction. In the present study an attempt is made to find the optimum percentage replacement of fine aggregate with Pond ash & Stone dust in Recycled Aggregate Concrete & conventional concrete of M20 grade, in accordance with the workability and quality point of view. Recycled aggregate content has been fixed to 30%. Pond ash content has been varied in 0%, 20%, 30% and Stone dust content has been varied in 30%, 70%, 80% as replacement for fine aggregate. Cubes, cylinders and prisms were casted and strengths are determined for 28 & 56 days. An investigation into the properties of RAC like workability, compressive strength, split tensile strength and Flexural Strength is made. Results obtained shows that Optimum replacement of Natural fine aggregate is 70% with Stone dust and 30% with Pond ash in 30% recycled coarse aggregate concrete. Thus they can be replaced for all the works under M20 concrete.

Keywords: Recycled Aggregate Concrete, Pond Ash, Stone dust, Compressive Strength, Split Tensile Strength, Flexural Strength.

Rooftop Rainwater Harvesting – A case study

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Abstract

During the last few years, India has witnessed a decline in surface water effected the use of flow irrigation and the rise of a groundwater drafting through private tube wells increased drastically. During past few years climate change has become as a force multiplier in dropping groundwater levels further. Hence there is a serious need of groundwater recharge in replenishing the aquifer. In some parts of India, due to over-exploitation of groundwater, decline in groundwater levels resulting intrusion of saline water in coastal areas and land subsidence have been observed. Usage of groundwater arose because of dip in normal rainfall and changes in government policies like free supply of electricity to farmers etc. Hence groundwater has become critical and threatened. There is need for artificial recharge of groundwater, conserve rainfall water i.e. water harvesting should be done wherever it is possible. Micro Water harvesting may be adopted by city dwellers, farmers in villages, and institutions level. The choice of a particular method is governed by local topographical, geological and soil conditions; the quantity and quality of water available for recharge; and the technological-economic viability and social acceptability. This paper discusses water harvesting at educational institution level.

Keywords: *groundwater, depletion, land subsidence, groundwater harvesting, recharge, rainfall, drafting.*

1. Introduction

Rain water harvesting (RWH) aims to augment ground water reservoir by modifying the natural movement and directing surface water to a suitable location where RWH pit is constructed. RWH techniques will address enhancing the sustainable yield in areas where over-development has depleted the aquifer. RWH conserves surface water runoff during monsoon, reduce soil erosion, preventing runoff from going into sewer or storm drains and reduce the water load on treatment plants, makes ecological and financial sense not to waste a pure natural resource available in large quantity. The increasing demand for water specifically in urban areas has increased awareness towards the use of RWH to augment ground water supplies. It is stated simply, RWH is a process by which excess surface-water is directed into the ground through a rain water pit interface. The RWH system for collection and reuse has to be constructed with

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M.V. KRISHNA RAO, P. RATHISH KUMAR,
T. SESHADRI SEKHAR

Abstract

This paper addresses the effect of sodium hydroxide concentration and curing type on strength and durability characteristics of low calcium fly ash-based Geo Polymer Concrete (GPC). Test results indicate that the workability decreased and strength improved with increasing concentration of NaOH in Geo Polymer Concrete specimens. Hot oven cured concrete specimens exhibited better compressive strength as compared to those of ambient curing. Exposure of Geo Polymer Concrete specimens to acidic and sulphate environments suffered loss of weight and compressive strength up to 3.5% and 14% respectively. Results signified that hot oven cured Geo Polymer Concrete is highly resistant to water sorption, chloride ion penetration, and also to acid and sulphate attacks.

Keywords: Alternate cementitious system (ACM), Ambient curing, Alkali activated binder, Compressive strength, Durability, Sorpitivity.

1. INTRODUCTION

The cement industry is liable for 6% of CO_2 release into the atmosphere. To develop a eco-friendly concrete, Davidovits[1,2] produced a binder called Geo-polymer, an alkali activated Alternate Cementitious System (ACM) which is an inorganic alumina silicate powder obtained by a polymeric reaction of alkaline liquid with silicon and aluminum in source materials of geological origin or by-product materials such as fly ash, silica fume, granulated blast furnace slag, rice husk ash and metakaolin. The silicon and the aluminium in fly ash react with an alkaline liquid which is a combination of sodium silicate and sodium hydroxide solutions to form the geo-polymer paste, due to Polymerization process. Water is released during "Polymerization" reaction and this water, expelled from the geo-polymer matrix during the curing and further drying periods, leaves behind discontinuous nano-pores in the matrix. Thus, the water in a geo-polymer mixture plays no role in the chemical reaction except for workability during handling, in contrast to the hydration process in OPC based concretes [3]. Palomo et al.[4], reported that curing temperature acts as an accelerator in fly ash-based geopolymers while higher curing temperature and longer curing time results in higher compressive strength. Hardjito et al. [5] & Hardjito and Rangan [6], reported that commercially available Naphthalene-based superplasticizer can be used up to 2% by mass of fly ash to improve the workability of Geo Polymer Concrete without resulting in any segregation and degradation in the compressive strength. Kovalchuk, et al. and Jimenez et al. [7, 8] observed that curing in covered moulds yields a very dense, primarily amorphous microstructure with an excellent mechanical strength up to 102 MPa. Van Chanh et al.[9], reported that the compressive strength of fly ash-based GPC increases with increasing curing temperature in the range of 60°C to 90°C. Patankar et al.[10], concluded that both workability and compressive strength increase with increase in concentration of sodium hydroxide solution for all solution-to-fly ash ratios, with degree of heating accelerating the strength for a test period of 3 days. Olivia, et al.[11], reported that GPC exhibits low water absorption and sorptivity. Reddy et al. and Wallah [12, 13] have reported that GPC has excellent resistance to chloride attack and sulphate attack. Sanni and Khadiranaikar [14, 15], assessed the durability of GPC specimens by immersing them in 10% sulphuric acid and 10% magnesium sulphate solutions separately. They also studied permeability characteristics through Rapid Chloride Penetration Test (RCPT) and observed that geopolymer concrete allowed 1560 to 1980 Coulomb in 6 hours, giving low rating as per ASTM C 1202 – 97 [16]. Okoye et. al [17] studied the effect of silica fume on durability properties of fly ash based geopolymer concrete and revealed that GPC incorporating silica fume has significantly higher resistance, in sulphuric acid and chloride solutions, than that of the control mix cast as M40. Singh et. al [18] presented an overview of geo-polymers formed by the alkaline activation of aluminosilicates and concluded that geo-polymer concrete possess comparative properties to that of OPC concrete that

HARIKRISHNA DAMERA,
N.R. DAKSHINA MURTHY,
N.V. RAMANA RAO

Abstract

Sustainability in the construction industry can be accomplished by adapting sustainable practices ensuring ecological harmony. Using recycled aggregates and fly ash has been emerging as one of the sustainable practice for responsible consumption of waste and converting it into wealth by utilising them in producing concrete. Deterioration of concrete members exposed to aggressive acid environments is a key durability issue that affects the life cycle performance and economy of civil infrastructures. Groundwater, chemical waste, sulphate and chloride bearing compounds in earthfill, acid rain in industrial zones and biogenic acid in sewer systems are the main sources of acid affecting concrete structures. Addressing these concerns, this present study aims at exploring the effects of Recycled Coarse Aggregate (RCA) and fly ash on durability characteristics of concretes, when exposed to severe acidic environment. The parameters considered were weight loss and strength loss, when exposed to 5% concentrated HCl acid and 5% concentrated H_2SO_4 acid. It was found that replacement of Natural Coarse Aggregate (NCA) with RCA and cement with fly ash showed a way of considering economy and environmental effects as criteria, given a little bit of compromise towards strength and durability but still falling well within an acceptable limit. The RCA used in this study was unprocessed, washed with water to remove impurities.

Keywords: Blended concrete, compressive strength, fly ash, recycled aggregate, strength loss, weight loss.

1. INTRODUCTION

In pursuit of reducing the environmental impact in terms of energy consumption, pollution, industrial waste disposal and global warming, many researchers are striving for alternate concrete making materials. Blended concretes can substitute in order to address these issues. The present research exploited the possibility of producing blended concretes with fly ash and recycled aggregates. It was found that most of the desired strength could be achieved with 25% replacement of cement with fly ash and 75% of natural coarse aggregate (NCA) with recycled coarse aggregate(RCA). Blended concretes were produced by partially replacing the cement by 25% fly ash and the natural coarse aggregates were replaced by recycled coarse aggregate in different fractions of 0,25,50,75 and 100 percentages.

Many researchers have reported that there are some disadvantages (higher water absorption, lower resistance to acid attack, sulfate attack and chloride ion penetration) in using RCA in concrete as partial replacement compared with Natural Aggregate Concrete (NAC). However, these characteristics can be improved by incorporating admixtures such as fly ash into the Recycled Aggregate Concrete (RAC) [2].

Mechanical properties of hardened concrete are significantly affected by the environmental conditions to which the concrete is exposed during its service life [3]. Sulphuric acid in groundwater, chemical waste generated from the oxidation of sulphur bearing compounds such as pyrite in backfill, acid rain of which sulphuric acid is a chief component and biogenic sulphuric acid in sewage systems can attack substructure concrete members and can cause considerable damage by corrosion. When concrete is exposed to sulphuric acid three main chemical reactions occur viz. (i) Gypsum formation resulting from conversion of the calcium hydroxide $Ca(OH)_2$ to calcium sulphate ($CaSO_4$), (ii) Ettringite formation which is due to conversion of hydrated calcium aluminate to calcium sulpho aluminate, (iii) Decalcification – decomposition of the hydrated calcium silicates (C-S-H), which is responsible for provision of the strength in concrete [4]. These chemical reactions lead to expansion, cracking and loss of strength and elastic properties of concrete.

Use of fly ash based recycled aggregate concrete has been emerging as one of the sustainable practices for responsible consumption of waste and converting it into wealth by utilizing

Experimental Studies on the Effect of Liquid Nitrogen cooling on the Machining Forces for Machining of Mild steel and Tool steel specimens

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1.0 INTRODUCTION

The cutting conditions in metal cutting can be improved by the use of cutting fluids, acting both as a coolant and a lubricant. Different types of cooling methods are used to overcome temperature rise. Among them, the use of emulsion fluid is the most popular cooling method, mainly because of economy and ease of use. However, the main problem with the coolant is that it doesn't reach the real area. They fail to reduce temperature in cutting zone because they cannot penetrate proper into the tool chip interface. Therefore, the extensive heat generated from the tool chip interface evaporates the coolant before it reaches the cutting area. Hence heat generated during machining is not removed and is one of the main cause of the reduction in tool life. The tool failure, poor surface finish and less dimensional accuracy are associated due to this high cutting temperature in cutting zone. Further conventional fluid also creates environmental and disposal problems. Therefore to overcome this problems, a new cooling approach is investigated i.e., cryogenic cooling, in which the liquid nitrogen (LN2) is used as a cutting fluid in the machining operation. This work especially, focusses on the effect of cryogenic coolants on machining characteristics. Earlier, much work is investigated using LN2 as the coolant to reduce cutting temperature, tool wear, surface roughness and cutting forces-Bartley firstly investigated the cryogenic machining using liquid CO2 as the coolant in the year 1953. Dhar and kamaruzzaman discussed the beneficial effects of cryogenic cooling in machining, they conduct an experiment on cryogenic cooling and proved that the cryogenic cooling helps to reduce the cutting temperature in tool work interface and maintain the cutting edge sharp, which results in better tool life, surface finish and higher dimensional accuracy as compared to dry and wet machining. The major disadvantage of using LN2 is that it increases the overall machining cost and it precools the workpiece, which increases the workpiece hardness of material during machining. This results into increases the cutting forces and abrasion to the tool. To eliminate this problem, the LN2 is prevent from workpiece and only directly applied on the tool rake face.

In this present work, a new type of cooling approach is used i.e. cryogenic machining in which the liquid nitrogen is used as a coolant. The experiment investigation done by Hongshane et.al [1] on cryogenic cooling of titanium alloy Ti-6Al-4V. The study finds that the combination of these two micro nozzles provide the most effective cooling while using liquid nitrogen flow rate. Their work shows that tool life increases up to 5 times the state of the machining Kamruzzman et.al [2] studied on the effect of high pressure

coolant jet in machining of 42Cr Mo4 steel by uncoated carbide inserts. They have dealt with an experimental investigation on the effect of high pressure coolant on temperature, tool wear, surface roughness and dimensional deviation. Nalbant Muammer et.al [3]   studied on Effect of cryogenic cooling in milling process of AISI 304 stainless steel. The effects of cryogenic cooling on cutting forces in the milling process of AISI 304 stainless steel were investigated. Cryogenic cooling and cutting speed are found to be effective on cutting forces. Cutting forces and torque in cryogenic milling are higher than those in dry milling. Cutting force is increased as the cutting speed is increased. Sancheza L [4] studied on a Cryogenic machining as an alternative turning process of normalized and hardened AISI 52100 bearing steel. This article presents the results of turning hardened and normalized bearing steel AISI 52100 (DIN 100Cr6), comparing conventional flood and dry with cryogenic machining .Turning results show drastic improvements in tool lifetime (up to 370%) for cryogenic machining of normalized bearing steel 100Cr6 and reduction of thermal residual stress inducements in case of hardened bearing steel 100Cr6, while tool life is also extended. Bermingham, 2011 studied on new observations on tool life, cutting forces and chip morphology in cryogenic machining Ti-6Al-4V. Liquid nitrogen is a safe, clean, non-toxic coolant that requires no expensive disposal and can substantially improve tool life. Cryogenic coolant is effective in extracting heat from the cutting zone [5-6]. As many have reported, cryogenic cooling has great technological and economic potential. Some state that technique is profitable compared to more common cooling methods while others have doubts. Every case is individual and needs to be analyzed separately. The success of applying cryogenic cooling is highly depending on many parameters such as workpiece material, cutting tool material, the design of the tool and process parameters. In machining processes of hard-to-machine materials, usually the cooling is aimed directly to the cutting zone while for ductile material the cooling is sometimes directed to the material. The great majority of presented and reported results about machining cryogenic cooling have been positive in terms of tool life, wear development and surface finish.

2. EXPERIMENTAL DETAILS

The Test pieces of Mild Steel and Tool Steel with 30mm diameter and 200 mm length are selected for the experimental investigation. Experiments are carried out on an HMT lathe shown in Fig 1, under dry and cryogenic cooling conditions.

ANALYTICAL AND NUMERICAL APPROACH TO VIBRATION ANALYSIS

OF LIQUID FILLED ALUMINUM THINCYLINDRICAL SHELLS

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ABSTRACT

Vibration behavior of empty and variable fluid levels, contained in aluminum cylindrical shells of 2mm and 3mm subjected to horizontal accelerations are considered. Mathematical expressions, which show the motion of cylinder were developed and modified by use of small amplitude wave approximations, enabling equations for the various modes of vibrations and natural frequencies to be obtained [11]. The expression for frequency is formulated by the consideration of fluid in the cylindrical shell. The results were compared by considering modal analysis of aluminum shells, modeled and analyzed using ANSYS. Natural frequencies for different mode shapes are developed for both 2mm and 3mm aluminum shells of empty and with variable water column from the base of the shell. Damping ratios were calculated using half power method. Natural frequencies predicted from analytical method correlated with ANSYS, were found to be in close agreement.

KEYWORDS: *Thin Shells, Natural Frequency & Damping Ratio*

<div style="text-align: right">*Original Article*</div>

1. INTRODUCTION

In the recent times, the behavior of storage tanks that carry liquid has got special attention because of vulnerability effects of storage tanks due to earthquakes, as they caused liquid spill out due to structural failure, environmental effects and leakages, all these are potential losses to the nation. To reduce these effects due to winds and seismic excitations, storage tanks are proposed to have mass dampers. In this regard, number of works was carried by several researchers, who studied dynamic nature of storage tanks carrying liquids. Most of the works fluid mass is added to the structure of the tanks, the dynamic behavior characteristics are obtained with analytical approaches by considering simplified geometries and boundary conditions. Some of the earlier works are as follows.

Kubenko and Koval'chuk (2009)[3]observed in their analytical and experimental work that, shells with damping models subjected to axial and combined loads, there is big gap in the dynamic behavior, mainly because of geometric imperfections.

Mallon et al 2010[5] used Donnell's nonlinear shell theory in his analytical work, for the study of cylindrical shell with orthotropic material for multimode expansion to discretize PDE to ODE. In this theoretical work, shell and electromechanical shaker interaction was considered in the model. They also carried out experimental work. There is small gap between experimental and analytical study.

THE DESIGN AND FABRICATION OF A COMPOUND DIE TO

MAKE HEXAGONAL WASHER

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ABSTRACT

Many parts and components used in mechanical industry are manufactured by cold pressing operations. Die is the main tool in these operations. There are different types of dies like progressive die, compound die and combination die.

This paper presents design and fabrication of a compound die which combines blanking and piercing operations. Design and development of compound die is one of the important phases in sheet metal working. The small error in the design can result in heavy manufacturing losses through die failure, part geometry distortion and production risk. Assembly of all the die elements is another task where use of accurate measuring instruments for alignment of various tool elements is important. In the present work, a compound die for production of a hexagonal washer of M15 bolt has been designed and developed. The 2D modelling of the compound die has been done using solid works software. This press tool has been tried out on a fly press. The components produced are to the required dimensions.

KEYWORDS: Cold Pressing, Progressive Die, Compound Die, Combination Die, Blanking, Piercing, Solid works & Fly Press

Original Article

INTRODUCTION

Sheet metal working is an important manufacturing process for many industries producing kitchen utensils, home appliances, electronics, automobiles, toys, furniture etc. Most of these products have sheet metal casings that are made by cutting and forming the sheet metal. Some of the basic sheet metal operations are blanking, punching (Piercing), drawing and bending.

Blanking is a cutting process in which a piece of sheet metal is removed from a larger piece of stock by applying required shearing force. In this process, the piece removed, called the blank, is not scrap but rather the desired part. Blanking can be used to cutout parts in almost any 2D shape, but is most commonly used to cut work pieces with simple geometries that will be further shaped in subsequent processes. Punching is a process in which the punch removes a portion of material from the larger piece or a strip of sheet metal. If the small removed piece is discarded, the operation is called punching, Figure1 shows difference between blanking and piercing,

EXPERIMENTAL INVESTIGATION OF SPRING BACK AND WRINKLING PHENOMENA IN SQUARE PIPES DURING BENDING

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ABSTRACT

Bending operation is one of the crucial steps in producing a variety of industrial products. The objective of this work is to design and fabricate a pipe bending die for making square shaped pipes. Design of the die is done in such a way that it can replace the circular pipe bending die in the metal forming lab of CBIT. This increases the utility of the machine and helps to calculate the bending load, spring back and wrinkling effect for a given size and thickness of square pipe. In this work, an attempt is made to investigate the effect of bend angle on spring back by varying the thickness of square pipe. Also, an effort is made to reduce the wrinkling effect occurring in square pipes during bending process. The studies reveal that spring back increases with increase in bend angle and with increase in pipe thickness spring back decreases.

KEYWORDS: Pipe Bending, Spring Back, Bending Die & Square Pipe

1. INTRODUCTION TO BENDING PROCESS

Tube bending process is a metal forming process, in which, a tube is bent into required radius known as bend radius. Tube bending process has wide range of applications in the field of automobiles, aircrafts and structural constructions. They are also widely used in furniture. The total load in bending process consists of frictional forces and the ideal bending load. The tube that is to be bent is fixed by a vice clamp comprising of two pressure dies. The bending process in the machine take place by a hydraulically assisted rotary table, which pushes the fixed tube into fixed die by rotary action.

1.1. Types of Tube Bending Processes

Bending process involves the change in shape of the tube without any additional material being added. Different bending machines are used to get different types of bends. The various types of bending operations are discussed below.

1.1.1. U- Bending

In this type of bending process, the bending is done up to 180 degrees. Figure 1(a) shows the U-bending process.

1.1.2. Circular Bending

The process in which, a pipe of any cross section is bent to form a complete circle consisting of three or more roller dies is called as circular bending. The applications of products obtained from this process are wheels, rims etc. Figure 1(b) shows the circular bending process.

Original Article

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Determination Of Formability Of Bimetallic Sheet Using Forming Limit Diagram

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Abstract

The Formability of a sheet plays an important role in all sheet metal forming operations. It is required to determine the formability of sheet to know the behavior of the sheet under various loading conditions. By determining the formability, it will be easier to predict the failure point of a sheet metal. Further it suggests us the maximum permissible value of load to be applied on the sheet material so that it will not fail. Forming Limit Diagram is a graphical way of depicting the forming behaviour of a sheet metal. FLD estimates various regions of sheet metal of plastic deformation and suggests a permissible value of load to be applied. However FLD of Aluminium, MS, Copper etc are known from the record books but FLD for bimetallic sheet is not yet determined. Bimetal refers to an object that is composed of two separate metals joined together. Instead of being a mixture of two or more metals, like alloys, bi-metallic objects consist of layers of different metals. Generally, these bimetals are used for thermal applications like the thermostat, thermocouple and other electrical devices which need circuit breakers. But these bi-metallic sheets have better strength, thermal resistance and ductility than the singular sheet metal. Hence, the aim of this work is to determine whether these bi-metallic sheets are suitable for deep drawing operation or not. This can be determined by finding out the formability of these sheets. The main objective of this work is to draw the Forming Limit Diagram of bimetallic sheet made of Aluminium and Copper and to find the formability of the sheet. To achieve this objective the strength of the bimetallic sheet is determined first and then Chemical Etching of the bimetallic sheet is done which creates a grid pattern of circles on the surface of the sheet. The sheet is then cut into different widths by keeping the height of the specimen constant. Erichsen cupping test is performed for different widths of bimetallic strips. During the experimental process the sheet is initially fixed between die and punch. Then the punch is made to advance through specimens until a fine hair line fracture appears. The circles on the surface of the sheet will be deformed into ellipse. Deep drawing is carried out for the same bimetallic sheet where the blank of the bimetallic sheet is drawn into cup. The major and minor axes of the ellipse which corresponds to major and minor strains are measured. The strains are measured along different portions of the cup namely flange portion, side walls and the base of the cup and this is included in the Forming Limit Diagram of Bimetallic sheet. By taking major strain on Y-axis and minor strain on X-axis, a curve is obtained which is called as Forming Limit curve or Forming Limit Diagram.

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Keywords: Al-Mg alloy;low cycle fatigue;Chaboche model;stepped aging heat treatment

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Estimation of interlaminar shear strength in glass epoxy composites by experimental and finite element method

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Abstract. The objective of the present work is to estimate interlaminar shear strength in glass epoxy composite by experimental and finite element method. A woven glass fabric (0°- 90°) and epoxy are used in the preparation of the composite. Interlaminar shear strength (ILSS) is estimated experimentally by ASTM D 2344 and ASTM C 1425 for thin and thick laminates. While adopting the procedure mentioned in ASTM D 2344, the sample dimensions of thin and thick laminate are 32 X 10 X 2 mm^3 and 80 X 10 X 10 mm^3 respectively. Three-point bend test is conducted on Universal testing machine made by United Calibration Corporation with model No. STM 50 kN at a loading rate of 1.5 mm/minute. For the standard ASTM C 1425, the sample dimensions of thin and thick laminate are 30 X 15 X 2 mm^3 and 30 X 15 X 10mm^3 respectively. The fixture is fabricated for both thick and thin laminate for estimating interlaminar shear strength. The obtained experimental results are compared with interlaminar shear strength estimated in ANSYS, and the correctness of finite element analysis is verified. The results interpreted in the present work are also compared with the published results available in the literature, and it is noticed that the deviation is agreeable. From the available literature, it is also suggested that ASTM C 1425 is recommended over the other methods since the sustainability of the material is achieved while examining the interlaminar shear strength.

1. Introduction and Literature Review

Laminated fibre reinforced polymer matrix composite materials find successful applications in the field of aerospace, automobile, marine, military, etc., because of their directional strength and stiffness. Manufacturing methods of producing composites limit the fibres in the thickness direction to uphold the transverse load which affects the ILSS property of the composites [1]. The interlaminar shear stresses may be caused due to different reasons, one of which is the material property between the layers and out-of-plane stress σ_z, τ_{xz}, and τ_{yz} defined at the interface between layers in a laminated composite material [2]. The interlaminar shear stresses play important role in the failure strength of composite laminate [3]. It can shear apart the interface in the corresponding directions.

ZhihangFanMichael et al,[4] examined the distribution of interlaminar shear strength (ILSS) in neat resin and CNT reinforced epoxy resin. The results showed that the introduction of MWCNT into the composite increased the ILSS by 33%. Mahesh Chandrashekhar Swamy et al [5] examined the influence of fibre orientation on ILSS properties of bidirectional laminated glass fiber specimens. The specimens were subjected to bending loads causing shear stress in the structures. The result show that for same thickness, unidirectional glass/epoxy composite laminates have more shear strength over other types of laminates. Mauro Henrique Lapena et al [6] discussed the mechanical properties of Glass epoxy tubes manufactured by filament winding and its ILSS was 36MPa.

Khalil M. Elawadly et al [7] proved that the first ply failure occurs at the neutral axis of the specimen. Interlaminar shear stress is maximum along the neutral axis and failure occurs through the resin or at the interface of resin and fiber. Here, the fibers do not fail. Surendra Kumar M et al [8],

Estimation of ILSS in Neat Resin and CNT Reinforced S Glass Composites by Finite Element Analysis

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Abstract: In literature review, experimental work and finite element analysis was carried out as per ASTM 1425 and ASTM 2344 to understand the distribution of ILSS (interlaminar shear strength) in S glass epoxy composite for thin and thick laminates. Comparison of the ASTM methods is made and ASTM 1425 is recommended since sustainability can be achieved while understanding the properties of the composite. The objective of the present work is to estimate ILSS in CNT (carbon nanotube) reinforced S glass epoxy composites by finite element analysis.

Key words: ILSS, S glass epoxy, CNT, ANSYS.

Nomenclature

ILSS: Interlaminar shear strength
CNT: Carbon nanotube
ISM: Instantaneous shear modulus

1. Introduction

A composite material is formed when two or more materials are combined to obtain better properties than the individual components. The individual components are reinforcement and matrix. High strength and stiffness, combined with low density, allowing for a weight reduction in finished part is the main advantage in composite materials. For exterior and interior fixtures with variety of styles, textures, shapes in new buildings or restorative projects, GFRC (glass fiber reinforced composite) is used [1].

S-glass has a composition of SiO_2 65 wt%, Al_2O_3 25 wt%, MgO 10 wt%. Other materials may also be present at impurity levels. Epoxy resins are polymeric or semi-polymeric materials, and as such rarely exist as pure substances, since variable chain length results from the polymerisation reaction used to produce them.

Several mathematical models are developed over years to predict the properties of composites [2]. Failure theories were proposed by Hinton and Soden [3, 4] in 1998. Soden et al. [5] and Chamis et al. [6] theory performed well to predict the ILSS (interlaminar shear strength) for unidirectional continuous fiber reinforced polymer. Murthy and Chamis [7] and Huang et al. [8] suggested micromechanical theory illustrated in Hinton and Soden's study. CNF (carbon nano fiber) reinforced GFRC showed high value of ILSS [9] due to improvement in the bond strength between fiber, matrix and CNT (carbon nanotube). Twenty five point four percent (25.4%) increase in the ILSS is observed [10] while adding 0.5 wt% MWCNTs (multi walled carbon nanotubes) and 10 phr n butyl glycidyl ether for GFRC. Lakshmi [11] predicted the distribution of ILSS in neat resin and CNT reinforced carbon epoxy composite as per ASTM 1425 by experimental method for thin laminate. For 120% increase in the applied load, ILSS enhanced by 87% upon adding 1 wt% of amine functionalized long length multi walled nanotube.

In literature review, the distribution of ILSS was estimated by experimental method and finite element analysis as per ASTM 1425 for S glass epoxy

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A SHORT REVIEW ON CONSTITUTIVE MODELLING OF

THE SHAPE MEMORY ALLOYS-1

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ABSTRACT

Shape memory alloys (SMAs) received significant attention by biomedical, aerospace and automotive industries due to their captivating properties called shape memory effect (SME) and Pseudo elasticity. However, the applications of these alloys are mostly found to be biocompatible, and are very sensitive to aerospace and automotive applications. This realization of developing the materials amenable to both aerospace and automotive applications along with biomedical applications needs an assignment of developing suitable constitutive model, to understand the behavior of these materials in different environments. As a result, the present paper emphasizes a short review on various constitutive models, cited in the global scientific community allowing to understand the significance of shape memory alloys, and also suggests essential facts required for developing new models.

KEYWORDS: Shape Memory Effect, Pseudo Elasticity, Constitutive Models, Free Energy & Nitinol

Original Article

INTRODUCTION

Recently, SMAs received huge attention by aerospace and automotive industries because of its intriguing properties, say Pseudo elasticity and SME. But, most of these SMAs are constrained to biomedical applications because of their compatibility; hence they cannot be directly integrated with aerospace and automotive industries. These industries require properties like high strength to weight ratio, high thermal resistance and corrosion resistance which requires different processing methodologies unlike those for biomedical industries. Present challenges in processing these alloys received a substantial attention because of unavailability of proper constitutive mechanics to identify the material behavior for different alloying composition. Nonetheless, significant work has been done for various processing methodologies influencing the properties of Nitinol SMA and developed constitutive relations in these aspects. The present section will emphasize few research works performed over the years in deduce the mechanism of these alloys, and also highlights the research gaps identified from the literature review.

REVIEW OF CONSTITUTIVE MODELS

During 1980's, which is the early phases of articulating and modeling of the SME, engineers and scientists found a close analogy with ferroelectric bodies due to the similar hysteretic behavior. As a result, Müller and Wilmanski (1) proposed a macroscopic model to understand the behavior of the hysteresis with ferroelectric bodies. The primary objective of Müller and Wilmanski model is to simulate a body under uniaxial

A REVIEW ON PROCESS PARAMETERS ASSOCIATED WITH CONSTITUTIVE MODELLING OF SHAPE MEMORY ALLOYS-2

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ABSTRACT

In extension to the last review on constitutive models for shape memory alloys (SMAs), we can realize that most of the parameters involved in developing the constitutive model depend on processing techniques and hence the present paper emphasizes this context. A comprehensive literature review from the previous observations will be made available in the present paper along with the research gaps identified for exploring these SMAs towards aerospace and automotive applications.

KEYWORDS: Shape Memory Alloy, Process Parameters & Constitutive Model

INTRODUCTION

Over the last few decades shape memory alloys have become the most trending materials because of its unique properties namely shape memory effect (SME) and pseudo elasticity that ensemble most of the societal challenges. However, many micro, micro-macro, macro constitutive models were developed to understand these materials' behavior. But the present paper emphasizes the influence of processing parameters on Nitinol exhibiting SME. From our previous paper one can realize that most of the micro and macroscale parameters depend upon the processing parameters, hence, emphasize on the processing parameters will be made in the present context. These understandings of processing parameters enable us to choose different manufacturing routes, composition dependence and processing environments influencing the range of super elasticity and SME. This understanding of influence of parameters allow us to develop products amenable to aerospace and automotive applications without altering the property of SME instead improving the strength to weight ratio, range of transition temperatures and corrosion properties.

Multi Stage Transformation (MST)

The traditional basic view of phase transformations in Ni-Ti alloys includes only one-stage cubic austenite (B2) to monoclinic (B19') martensite transformation, however, the influence of cold working associated with high density of dislocations (H. Morawiec, 1995) (Morawiec, Stroz, Goryczka, & Chrobak, 1996) (Morawiec D. C., 2003) and the presence of Ni-rich precipitates in Ni-Ti alloys contribute to a more complex two-stage, three-stage or even four-stage transformations, collectively termed as 'multiple stage transformation' (Carroll, 2004).

Original Article

AN EFFECTIVE COMPREHENSIVE ANALYSIS ON RTM METHOD IN CARBON COMPOSITES MOLDING WITH COMPUTATIONAL FLUID DYNAMICS

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Abstract.

The article centers around mimicking the progression of epoxy gum in infusion form with carbon fiber texture inside. Performed reenactments depended on the way toward assembling composite components utilizing the cutting edge RTM method. RTM method is utilized in the generation of top of the line and sports vehicle parts, and other lightweight items requiring high quality. It comprises of infusing the pitch under tension into a shut form with support. One of the serious issues in this method is giving a satisfactory progression of the sap in infusion shape and a total supersaturation of fortification with a thermosetting gum. These angles depend emphatically on the heading of the filaments in the carbon texture and porosity of the support. Data about the best possible development of the form and impact of fiber direction and porosity can be gotten by numerical reenactments utilizing CFD business programming Moldex3D. The examination depended on the genuine procedure of assembling vehicle reflect covers. Investigation of acquired outcomes concentrated on the effect of changes in process input parameters. Specifically, parameters, for example, the porosity and course of filaments in the fortification were researched. Test outcomes are analyzed regarding the level of fortification supersaturation in the shape. In view of performed tests, proper ends were drawn.

I. Introduction

The composites are utilized in numerous mechanical areas on account of a wide scope of utilizations, yet additionally because of numerous methods created to make and consolidate them [1]. Picking the correct innovation and the correct material in the assembling procedure permits to accomplish fulfilling results [2, 3].

RTM (Resin Transfer Molding) is a method of delivering carbon fiber based composites in a shut form. It comprises of infusing pitch into the pre-masterminded fortification [4] (appeared in the figure 1). The properties of the made segments are firmly impacted by the pitch, fortification and mechanical procedure parameters. Environmental weight, surrounding temperature, contrasts in volume of fortification additionally affect the nature of the last workpiece [5]. Huge number of factors influencing the generation procedure demonstrates the need of utilizing PC reenactments at the phase of readiness of the creation procedure. Reenactments permit to pick the infusion speed and decide the hour of filling the shape. It is likewise essential to mastermind support inside the shape. Lopsided conveyance of fortification in the volume of the composite prompts many negative marvels, for instance not permitting full immersion, or potentially impacting the event of shear focuses on that regularly twist the form [4, 6, 7].

EFFECT OF EGR ON PERFORMANCE OF CI ENGINE WITH DIESEL AND COTTON SEED OIL AS FUELS

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ABSTRACT

Automobile emission is one of the major problems in the environment. Engine emits the carbon monoxide (CO), unburnt hydrocarbon (HC) and smoke density, etc and causing a variety of health and environmental problems at the locations far from their emissions source. These problems include ground level ozone and smog, which are created in the atmosphere. Motor vehicle emissions contributes to air pollution and are a major source in the creation of smog in some large cities. The health risks of air pollution are extremely serious.

In general, an exhaust gas is a gas emitted through a combustion process. The exhaust gas is actually a combination of many different gases; N_2, CO_2, H_2O and O_2. One of the most dangerous is CO, carbon monoxide. This gas has the potential to kill people and animals if concentrations are high enough. Hydrocarbons come from unburned fuel. NO_x are released through the combustion process and have been linked to acid rain and ozone.

One of the ways to reduce the emission from the exhaust gas is Exhaust Gas Re-Circulation (EGR), where certain amount of exhaust gas released out from the exhaust manifold is cooled and directed into the inlet manifold. Complete combustion of fuel leads to minimum emissions. A double pipe, counter flow heat exchanger was designed for this purpose.

The present work deals with the effect of EGR on performance characteristics like specific fuel consumption, brake thermal efficiency and exhaust gas temperature.

The high consumption of diesel fuel not only in agriculture section but also in transport sector compels for the substitution of diesel fuel with suitable alternate fuel. Hence, performance characteristics with diesel and cotton seed oil as fuel in a conventional, unmodified diesel engine with and without EGR are compared in the work.

Experiments were conducted on vertical, 4 stroke, single cylinder (with electric generator) diesel engine with various EGR percentages and without EGR. It was observed that, at 15% EGR with diesel as fuel, engine performance improved and there is very minute effect of varying EGR percentage of cotton seed oil though the performance is relatively good.

KEYWORDS: EGR, Exhaust Manifold, Heat Exchanger, Specific Fuel Consumption, Brake Thermal Efficiency & Exhaust Gas Temperature

Symbol	Name
Q	Rate of heat transfer
m	Mass flow rate
c_p	Specific heat at constant pressure
T	temperature

OPTIMIZATION OF 3D PRINTING PARAMETERS ON SURFACE ROUGHNESS BY TAGUCHI METHOD

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ABSTRACT

Fused Deposition Modeling (FDM) is a type of rapid prototyping technique used in manufacturing prototypes among the additive manufacturing technologies.3D printing is a type of FDM where the prototypes are made layer by layer addition of molten filament material.3D printing directly converts the 3D-CAD data into prototypes(model). Our present involves studying the parameters which affect the surface roughness of 3D printed material are optimized. The material used for deposition is Polylactic Acid (PLA), a common thermoplastic polymer. The parameters like infill density, print speed, printing temperature and wall thickness are varied according to the design of experiments. Taguchi method was adopted to design the experiments and an orthogonal array of L9 (34) is designated and performed to find out the optimal values to minimize the surface roughness of 3D printed PLA material. The surface roughness test is conducted on each specimen as per standards.

KEYWORDS: Fused Deposition Modeling (FDM), Additive Manufacturing, Poly Lactic Acid (PLA), Taguchi Method & Surface Roughness Test

1. INTRODUCTION

In the manufacturing zone, Additive manufacturing a new technology has been proven to be a promising method for adopting in rapid prototyping. This technology substantially has evolved and improved into a useful tool for many fields like in researcher, designing, manufacturing sector. Collaborating different fields in single package molded 3D printer which includes Design, manufacturing, electronics, materials, and business. The classic difference between traditional manufacturing method and 3D printing is, the 3D printer involves additive approach but mostly traditional manufacturing processes involve subtractive approach which includes a combination of cutting, bending, grinding, forging, molding, welding and assembling operations.

Additive Manufacturing (AM), usually known as 3D printing, is defined as the "joining of materials to make an object from 3D model data, generally by layer upon layer, as opposed to formative manufacturing methodologies" according to International Organization for Standardization (ISO)/American Society for Testing and Materials(ASTM) 52900:2015 standard [1].Based on standards, AM processes is classified into seven classes: Binder-Jetting, Material's Extrusion, Powder Bed Fusion, Directed Energy Deposition, Material-Jetting, Sheet Lamination and Vat Photo Polymerization.

2 FUSED DEPOSITION MODELING

Fused Deposition Modeling (FDM) or Fused Filament Fabrication (FFF) is a3D printing material-extrusion process which employs, a continuous distributing of filament of a thermoplastic material which is encouraged from alarge

Investigation of Fracture Parameters of Jute/Glass Reinforced Hybrid Composite and Analysis by Using FEA

Venkata Sushma Chinta, P. Ravinder Reddy, Koorapati Eshwara Prasad and Krishna Sai Vadapally

Abstract These days the interest of people has shifted toward using natural fibers as reinforcement in the preparation of polymer composite material. Having superior properties such as lower density, higher stiffness, better mechanical properties and since the natural fibers are abundantly available, being renewable and biodegradable, the natural fiber-based composite preparation has become a wide area for research activity. This paper deals with the testing and analysis of the single edge notch bend specimen for the estimation of fracture toughness of the material. Six SENB hybrid composite specimens made of glass fibers, jute fibers and epoxy are prepared as per ASTM D-5045. Then, the models of hybrid composite are created in ANSYS to find J-integral and stress intensity factor. The purpose is to retain sufficient mechanical properties by adding layers of glass fiber, at the same time ensuring a lower cost and lower weight by reinforcing intermediate layers of jute fiber in it. Determining the mechanical characteristics of hybrid composite laminate was carried out by three-point bending test so as to compare it with ASTM D-5045 test method's manual. Wherein, the results of the test specimens have satisfied the necessary conditions put forth by the test manual. Mechanical characteristics obtained with hybrid jute reinforced glass laminates enable the substitution of glass fiber by other natural fibers for moderately loaded applications to combine performance and economy.

Keywords Jute/glass fiber · Hybrid composite · SENB · J-integral · Stress intensity factor

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EVALUATION OF INTERLAMINAR FRACTURE TOUGHNESS OF E-GLASS EPOXY COMPOSITE MATERIAL UNDER MODE 1 LOADING

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ABSTRACT

Delamination is one of the major failure modes seen in the laminated polymeric matrix composite (PMC). Accurate prediction of delamination , initiation and propagation is important for the design and analysis of robust composite structures. This paper examines critical load and corresponding displacement of double cantilever beam (DCB) composite specimens made of glass/epoxy of two different layups. Experiments were conducted on these laminates, and the fracture energy, G_{IC} , was evaluated at the crack tip. The applied load-displacement history and crack extension to estimate fracture energy is a requirement. Reduction scheme as Modified Beam Theory is used to calculate the Energy Release Rate. based on cubic and power law are also proposed to determine Young's modulus and energy release rate and found good agreement with the published and test results.

Keywords: *Delamination, Double Cantilever Beam, Fracture Energy Modified Beam Theory, Reduction Scheme .*

1 . INTRODUCTION

Delamination is a failure mechanism in which the laminae separate due to poor inter-laminar fracture toughness and inter-laminar stresses and results in loss in stiffness, loss of strength, and the expected life of material. The critical strain energy release rate is the generally accepted measure of total energy required to initiate a delamination in the material, and is denoted by the symbol G. This value has been found to depend on the mode of delamination which happens in 3 modes-mode1(opening mode),mode 2 (shear),mode3 (tear). Thus there are three G, values: G , G_a, and G_{mc} for mode 1, mode II and mode III respectively. Many aspects of delamination have been studied, including various test methods for different modes, experimental data reduction methods, material effects, environmental effects, and effects of various testing parameters, fiber orientation, stacking sequence, and so on.

ANALYSIS OF AXIAL FLOW FRP FAN BLADE MATERIAL WITH JUTE FIBER REINFORCEMENTS AND INVESTIGATION OF MECHANICAL PROPERTIES

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Abstract - The axial flow fans are widely used for providing the required airflow for heat and mass transfer operations in various industrial equipment and processes. Due dimensional instability of metallic impellers now a day's fan blades are fabricated with glass fiber reinforced plastics (FRP). To reduce the after effects of FRP blades on the environment necessitates the use partial reinforcement of natural fibers in FRP blades. This paper deals with the analysis of FRP blade material with partial jute layer reinforcements and estimation mechanical properties like tensile strength, bending strength by using ANSYS.

Keywords - Axial Flow Fan Blade Material, Fiber Reinforced Plastic (FRP), Jute Fiber, Glass Fiber

I. INTRODUCTION

Composites are one of the most widely used materials because of their versatility to different situations and the relative ease of combination with other materials. Recently there has been a greater inclination towards natural fiber reinforced plastic composites because these are environmental friendly and cost effective to synthetic fiber reinforced composites. Additionally, Natural fibers have lot of advantages over traditional fibers in terms of low cost, low density, biodegradable and easily processed.

They have been received in many industries such as packaging, automobile and construction but natural fibre composites are also finding its way into sport, aerospace, boat and electronic industries too. Rafiquzzaman [1], Sanjay [2] was found that the mechanical properties of the jute/glass composite were close to pure glass specimen and recommended the partial jute reinforcement in place of glass fibers for moderate load bearing applications. MazharulIslam [3] studied on Soil degradation of jute/glass hybrid composite showed moderate degradation and pure glass composite showed very little degradation.
Ali Reza [4] in his study found that FRP is the good structural material for cooling tower blades due to its superior performance in sea water corrosive environment. From the economics point of view though the construction cost is a little higher, could be easily balanced by less maintenance costs of FRP structure considering its higher durability in hostile environments. From literature it is understood that partial reinforcement of glass fibers with jute fibers does not affect the mechanical properties much and soil degradability increases. So, in this work an attempt is made to find the mechanical properties of conventional FRB blade material with partial jute reinforcements by using ANSYS.

II. FRP BLADE MATERIAL

The necessary raw materials for the FRP fan blade include glass fibre in various forms like woven rovings, glass rovings, chopped strand mat, unidirectional glass layers and resin (epoxy), hardener, surface treatment agents etc. All the raw materials are available indigenously.
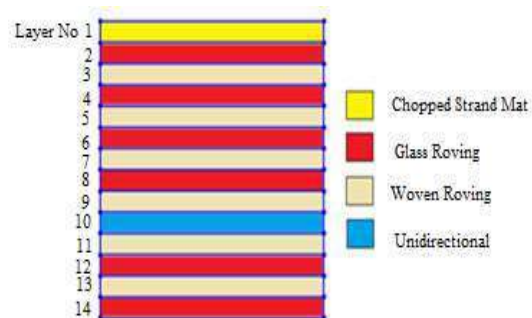
Fig.2.1 Stacking sequence of FRP blade (C0)

In this work the material of 18 feet FRP fan blade (C0) is considered. It consists of 14 layers of glass fibers of different forms with stacking sequence as shown in Fig.2.1.

III. EXPERIMENTATION

Test Specimens are prepared as per IS 1998-1962 [5] standard with material (C0) to find the maximum load at which the specimen fails.

Fig.3.1. Specimen for Tension test (C0)

Experimental Investigation on SI Engine Emissions via EGR and Catalytic Converter with Air Injection Mechanism

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ABSTRACT

Exhaust emissions emitted from spark ignition engines cause air pollution, human health hazards and ecological imbalance. Hence, effective curtail of these is an essential task. For this, an experimental evaluation was carried out on emissions and performance characteristics of the four-stroke three-cylinder Maruthi engine at varied brake power. Three different techniques, initially the exhaust gas recirculation (EGR) system was coupled to the test engine and varied from 0 to 10% for estimation of optimal value. Secondly, the provision of the catalytic converter with the copper as a catalyst and finally by the air injection mechanism of 60 l/m into the catalytic converter is executed and evaluated for optimum emission reduction. Also, the combined effect of these techniques on the characteristics was analysed. From the results, it was found that up to an EGR rate of 5%, an enhancement of 2% in brake thermal efficiency and a reduction of 9.5% in brake specific fuel consumption, 21% in carbon monoxide (CO), 19% in un-burnt hydrocarbon (UHC) and 29% in NOx emissions and a further increase in the EGR rate causes performance deterioration. The NOx emissions decreased by 44% at 7% of EGR. The catalytic converter setup alone decreased CO and UHC by 40% and by application of air injection it was 60%. The CO& UHC emissions decreased by 54% &52% respectively at 7% EGR rate combined with the catalytic converter and air injection mechanism.

Keywords: *SI Engine; EGR; Catalytic Converter; Air Injection.*

THERMAL ANALYSIS OF MODIFIED COMBUSTION CHAMBER OF SPARK IGNITION ENGINE

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ABSTRACT

Efficiency of an internal combustion engine can be increased by increasing the heat energy generation inside the combustion chamber without effecting the performance of l ubricating oil and lessening the strength of the piston. The main aim of this paper is to determine temperature distribution in a four-stroke, single-cylinder, water cooled, variable compression ratio (3-9), variable speed (2200-3000 rpm) spark ignition engine with brake power of 2.2 kW at a speed of 3000 rpm with copper coated combustion chamber (CCE) [copper-(thickness, 300 μ) was coated on piston crown, inner side of liner and cylinder head] and compared the engine, with conventional combustion chamber (CE) with neat gasoline operation. Copper coated power piston, copp.

Keywords: Copper Coating, Piston, Liner, Solid Works, Ansys Workbench, Thermal Analysis.

Control of Pollutants in Supercharged Partially Adiabatic Diesel Engine with Carbureted Methanol and crude Karanja oil blended with DEE

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Abstract

In the present work, Investigations were carried out on Partially Adiabatic Diesel Engine (PADE) consisted of partially stabilized zirconium (PSZ) coating on crown of piston, inner side of liner and cylinder head provided with supercharging in order to compensate the loss of volumetric efficiency with varied injection timing [SOI] and injector opening pressure[IOP]. Pollutants of particulate emissions, nitrogen oxide levels (NO_x) and aldehydes were controlled by supercharging with PADE. Methanol was carbureted through variable jet carburetor installed at inlet manifold of the engine at different percentages on mass basis of crude karanja oil blended with 15% diethyl ether (DEE), which was injected through conventional injection system. Performance evaluation was made with carbureted methanol with injected blended vegetable oil [KO15DE] with supercharging with both versions of the engine with varied injection timing and injection pressure. Supercharging at a pressure of 1.1 bar increased volumetric efficiency, decreased aldehyde emissions, PE's and NO_x levels.

Keywords: Crude vegetable oil; Alcohol; Conventional engine; PADE;Fuel performance; Injection pressure, Super charging, Exhaust Emissions

1.Introduction

There was a demand for diesel fuel with an increase of industrialization of developing countries throughout the world. Replacement of diesel fuel with vegetable oils is causing eco-friendly in nature besides savings in foreign exchange in importing crude petroleum.The substituted fuel should be technically viable, economically suitable, eco-friendly in nature and provide energy security without sacrificing the performance of the engine, and giving lesser quantity of harmful exhaust emissions. Even Rudolf Diesel, who invented the diesel

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EXPERIEMENTAL STUDIES ON OPTIMIZATION OF MOLDING SAND COMPOSITION WITH TAMARIND KERNEL POWDER AS ADDITIVE

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Page : 939-946

Keywords : Dr. G. Laxmaiah; Dr. P. V. R. Ravindra Reddy & Dr. S. Solomonraj;

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1. EXPERIMENTAL INVESTIGATION ON LINSEED OIL METHYL ESTER FUELLED DIESEL ENGINE
2. EXPERIMENTAL INVESTIGATION ON LINSEED OIL METHYL ESTER FUELLED DIESEL ENGINE
3. Experimental Investigation on the Performance Characteristics of a Diesel Engine Fuelled with Linseed Oil Methyl Ester Blends with TiO2 Nanofluid as a Coolant
4. EXPERIMENTAL INVESTIGATION OF PERFORMANCE AND EMISSION ANALYSIS ON DIESEL ENGINE FUELLED WITH KARANJA OIL METHYL ESTER
5. Investigation on the Effects of Antioxidant Additive in A DI-Diesel Engine Fuelled with Calophyllum Inophyllum Methyl Ester Diesel Blend

Abstract

Among all the manufacturing processes, sand casting process still remains as one of the most complex process as it involves heat transfer, fluid flow and so many other things. As the properties of the green sand mix influence the casting defects, the parameters affecting these properties should be identified and controlled precisely. Since, Traditional method of trial-and-error based methods have many disadvantages such as being nonsystematic, time consuming, error-prone and requirement for long durations of experimentation [1], statistical techniques are to be employed. The process parameters that are being varied are clay, water and additive. L-9 orthogonal array is used for experimental design and S/N ratio, and ANOVA are employed to find the optimal process parameter levels and to analyze the effect of these parameters on green compression strength, green shear strength, dry compression strength, dry shear strength, and permeability. Confirmation test with the optimal levels of machining parameters was carried out.

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DESIGN AND ANALYSIS OF FUSELAGE SKIN REPAIR JOINT

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ABSTRACT

In this paper, a dent occurred on a fuselage skin is considered, for which, a repair joint is designed using rivets and is analyzed for static and fatigue loads. Two dimensional model of a joint is taken and the load transfer through the joint is calculated using Patran and Nastran. Then, life of the joint is evaluated by carrying out the fatigue analysis in Ansys. The proposed joint is proved to be satisfactory as far as standards are concerned.

KEYWORDS: Fuselage Skin, Rivets, Patran & Nastran

1. INTRODUCTION

Aircraft, subjected to structural repair / modification needs to be analyzed /evaluated to check the repair /modification in serving the adequate strength to resist the applied loads. The analysis uses static and dynamic loads, which causes fatigue in a structure. Here, a dent on a fuselage skin is analyzed and a repair joint is suggested using rivets. Riveted joints are often the most critical parts, with respect to fatigue life of structures. Therefore, it is important to analyze these components and the forces they are subjected to.

1.1 Pressurization Cycles

Commercial airplanes are pressurized to maintain the comfort level of passengers during flight. The fuselage skin behaves like a thin-walled pressure vessel, such as a balloon. The difference in pressure inside and outside the passenger cabin (ΔP) produces axial and radial tension loads. Membrane or hoop stresses result in the fuselage skin and curved bulkheads. Below figure 1, illustrates the effects of pressure (ΔP) on the fuselage skin.

$$f_{longitidinal} = \frac{(\Delta p)R_{body}}{2t_{skin}}$$

$$f_{\square oop} = \frac{(\Delta p)R_{body}}{2t_{skin}}$$
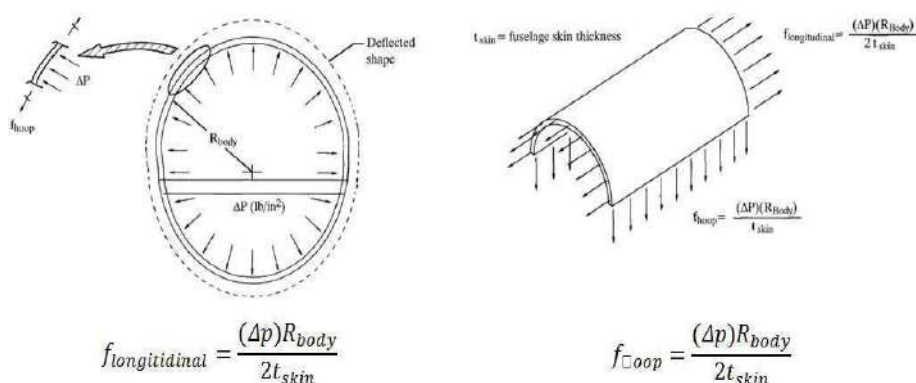
Figure 1: Effect of Pressure on Fuselage Skin

Effect of Air Flow Rate on Performance of Natural Draft Wet Cooling Tower

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ABSTRACT

Cooling tower is an important heat exchanger that is to be used in power plants for efficient working of cycle. Main object of work is to determine the performance of a natural draft wet-cooling tower with various inlet conditions. A commercial tool FLUENT is used to simulate the transport phenomena inside the tower. A 50 tons cooling capacity model has been taken as reference model. The developed model is analyzed with two air flow rates in vertical direction and by combining air inlet temperature and water inlet temperature, the height of the water inlet is increased from the basin height and the same analysis is done by using the two flow rates of air and water into the system. It is observed that the temperature and humidity inside the tower are the main influence factors on the performance of cooling tower. Due to increase in height to an optimum condition the performance of the cooling tower is increased and further increase in the height decreased its performance. Simulation shown that due to temperature of fluid inlet, cooling capacity of the tower has been improved with increase in air airflow rate when compared with natural aspirated air.

Keywords— Cooling tower, CFD, Fluent, Heat exchanger

I. INTRODUCTION

Cooling tower operation is based on evaporative cooling as well as exchange of sensible heat, when warm water comes in contact with cooler air, there is sensible heat transfer whereby the water is cooled. The major quantity heat transfer to the air is through evaporative cooling while only about 25% of the heat transfer is through sensible heat. Figure 1 taken from Mulyandasari [4] shows the schematic of a cooling tower.

According to Hill [6] the factors influencing the performance of a cooling tower are:The cooling range, The approach, The ambient wet bulb temperature, The flow rate of water through the tower, The flow rate of air over the water, The ambient temperature, The type of fill in the tower and Total surface area of contact between water and air

Figure 1 Schematic of a Typical Mechanical Draft Cooling tower

AN EXPERIMENTAL INVESTIGATION OF PERFORMANCE AND
POLLUTION LEVELS ON DI DIESEL ENGINE WITH WASTE
FRIED COOKING OIL AND ITS BIO DIESEL

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ABSTRACT

Alternative fuels research had geared up nowadays and in this connection any fuel that can replace diesel can be a major breakthrough as diesel is being used in transport as well as agricultural sectors. Vegetable oils are treated as alternative fuels for diesel, the reason being their cetane value is nearer to that of diesel and are of renewable in nature. Used cooking oil was collected from various sources and was tested in a 3.68kW Direct Injection (DI) diesel engine at manufacturer specified injection timing and pressure values of 27^0bTDC and 190 bars. The performance parameters along with pollution levels were investigated and compared with pure diesel operation. Used cooking oil had relatively less volatility as well as more viscosity. These problems can be overcome by obtaining biodiesel through a process known as esterification by treating used cooking oil. Experiments were carried out with used cooking oil and its biodiesel at different operating conditions like normal/room temperature (NT) and preheated temperature (PT). Peak brake thermal efficiency (BTE) and Volumetric efficiency (VE) values were found to be higher for pure diesel operation followed by biodiesel and waste fried vegetable oil(WFVO). Biodiesel operation resulted in lower smoke levels and comparable Nitrogen oxide levels(NOₓ)in comparison to diesel operation.

Original Article

INTRODUCTION

The pollution levels are also growing continuously as the number of vehicles is increasing year by year. Diesel fuel is mainly being used in agriculture as well as transportation sectors. Any new fuel with better emission standards that can replace diesel will help in creating a better environment for mankind. India is mostly depending on imports; hence appropriate substitute for diesel fuel also results in foreign exchange savings.

Alcoholic fuels along with vegetable oils are found to be the appropriate alternatives for diesel. The usage of alcohols in diesel engines was not encouraging as their cetane value was comparatively low and at the same time modification of the engine is to be done for better results. On the other hand vegetable oils are found to be a better option because of their cetane value to be nearer to that of diesel.

Methanol, Ethanol and vegetable oils are found to be suitable substitutes for and are also renewable in nature. The calorific value as well as cetane number (40-45) of vegetable (both edible and non edible) oils are nearer to that of pure diesel. Edible grade oils anyhow cannot be used as fuel in engines due to their cost and demand. In the present study used cooking oil or waste fried vegetable oil (WFVO) samples collected from various sources were utilized for experimentation work.

EVALUATION OF PERFORMANCE PARAMETERS AND COMBUSTION CHARACTERISTICS OF A DIESEL ENGINE WITH VEGETABLE OIL OPERATION

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Abstract : As the fossil fuels are fast depleting day by day, the investigations with alternative fuels has been the topic of the highest priority. Non-edible vegetable oils can be used as the alternative fuels in diesel engines as they are not only renewable in nature but also contain comparable cetane number and calorific value of that of diesel fuel. In the present work, the experiments were conducted on the diesel engine, using jatropha oil as the fuel, to evaluate the performance and combustion characteristics. In the present work, the jatropha oil (JO) is used as the alternative fuel for diesel fuel (DF). Experiments were conducted on the diesel engine to evaluate the performance and combustion characteristics with JO operation, at different injection timings and injector opening pressures. The manufacturer's recommended injection timing is 27^0 bTDC (before top dead centre). Study was undertaken to match the injection timing which would bring in improved performance of the engine over that of manufacturer's recommended injection timing. The injection timing was varied from 27^0–34^0 bTDC. The injector opening pressure was varied from 190 bar to 270 bar (in steps of 40 bar). At the recommended injector opening pressure of 190 bar, the optimum injection timing was found to be 31^0 bTDC for diesel operation while it was 32^0 bTDC for JO operation. At the optimum injection timing of 32^0 bTDC, JO operation showed comparable performance when compared with diesel operation at recommended injection timing.

***Key Words* - Jatropha oil, Performance, Combustion characteristics, Injection Timing, Injector opening pressure**

I. INTRODUCTION

Diesel fuel (DF) is consumed in many sectors like transport, agricultural etc. But due to depletion of fossil fuels and fluctuating fuel prices in International Market, there is strong necessity for alternative fuels. Vegetable oils are important substitutes for diesel fuel as they are renewable in nature. Vegetable oils have comparable cetane number (in the range of 40–45) and energy content as of diesel and therefore they can be effectively used in diesel engines.

The use of vegetable oils as diesel fuels dates back to several decades. The vegetable oils have comparable properties with those of diesel fuel. Edible oils cannot be considered as diesel engine fuels due to socio economic restrictions. However, non-edible vegetable oils can be conveniently used in CI engines. The researchers [1-8] conducted experimental investigations on diesel engine using vegetable oil and reported that the engine performance slightly deteriorated, when compared with that of the diesel fuel. On the other hand, the researchers [9-13] reported improvement of engine performance.

Investigations were carried out by various researchers [14-15] on the influence of injection timing on the performance of diesel engine fuelled with vegetable oil. They reported that with the advancing of injection timing, the performance parameters improved.

The researchers [16-18] have studied the influence of injector opening pressure on the performance of DI diesel engine with vegetable oil operation. An increase in injector opening pressure resulted in improved performance.

The present work consists of investigations on the performance and combustion characteristics with crude jatropha oil (CJO) operation at different injection timings (27-34 ^{0}bTDC). The injector opening pressure was varied from 190 bar to 270 bar. The results thus obtained were compared with that of the diesel operation.

II. EXPERIMENTAL PROCEDURE

The schematic diagram of the experimental set up is shown in Fig.1. The specifications of the engine are given in Table-1. The amount of air sucked into the cylinder was measured by air-box method. The consumption of fuel was measured by burette method. The jatropha oil is injected into the engine by fuel injector, similar to that of diesel fuel injection. The Table-2 gives the properties of diesel fuel and jatropha oil.

Optimization of Process Parameters of Friction Stirs Processing on Aluminium Alloy 7075

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Abstract: Friction Stir Processing (FSP) is a relatively new entrant in the domain of solid state processing technique mainly applied in the manufacturing of hybrid metal matrix composites. Aluminum and its corresponding alloys have got the excellent combination of properties like high strength to weight ratio, good corrosion resistance, high thermal and electrical conductivity, high reflectivity, low emissivity making it as a ideal choice for the aerospace and automotive industries. Some application in these industries requires high hardness and high strength to weight ratio. Friction Stir Processing realizes achieving this by introduction of reinforcing particles onto the surface of the metal matrix by the rubbing action of the tool. The process is mainly influenced by the process parameters like tool rotational speed, Traverse speed (feed), Geometry of the tool, Tool material, diameter of the hole, spacing of the hole, tool tilt angle, plunge depth etc .In this work, attempts will be conducted to identify the optimum process parametric conditions for Friction Sir Processing by using Taguchi Design of experiments technique to enhance surface properties of Aluminum alloys.

1. INTRODUCTION

Vipin Gopan et al. [1] investigated the effect of various process parameters on Friction Stir Processing of Aluminum alloys. The process parameters selected for this study are speed (rpm), feed (mm/min) and depth of cut (mm). Three levels of speed, feed and depth of cut were selected and experiments were designed on the basis of Taguchi Orthogonal array. NareshNadammal et al. [2] studied the microstructure and texture development during single and multiple pass friction stir processing (FSP) of a strain hard enable wrought Al-Mg alloy (AA5086) was investigated.. S.Chainarong et al. [3]attempted to improve the mechanical properties of SSM 356 aluminum alloys by friction stir processing, a solid-state technique for micro structural modification using the heat from a friction and stirring. The parameters of friction stir processing for SSM 356

aluminum alloys were studied at three different travelling speeds: 80, 120 and 160 mm/min under three different rotation speeds 1320, 1480 and 1750 rpm. The hardness and tensile strength properties were increased by friction stir processing. Vaira Vigneshand Padmanaban [4]applied friction stir processing on AA5083, with an objective to improve its wear resistance. FSP was conducted by varying tool rotation speed, tool traverse speed and tool shoulder diameter as per face centered central composite design. WenjingYanget al. [5] proposed a novel approach named double-sided friction stir processing (DFSP) was proposed to prepare 7050-T7451 aluminum alloy plates, and effects of solution treatment (ST) on microstructures and mechanical properties of DFSP were investigated.

2. EXPERIMENTATION:

Fig.1: FSP

The vertical milling machine model of HMT FM-2V is used during the work process of friction stir processing. The capacity of machine is 10 HP. The range of the speed is 35 RPM minimum and 1800 RPM maximum. The feed capacity is minimum 16mm/min and maximum 800 mm/min and the bed size of 800 mm in "X" direction, 400 mm in "Y" direction and 400 mm in "Z" direction. 6mm thick AA7075-O plates has been cut according to required dimensions as 150mmx100mm with power hacksaw. Tapered cylindrical tool of H13 hardened tool steel with

shoulder diameter as 18mm and pin diameter as 6mm at the base and 3mm at the tip has been selected to perform the processing operation. Slots have been made on the AA 7075-O plates with milling machine as per the requirement, three slots have been created on each plate of AA 7075 material and the Silicon Carbide powder with grain size as 150nm has been filled in the slots created. The process parameters such as Tool rotational speed (rpm), Feed (mm/min), Width of slot (mm),Depth of slot (mm)that are considered as per the following table 1. The experiments

APPLICATION OF GENETIC ALGORITHMS FOR MODELLING THE EDM PARAMETERS ON MACHINING OF AISI 4340 STEEL

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ABSTRACT

Every production /manufacturing unit mainly focuses on Productivity and quality which are two important aspects and have become great concerns in today's competitive global market. In the present work, maximizing the Material Removal Rate (MRR) as productivity estimate and minimizing Surface Roughness (SR) is taken as most important output for the Electrical discharge machining (EDM) process. EDM is still an experience process and at the same time selecting optimization and modeling parameters is costly and time consuming. With an intention of these two opposite in nature requirements have been simultaneously satisfied by selecting an optimal process environment (optimal parameter setting). Objective function is obtained by Regression Analysis (RA) and Analysis of Variance (ANOVA) and is optimized using Genetic Algorithm (GA) technique. The model is shown to be effective MRR and SR improved using optimized machining parameters. The material used for the machining is AISI 4340 steel and the electrode material is copper.

Key words: Two wheeler Industry, pollution, electric two wheeler, compromises for green benefits, exploring market segments.

Analysis of Catalytic Converter Performance with Air Box using CFD Technique

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ABSTRACT

Catalytic converter is one of the import element in reduction of automobile exhaust emissions without changing the basic design of engine. This paper deals with the basic understanding of typical species transportation inside converter using computational fluid dynamics techniques as it is very difficult to visualize inner flow pattern. The study of pressure contours and velocity vectors of exhaust gas are observed using numerical model. the model is created by ANSYS Workbench, domain discretization and analysis was carried out in Fluent. The substrate is modeled as porous media and boundary conditions of mass flow and temperature is applied using analytical calculations. Converter is equipped with air box for further increase in turbulence thereby decreasing the emissions rapidly. The results showed that the converter with air box performed better that converter without air box.

Keywords— *CFD, Catalytic Converter, Spark Ignition, Flow, Fluent,*

I. INTRODUCTION

The spark ignition engine exhaust gases contains oxides of nitrogen (NOx) 20g/kg of fuel, carbon monoxide (CO) 200g/kg of fuel, and organic compounds which are unburned or partially burned hydrocarbons (UHC) 25g/kg of fuel [2]. Catalytic converter is a stainless steel container mounted along the exhaust pipe of engine and inside the container is a porous ceramic structure through which the exhaust gas flows [3]. In most of the converters, the ceramic is a single honey comb structure with many flow passages. The passages comprises of many shapes, including square, triangular, hexagonal and sinusoidal. Early converters used loose granular ceramic with the gas passing between the packed spheres. Since it is difficult to keep the sphere in place, many converter developers opted for ceramic monolith which offers various advantages. Among these advantages are smaller volumes, lower mass and greater ease of packaging (Heck & Farrauto, 1995), [4]. The active catalyst layer is applied on the monolith walls. The coating, called washcoat, is composed of porous, high surface area inorganic oxides such as $\gamma Al2O3$(gamma alumina), $CeO2$ (Ceria) and $ZrO2$ (Zirconia). Noble metal catalyst, such as Platinum (Pt), Palladium (Pd) and Rhodium (Rh), are deposited on the surface and within the pores of the washcoat (Pontikakis, 2003) . Exhaust gas flowing in a catalytic converter diffuses through the washcoat pore structure to the catalytic sites where heterogeneous catalytic reactions occur. The specific reactions vary with the type of catalyst installed. Most present-day vehicles that run on gasoline are fitted with a "three way" converter, so named because it converts the

Analysis of Chassis Frame for Solar Vehicle

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ABSTRACT

The automotive industry is one of the largest and most widely spread industries. However, due to growing concerns caused by fossil fuel emission the industry is shifting to alternate sources of energy. Of these, solar energy is one form that has seen large growth in usage around the world as well as in the recently growing electric vehicle industry. The development of a fully solar powered electric car has been an ongoing process with various organizations around the world doing research for the most optimal version. However, most of these vehicles require expensive customized parts. This work gives an introduction to the design and analysis of a solar-electric car that is completely fabricated through off the shelf parts which undergo minor modification in order to be fit to the frame.

Keywords— *Solar car, NSVC,*

I. INTRODUCTION

A solar car is a solar vehicle used for land transport. Solar cars are usually run on only power from the sun, although some models will supplement that power using a battery, or use solar panels to recharge batteries or run auxiliary systems for a car that mainly uses battery power. Solar cars combine technology typically used in the aerospace, bicycle, alternative energy and automotive industries. The design of a solar vehicle is severely limited by the amount of energy input into the car. Most solar cars have been built for the purpose of solar car races. Some prototypes have been designed for public use, although no cars primarily powered by the sun are available commercially. Solar cars depend on a solar array that uses photovoltaic cells (PV cells) to convert sunlight into electricity. Unlike solar thermal energy which converts solar energy to heat, PV cells directly convert sunlight into electricity.[1] When sunlight (photons) strike PV cells, they excite electrons and allow them to flow, creating an electric current. PV cells are made of semiconductor materials such as silicon and alloys of indium, gallium and nitrogen. Crystalline silicon is the most common material used and has an efficiency rate of 15-20%.
WHY SOLAR?
- One of the biggest concerns today is the problem of power production causing pollution by the use of fossil fuels
- The solution for using of polluted plug in electric source is Solar energy. When these types of vehicles are charged through solar power it becomes a complete environmental eco-friendly Vehicle.

Study of Smoke Levels Using crude Jatropha Oil with Preheated Condition and at Normal Condition Injection in High Grade Low Heat Rejection Combustion Chamber of Diesel Engine at Different Operating Pressures

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Abstract

Smoke levels were determinedon high grade insulated diesel engine which consisting of ceramic coated cylinder head, 3mm air gap insulated liner and 3mm air gap insulated piston with different operating conditions of jatropha oil(at normal temperature and preheated temperature) with varied injection pressures from 190 to 230 and 230 to 270 bar and varied injection timing from 270 bTDC to 320 bTDC . Smoke levels were calculated at various values of brake mean pressure(BMEP) of the insulated engine and the data is compared with the neat diesel operation of standard engine.

Keywords: Vegetable oils. Conventional Engine, LHR Engine

1. INTRODUCTION

Increasing the import cost of crude oil, depletion of fossil fuel, increasing the pollution levels and usage of more diesel fuel leading replace the diesel fuel.The only alternative to diesel fuels are vegetable oils and alcohols. Production of alcohols aresuffice for the pharmaceutical companies and the other problem during the combustion formation of aldehydes takesplace. Edible oils are being consumed along with the food.Non-edible oils like cotton seed oil, crude jatropha oils, etc are the best substitutes for the diesel.The concept of low heat rejection(LHR) engines are being introduced by the researchers for the restricting the heat flow through all three possible ways, the cylinder head, line and through the piston. It keeps the combustion chamber very hotand helps in complete combustion of high viscous low calorific value vegetable oils.Ceramic coating inside the cylinder head(LHR1) which restrict the heat flow through the head , Air gap 3mm in the liner and the piston(LHR-2)which restrict the heat flow through the liner and piston. The combination of LHR-1 and LHR-2(LHR-3), restrict the heat flow in all three possible ways. Experiments were conducted on single cylinder four stroke water cooled diesel engine of 3.68kw brake power at a speed of 1500 rpm at a compression ratio of 16:1 with the engine with engine with LHR-3 combustion chamber with crude jatropha oil[4-6]. Particulate emissions were found to be decreased by 10-15% and increased nitrogen oxides by 40-45% in comparison with conventional engine with mineral diesel operation.Experiments were also conducted on the same configuration of the engine using biodiesel with varied injection timing and injection pressure. Particulate emissions decreased by 25-30% and nitrogen oxides levels increased by 45-50%[7-9].Experiments were conducted with different degrees of insulation LHR-1,LHR-2 and LHR-3 combustion chamberswith varied injection pressure and injection timing of 270bTDC[10-12:13]. It was showed that particulate emissions were found to be decreased while increasing nitrogen oxides levels with the increasing degree of insulation and further improve increasing pressure. However, there is gap in investigations on study of exhaust emissions on LHR-3 combustion chamber using crude jatropha oil at normal condition and preheated condition and comparing with conventional engine with neat diesel fuel operation.

2.MATERIALS AND METHOD.
2.1.Crude Jatropha Oil.

Experimental Investigation on Four Stroke Single Cylinder Diesel Engine with EGR & Magnetic Field

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Abstract: In recent years, many efforts are being made to improve power output and emissions of internal combustion engines. The use of diesel engines have been increased day by day due to the higher thermal efficiency. But it has serious drawback of having emissions in the form of soot and NO_x emissions.To meet the stringent vehicular exhaust emissions norms worldwide, several exhaust pre-treatment, post-treatment techniques has been employed in modern engines.EGR is a prominent technique which is being used widely to reduce and control oxides of nitrogen (NO_x) emissions from diesel engines. EGR controls NO_x as it lowers oxygen concentration and flame temperature of the working fluid in the combustion chamber. However, use of EGR leads to trade off in terms soot-emissions. Higher soot generated by EGR leads to long term usage problems inside the engine such as high carbon deposits,lubricating of oil degradation and enhanced engine wear.It has been reported that magnetic field helps to improve mixture formation by increasing the atomization process of spray in the combustion chamber due to increasing rate of disintegration of the deposits as a result of reduction in surface tension and viscosity of the fuel.Ortho state of hydrogen molecule is achieved by applying a strong magnetic field along fuel line. Due to magnetic field, hydrogen of hydrocarbons changes its orientation and gets converted from para to ortho state. This hydrogen of fuel actively interlocks with oxygen and produces more complete burn in the combustion chamber. Hence magnetic field helps dispense oil particles and become finely divided the present experimental study has been carried out to investigate the effect of EGR, magnetic field and the combination of both on performance of single cylinder 4 stroke diesel engine From the values conducted in the experiment, it has been concluded that with the use of the combination of EGR at 5% and 10% and the magnetic field the engine showed best performance characteristics with brake thermal energy, BTE as 32.3% and brake specific fuel consumption, BSFC as 0.2628 kg/kwhr and exhaust gas temperature being 375^0C and 380^0C respectively.
Keywords: EGR, BTE, BSFC, magnetic field, Ortho Hydrogen, Para Hydrogen, Atomization, Combustion

I. INTRODUCTION

In recent years, there are so many efforts towards the improving power output and emission of internal combustion engines per fuel, so that the products of combustion exhausted from internal combustion (IC) engines environmental friendly, and also beneficial for cost. The use of diesel engines have been increase day by day, due to their high thermal efficiency and low pollutant formation characteristics but it has a serious drawback of having a comparative larger amount of emission which is larger than that of a gasoline engine.

Magnetic field that ionized the fuel based on the principle of magnetic field mutual action with hydrocarbon molecules of fuel and oxygen molecules. There are various physical attraction forces between hydrocarbons and they form densely packed structures called pseudo compounds which can further organize into clusters. Due to the physical attraction forces between hydrocarbons, oxygen atoms cannot penetrate into their interior during air/fuel mixing process, these structures become stable. The external force by means of magnetic field helps in polarizing the hydrocarbon fuel. Due to that hydrocarbon fuel change their orientation and increase space between hydrogen. This hydrogen of fuel actively interlocks with oxygen and producing a more complete burn in the combustion chamber. It has been noted that when the fuel passes through a magnetic field, it helps in increasing the atomization process by improved mixture formation. Due to increasing the rate of disintegration of the droplets as a result of reduction in the surface tension and viscosity of the fuel.

Wagner et al. [1]. tried to achieve lower emission of NOx and soot using highly diluted intake mixture. At very high EGR rate (around 44%), PM emission decreased sharply with a continuous drop in NOx emission but this high EGR rate significantly affect the fuel economy

HOT DEFORMATION BEHAVIOUR STUDIES ON 58Ni-39Cr NICKEL

SUPER ALLOY BY THERMO-MECHANICAL SIMULATION

AND FINITE ELEMENT METHOD

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ABSTRACT

As there is an increased requirement of materials with superior quality and excellent properties, there is a search for appropriate materials to satisfy the increasing demands of product requirement, which has led to the invention of numerous new materials such as Nickel Super alloys that have superior properties, like great toughness, high oxidation resistance. These materials are inducing extensive interest in distinct fields like Oil and Gas Industries, Marine Industries, Nuclear Reactors industries. The forging of the Material needs to be done at a temperature zone to avoid failure of the Material. The torrid plastic deformations of the Alloy have been explored using Gleeble 3500 simulator and the consequences of forging aspects have been studied. It is then compared with the simulation studies carried out, using a finite element-based simulation software tool, DEFORM^{TM} 3D. The results from both studies indicate that there is an upsurge in the flow stress as the forging temperature is lowered and the strain rate is increased. Flow softening is observed at every deformation conditions, which can be reflected by a crest followed by a drop-in flow stress with further straining.

KEYWORDS: Deformation, Strain Rate, Temperature, Flow Stress, Microstructure, Thermo-Mechanical Processing & FEM Simulation

Original Article

1. INTRODUCTION

Generally, the alloys are exposed to complicated time intervals, stress, strain rate and high temperatures in industrial forming operations. The consideration of the alloy behaviour under torrid deformation conditions has a huge impact for designing as metal-forming operations owe a huge influence over the metal flow sequence as well as the metallurgical transformation kinetics, in turn resultant mechanical properties including flow stress. Therefore, the investigation of stress-strain allocation is crucial for deformed materials for production process.

Ni-Cr-Mo Alloys have tremendous mechanical durability, suitable biocompatibility with atmosphere, steep modulus of elasticity, soaring melting point, ultra-low densities, immense hardness, resist to deflection, excellent adhesion properties with ceramics, accessible processing, high resistance to corrosion because of surface passivation, by creating chromium oxide film(Cr_2O_3) upon the alloy. Despite their attractive mechanical properties, susceptibility to corrosion of non-precious materials has limited their application because of corrosion products containing a variety of lethal metal ions. To embellish some unique characteristics, other materials are also combined with the alloy. When Molybdenum is added to the alloy, a solid solution is formed hardening the alloy

Effect of Air Flow Rate on Performance of Natural Draft Wet Cooling Tower

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ABSTRACT

Cooling tower is an important heat exchanger that is to be used in power plants for efficient working of cycle. Main object of work is to determine the performance of a natural draft wet-cooling tower with various inlet conditions. A commercial tool FLUENT is used to simulate the transport phenomena inside the tower. A 50 tons cooling capacity model has been taken as reference model. The developed model is analyzed with two air flow rates in vertical direction and by combining air inlet temperature and water inlet temperature, the height of the water inlet is increased from the basin height and the same analysis is done by using the two flow rates of air and water into the system. It is observed that the temperature and humidity inside the tower are the main influence factors on the performance of cooling tower. Due to increase in height to an optimum condition the performance of the cooling tower is increased and further increase in the height decreased its performance. Simulation shown that due to temperature of fluid inlet, cooling capacity of the tower has been improved with increase in air airflow rate when compared with natural aspirated air.

Keywords— Cooling tower, CFD, Fluent, Heat exchanger

I. INTRODUCTION

Cooling tower operation is based on evaporative cooling as well as exchange of sensible heat, when warm water comes in contact with cooler air, there is sensible heat transfer whereby the water is cooled. The major quantity heat transfer to the air is through evaporative cooling while only about 25% of the heat transfer is through sensible heat. Figure 1 taken from Mulyandasari [4] shows the schematic of a cooling tower.

According to Hill [6] the factors influencing the performance of a cooling tower are:The cooling range, The approach, The ambient wet bulb temperature, The flow rate of water through the tower, The flow rate of air over the water, The ambient temperature, The type of fill in the tower and Total surface area of contact between water and air

Figure 1 Schematic of a Typical Mechanical Draft Cooling tower

Power Quality Improvement by using DSTATCOM with PSO Tuned PI Controller

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Abstract - *The Distribution static synchronous compensator (DSTATCOM) is used for reactive power compensation, Power factor correction, reduction in total harmonic distortion and to stabilize the source and PCC currents. DSTATCOM is a parallel connected device connected at a point of common coupling (PCC). The Controlling algorithm for DSTATCOM is developed by using synchronous reference frame theory (SRF) and which is utilized for generating the reference currents. The DSTATCOM comprises of VSI, dc link capacitor and control circuit. The dc link capacitor voltage is regulated by using the PI controller. The K_p, K_I values obtained with conventional method may not give accurate results. Hence, In this paper a PSO based technique is proposed to obtain optimal results. The simulation representation is progressed using MATLAB simulation software.*

Keywords: DSTATCOM; voltage source inverter (VSI); SRF Theory; PI controller; PSO.

1. INTRODUCTION

In current years because of new advancement in technology most of the industries and commercial customers prefer the usage of Power electronics devices. Because of these non-linear loads distribution system is facing power quality (PQ) problems such as poor power factor, harmonics injection, voltage sag, voltage swell, high neutral current, unbalance in three phase loading, distortions in source currents. These distortions may pass through the entire network. These PQ problems may responsible for increase of power losses, violates the power flow limits, and reduce the system response time [1]. Various custom power devices such as DSTATCOM (Distribution Static Synchronous Compensator), Unified Power Quality Conditioner (UPQC), and Dynamic Voltage Regulator (DVR) are operating for power quality (PQ) improvement [2-3]. Among these devices DSTATCOM is preferred because of its features such as low power losses, generating few harmonics, ability of high regulatory, less cost, and compact size. For controlling of DSTATCOM various methods are used such as Synchronous Reference Frame (SRF) Theory, Instantaneous Reactive Power (IRP) Theory [4], and Instantaneous Symmetrical Component (ISC) Theory [5]. The performance of DSTATCOM depends on the reference currents generation. DSTATCOM is a VSI based custom device. For switching of VSI Hysteresis current controller [6-8] is used. Among the other PWM current controllers, Hysteresis controller gives the fast response, reduce peak current and shows better performance. PI controller is operated for regulating the DC link voltage [9-11]. For tuning of PI controller trial and error method is the simplest but it consume more time and the performance is also not good. Instead of Trial and error if soft computing techniques are used such as Ant colony Optimization, Genetic Algorithm (GA), Ziegler-Nichols technique and Particle Swarm Optimization (PSO) [12-15] technique, better results can be obtained. In this paper PSO which gives the best global gains for PI controller is applied for obtaining gains and DSTATCOM is simulated using MATLAB/SIMULINK software.

2. CONFIGURATION OF DSTATCOM

DSTATCOM is a practice power device connected at PCC through interfacing inductor. DSTATCOM is used for injecting or absorbing the reactive power into system to stabilize the voltages in the system due to variation of the load. It is also used to inject the compensating currents into the system. I_{sa}, I_{sb}, and I_{sc} are the source currents and V_{sa}, V_{sb} and V_{sc} are the source voltages of phase a, b, c, I_{la}, I_{lb} and I_{lc} are the load currents and compensating currents are symbolized as I_{fa}, I_{fb} and I_{fc}. Non linear load is supplied with the system source voltage of 11kV, 50Hz. Transformer is used for step down the voltage from source to load in distribution system, and this non linear load develop harmonics in the system. In order to compensate these harmonics DSTATCOM is connected at the Point of Common Coupling (PCC) to inject the compensating currents into the system to make the system balance. DSTATCOM configuration consists of VSI, dc capacitor, and control circuit. PI controller is operated to maintain the dc capacitor voltage constant. SRF theory is used for controlling the DSTATCOM by generating the reference currents and then actual currents and reference currents are compared, the initiated error signal is given to the VSI for switching of IGBT's [2]. DSTATCOM representation is shown in Fig .1.

Performance Evaluation of Induction Motor for Unipolar and Bipolar Pulse Width Modulation Techniques

T. Murali Krishna, K. KrishnaVeni, G. Suresh Babu, D. Sushma, C. Harish

Abstract: *Inverter is an interface device between a dc source and ac loads which converts DC voltage to a variable voltage, variable frequency AC voltage. While converting, it introduces harmonics in the output of the system which results in additional heating of induction motors. Hence in order to diminish these harmonics, different techniques are introduced viz. external and internal control techniques in which the latter is more efficient. Out of the all proposed methods, the internal control of inverter which is also called as Pulse Width Modulation (PWM) can be achieved either using unipolar modulation technique or bipolar modulation technique. In this paper, the control circuitry to model unipolar and bipolar modulation methods is simulated and their performance is checked on an induction motor and compared in MATLAB Simulink environment.*

Keywords: *Unipolar modulation, bipolar modulation, induction motor, total harmonic distortion, lower order harmonics.*

I. INTRODUCTION

Now-a-days in industries there is a dire need of flexible operation of induction motor to meet various types of applications which require a smooth variable ac voltage from the fixed supply. To provide variable voltage to induction motor, inverters are given due importance in converting the dc voltage to variable ac voltage of required frequency using suitable electronic circuit. In the process of realization of inverters various parameters like efficiency, size, cost etc. are to be considered, however, the basic conventional two-level inverter supplies an ac output voltage of desired magnitude and frequency in which the output voltage is not a pure sinusoid. In order to achieve controlled ac voltage at the output terminals of the inverter different techniques are proposed. They are external control and internal voltage control techniques in which internal voltage control technique is more efficient and economic compared to external control technique, because it is more rugged and complex. Internal voltage control can be achieved by controlling the conduction period of the switching elements in the inverter, which is also called as Pulse Width Modulation. In majority of the inverters, most commonly employed harmonic reduction method is Pulse Width Modulation (PWM)[1-2]. To deliver controlled voltage at the inverter output terminals, the switches must be ON and OFF with high frequency, hence fully controlled switches like IGBTs are considered for many medium voltage applications. This PWM requires a reference signal which is to be compared with a high frequency triangular carrier signal in order to generate driving pulses to the switching elements of the inverter. The basic PWM techniques are classified into two types based on their switching frequency; they are i) fundamental frequency technique ii) High frequency switching technique. The former is used for selective harmonic elimination whereas the latter is carried either by using space vector or carrier based PWM techniques. Out of these, the simplest and cost-effective method is carrier based pulse width modulation technique[3-4] . In pulse width modulated technique, a sine wave is used as a reference signal, whose frequency is same as that of inverter frequency is compared with high frequency triangular wave form called carrier signal to generate the pulses for the switches in the inverter circuit. In order to change the output voltage, vary the magnitude of the reference signal. This variation is indicated as amplitude modulation index (m_a) and to change the switching frequency vary the frequency of the carrier signal called frequency modulation index (m_f) [5-6].There are different PWM techniques based on reference wave, conventional and advanced PWM techniques to cater a variable voltage, variable frequency for the speed control of induction motor for different topologies like Unipolar and bipolar.

II. CONVENTIONAL INVERTER

Conventional inverter is a basic model which consists of four switches (IGBT) for single phase inverter and six switches for three phase inverter with anti-parallel diode are connected as shown in Fig.1. The two-level inverters are mainly used to obtain controllable voltage. A conventional two-level inverter consists sources and many switches for controlling voltage or current though it has controllable voltage has some limitations at high frequency due to high switching losses and constraints of power device rating. Due to the presence of sources and switches it has high power losses. A group of switches that provide positive half cycle are called as positive group switches and the other which provides negative half cycle are called as negative group switches.

ANN Controller for Damping of Oscillations using Interline Power Flow Controller of AC Transmission System

Ch.Venkata Krishna Reddy, K.Krishna Veni, G.Tulasi Ram Das

Abstract: *Interline Power Flow Controller is series compensating device for series compensation of Active and reactive power with distinctive ability of power flow management between many transmission lines in power network. During disturbances in power system, the stability of system causes deviation from stable operation and causes variation in different parameters of power system like load angle and Rotor speed. To suppress oscillations in load angle and rotor speed, the Artificial Neural Network (ANN) controller with IPFC is proposed to increase the stability of power network. IPFC with ANN is considered for analysis of IEEE 14 Bus system. For different fault conditions analysis is carried out using MATLAB/Simulink.*

Index Terms: *Flexible AC Transmission System, Interline Power Flow Controller, Voltage Source Converter, Stability, Artificial Neural Network controller, load angle, Rotor speed.*

I. INTRODUCTION

Present large power networks are experiencing large variation in loads leading to stability of the system. In addition to this, if any disturbance occurs in any part of the system, stability will be altered. Generally the frequent faults takes place in transmission lines rather than faults at remaining parts of power systems. The disturbances occur in transmission lines causes deviation in normal operation of other parts of power systems like Generators, turbines, governors etc. The deviation in normal operation of system causes instability of power system in terms of oscillations in load angle and rotor speed [1].

To overcome such drawbacks, embedding Flexible AC Transmission System (FACTS) controllers in power system plays an important role and offers good control and satisfactory performance. Hingorani [2] proposed thyristor based FACTS technology for application in power systems to improve the performance under disturbances. With advent of high power electronic devices, converter based FACTS technology is finding improved application.

Gholipoura et al. [3] carried out with IPFC in Iran transmission network using dynamic performance of the controller is improved by ANFIS to suppress damping of oscillations. In this paper, in IEEE 14 bus system IPFC with ANN controller is connected in the middle of buses 1 and 12.when different faults occur in system between buses 7 and 8, IPFC will damp the power oscillations. Artificial Neural Network (ANN) controller based IPFC is designed [4] and its performance under disturbances in damping oscillations is tested using IEEE 14 bus multi machine power system [5].

II. SYSTEM CONSIDERED TO STUDY THE PERFORMANCE OF IPFC

 IEEE-14 bus system [5] as shown in Fig 1, is considered to studying the performance of IPFC, under disturbance conditions.
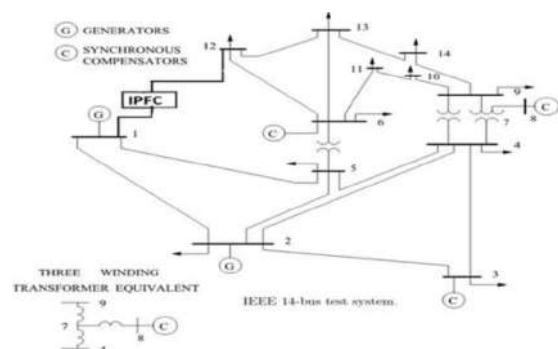
Fig.1 IEEE 14 Bus Power System With IPFC

III. INTERLINE POWER FLOWCONTROLLER
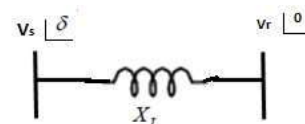
Fig.2 a. simple PS model

Usually the power lines are inductive in nature as its resistance is too lesser related to inductive reactance.
Therefore $|Z| = X_L$ and $\theta = 90^0$ .Hence sending end real power to be transferred is given by

Modeling of Solar Electric Propulsion System for UAVs

N. VasanthaGowri, C.Harish, D.Harsha

Abstract: UAVs are growing their importance in both civil and military applications. The endurance of UAVs are related to their on board fuel carrying capacity which is limited by the weight class of aircraft. There is a need for long endurance UAVs for persistent Intelligence, Surveillance, Target Acquisition, and Reconnaissance(ISTAR) missions. One of the solutions to overcome the endurance limitations for usage of UAV is the renewable energy. Among all renewable energy, solar energy is found more economical. Electrical powered aircraft/(UAV) propulsion system uses electrical energy to change the velocity of UAV. Electric propulsion system is now mature and widely used technology on spacecraft. In this work, UAV with solar cells on the surface of the wings as well as on board energy storage is discussed. This paper quantifies the requirement for perpetual endurance in solar-powered flight.

Keywords:UAV, Solar electric propulsion system, Perpetual Endurance

I. INTRODUCTION

Unmanned Aerial Vehicle (UAV) is a powered vehicle that does not carry a human operator and it can be operated autonomously or remotely. It can be expendable or recoverable. UAV can carry a lethal or nonlethal payload. This work is aimed to provide solar power to for aircraft for its continuous both in day-night cycle. In Military Applications UAVs are capable of performing a variety of missions supporting military and intelligence purposes. UAVs are used for applications like, Reconnaissance Surveillance and Target Acquisition (RSTA), Surveillance for peacetime and combat Synthetic Aperture Radar (SAR), Deception operations, Maritime operations (Naval fire support, over the horizon targeting, anti-ship missile defense, ship classification), Electronic Warfare (EW) and SIGINT (Signals intelligence), Meteorology missions, Route and landing reconnaissance support. In Civil Applications Today, the civilian markets for UAVs are still emerging. However, the expectations for the market growth of civil and commercial UAVs are very high. UAVs are used for applications like, Policing duties, Traffic spotting, Sports events film coverage, Communications relay and remote sensing. Most of the UAVs are run on fossil fuels, which are limited in resources. Due to limitations in fuel carrying capacity, long endurance is not possible. Fossil fuels increases pollution problems (carbon footprint).Need to use renewable energy is on demand due to reduction in fuel cost and green energy promotion. Fuel Propulsion System, Gas propulsion system store energy in the form of fuel and use an engine to drive propulsion devices. Various types of engines are used for UAVs, including two-stroke or four-stroke internal combustion engines running on gasoline fuels. Fuel systems are more difficult to setup and maintain the electric systems. They are noisier, less reliable, and cannot be controlled as precisely as electric systems. They provide significantly longer endurance, and can be quickly refueled. Due to this reasons, fuel power systems are often used. Presently the only viable technology to overcome the above issues is to use SOLAR ELECTRIC POWER. Analysis has been carried out to track estimation of Solar electric power supply for typical UAV, Placing solar cells on fixed wing, Propulsion system and it is part of UAV that makes the entire structure to fly. In a work came out by Morton et. al [1] the application, design considerations and validation of prototype is determined through several experimental steps of solar powered Unmanned Aerial Vehicle. Shiau et. al [2]designed solar power management system (SPMS) for an experimental UAV this will provide required power for on-board electronic systems on the UAV. Improvements to airframe design, variable pitch propulsion system and custom-designed power electronics are presented by D'Sa et. al [3] along with validation of designs through testing. Torobi et. al [4] analyzed solar cells used to increase the endurance of the aircraft a electrical circuit was developed by using this to measure the output power of the batteries of the UAV during flight. Flight test results showed in cruise phase that flight without battery is achievable. Sydorenko et. al [5] stated that solar energy considered potential source of power for UAV and energy input and consumption can be successfully balanced for typical Solar Photovoltaic Fundamentals, Technologies and Applications, each and every types of solar cells were explained by UAV. Singh et. al [6]. André NOTH [7] designed of Solar Powered Airplanes for Continuous Flight. Andrea [8] explains the battery management for large lithium battery packs. Héctor [9] proposed a design of solar UAV, construction and test of propulsion system for solar UAV. Trembly et. al [10] discussed about experimental validation of battery dynamic model for EV applications.

Perpetual endurance is the ability to collect more energy during day and excess energy is used to store in batteries for night flying. Different designs are compared by size, weight, battery used, energy power, and C-ratings. This paper considers energy balance for perpetual endurance to unmanned aerial vehicles (UAV) equipped with solar cells on the wings, which collect energy used to drive a propeller. The design requirement is formulated as a threshold of the Power Ratio that characterizes the ability of an UAV to fly while solar-powered.

Simulation

Sunlight which is emitted by the sun converted into electricity due to photovoltaic

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SCADA System Application for Power Distribution in Hyderabad City

Abstract

The authors discuss the application and working of a Supervisory Control and Data Acquisition (SCADA) system for operation and control in the power distribution system at Vidyuth Soudha, Hyderabad, Telangana state, as a case study. SCADA system increases the efficiency of power utility and is helpful in managing the large-scale automated industrial operations like factories, water supply systems and conventional power generator systems. A remote operation is possible to monitor and control the different terminals at site of operation by connecting them to terminals that exist at several kilometers away. The sensor units send data to the central terminal that helps to monitor the load dispatch and to control the load distribution. The system requires a communication device, a user interface and software to work with. The daily operation, load management and system faults are monitored for managing the overall system with minimum supervision and manpower. The SCADA system in power utility is useful to monitor and for generation, transmission, distribution and management related functions.

Paper Details

Performance analysis of Solar PV Emulator operated in various Modes

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Abstract—A Photovoltaic (PV) energy source or a Solar PV Emulator is required to analyze the performance of PV Equipment under variable conditions. Typical PV Modules are expensive and static with narrow customization abilities. A PV Emulator can appreciate the characteristics of various PV Modules under various test conditions virtually. A Switch Mode Power Supply (SMPS) based cloud connected PV Emulator is used to validate I-V and P-V characteristics of a given PV Module is effectively illustrated.

Keywords— **PV Emulator, Fixed Mode, Table Mode**

I.   INTRODUCTION

The rapid growth of generation of electric energy with renewable energy source compared to its counterpart is exceptional because of the fact that fossil fuels are getting dwindling. Among all the Renewable energy sources Solar based energy conversion is strenuous. Solar energy has occupied center of attraction in renewable energy arena because of low carbon emission and decreased capital investments But due to high expenditure and lack of applying various test condition (type of locality, climatic conditions, different irradiations and temperatures), research on actual PV module has been a major issue of concern [1].

For research and testing, it requires stable and repeatable condition which is not quite possible with real PV Modules. Also factors like unguaranteed irradiation, unrepeatability due to varying climatic conditions and requirement of huge space for installation make's research no way near in reality [2].

In order to address above issues, solar PV Emulator is one of the solution in present conditions. I-V and P-V characteristics are readily validated by PV Emulator. Though there are large numbers of PV Emulators available in Solar World [1-5],a stepmother treatment is showered on real time conditioning.

In this Paper, A Switched Mode Power supply based cloud connected PV Emulator with four channels is used to imitate actual PV modules. Different parameters under different environmental conditions (location, time duration, tilt angle, irradiations and temperature) can be emulated by PV Emulator. PV Modules with 1.6 kW power range, Open circuit voltage around 200 V and Short circuit current of maximum 32 A can be simulated by using mentioned Emulator.

II.   SYSTEM DESCRIPTION

Block diagram of SMPS based Emulator is shown in Fig.1 . It mainly consists of Programmable power supply , data logger and Personal computer with ecosence_50 application.

Modeling and Simulation of Linear Electro Mechanical actuator for Missile Application with high redundancy

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Abstract. The military, defense missiles are self propelled systems with high security, reliability, and accuracy in targeting the obstacle. The firing of missiles is considered as milestones in growth of research areas. In such field, Electro Mechanical Actuator (EMA) helps to maintain the altitude of missile path, which is predefined path. Moreover, As EMA is exposed to environmental aspects, the altitude of missile may get altered. So on replicating the critical components i.e., BLDC drive and power inverter in EMA based control systems, the accuracy in monitoring the altitude is improved without any interruptions and with high reliability. This paper proposes dual redundant power inverter system to run BLDC motor with redundancy management and logic, fault tolerant and fault diagnosis by using MATLAB/SIMULINK with the results.

Keywords: Missile, Electromechanical actuator (EMA), Dual redundant, Inverter, BLDC drive, Fault diagnosis.

1 Introduction

Military defense systems [1] involve updated technology in firing, detection, tracking, attacking of against missiles. Military missiles can be surface to air missiles, surface to water missiles, air to air missiles to protect India and in advancement in technology aspect. In such defense applications, an expertise, and mastered, highly equipped control architectures are required. In such control surfaces, EMA plays a key role and it should be capable to act according to the desired conditions. A subsystem of an EMA includes power electronic circuitry, intelligent controller, an BLDC drive, ball screw mechanism for position detection, and its associated components. In order to decrease the complexity, the replication of building block is enough to meet the criteria. As the fundamental structural blocks in EMA are power converters and BLDC drive, designing of these components became a challenge. In some of the missiles, EMA is installed in two stages each for some amount of distance and it is triggered through battery. The concept of missiles are completely different as in aircraft. A simple fault occurrence in any subsystem of electromechanical actuator leads to whole outage in the system and investment would be in risk. So, missile applications also require safety and accessibility, So 'Redundancy management' is necessary.

Dual redundant[3] logic is a combination of two modules, each module is having three phase power inverter stage and BLDC motor windings as shown in the below Fig.1.

DAMPINGOSCILLATIONS IN POWERSYSTEM USING POWER SYSTEM STABILIZER

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Abstract: The extensive interconnection of power networks by weak tie-lines can restrict the steady-state power transfer limits due to low frequency electromechanical oscillations. The low frequency oscillations may result in interruptions in energy supply due to loss of synchronism among the system generators and affect operational system economics and security. Further, in order to maintain steady state and transient stability of synchronous generators, high performance excitation systems are essential.Apower system stabilizer (PSS) installed in the excitation system of the synchronous generator improves the small-signal power system stability by damping out low frequency oscillations in the power system. It does that by providing supplementary perturbation signals in a feedback path to the alternator excitation system. Hence study of PSS effect on damping oscillations of single machine infinite bus system for various working conditions is carried out in this paper.The entire idea is simulated using MATLAB/SMILINK.

Keywords: power system stabilizer (PSS), synchronous Generator, Excitation system.

1   Introduction:

Electrical power systems are often operated in critical situations that may lead to stability problems in the power grid, and in worst-case blackouts. Large interruptions have historically occurred in many of power systems around the world and this may lead to panic and state of emergency in the society [1-3]. The generator control equipment is able to improve the damping of oscillations in an electrical network and thereby prevent instability in the grid. One of the solutions to improve a troublesome grid may be to coordinate and tune this control equipment correctly [4-6]. In larger key power plants, the share of keeping the system stability is high. These plants must be equipped with additional regulator loops, which will increase the damping of the power oscillations. To prevent instability in the Norwegian power grid these Power System Stabilizers (PSSs) are required as a part of the control equipment for generators above 25 MVA. There exist several different types of PSS's in the market. IEEE (The Institute of Electrical and Electronics Engineers) has defined some standards; these are mainly based on different input signals and processing of signals [7-8].

The stability of synchronous machine under disturbance is examined in the case of single machine connected to infinite bus system (SMIB). The analysis of SMIB gives how the system will affect under the disturbance and the system will produce some oscillations. Those oscillations are classified into inter area and local area mode oscillations. The SMIB system is predominant in local mode frequency oscillations.

The power system oscillations are classified according to the part or area of power system affected by them. These oscillations are mainly classified into intra plant oscillations with frequency range if 2 to 3 Hz, which are caused when machines on the same bus oscillate against one another and the torsional oscillations which occurs between rotating plants in a network. Torsional oscillations have much higher frequency range of 10-46 Hz, which is associated with the turbine generator shaft. These can occur predominately when a multi-stage turbine generator is connected to the grid through a series

Optimal Power Flow using Hybrid Ant Lion Optimization Algorithm

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Abstract

In this paper a novel Ant Lion Optimization (ALO) algorithm based on hunting mechanism of ant lions is being hybridized with the arithmetic crossover operation of Genetic Algorithm (GA) for solving optimal power flow in power systems. This hybridization leads to the better quality of solutions and improve the exploration in search space. The capability and performance of the proposed algorithm is tested on benchmark test functions and IEEE-14 bus test system. Generation fuel cost, emission of generating units and transmission line losses are considered as objectives for optimal power flow problems. Simulation results show that the proposed algorithm provides an effective and robust high-quality of solutions. The obtained results will be compared with the existing literatures for justifying the superiority of the proposed algorithm.

Keywords: Optimal Power Flow (OPF), Hybrid Ant lion Optimization (HALO) Algorithm, arithmetic crossover operation, generation fuel cost, emission and transmission line losses.

1. Introduction

Optimal power flow (OPF) is a vital aspect for the operation and controlling of power system. OPF problem determines the optimal operating state of a power system by optimizing objectives like generation fuel cost, emission of generating units and real power transmission losses with considering specified physical and operating constraints, with some control variables such as generators real output power and voltages, transformer tap setting, phase shifters, switched capacitors and reactors.

Basically, OPF problem consists of a great number of constraints, and it is a nonlinear, non-convex optimization method and for solving OPF problem many conventional methods and evolutionary algorithms have been proposed. Conventional methods include linear programming, non-linear programming, quadratic programming, Newton method, gradient method, and interior point methods [2-10]. They have limitations like converging at local optima and are suitable only for continuous problems. Due to these limitations, they are not suitable for the actual OPF solution. Like in [7] gradient steepest-descent method having exterior penalty functions is proposed, it causes slow convergence rate and to overcome this, Newton algorithm and Quasi-Newton method had been proposed in [8-9]. Then it was being observed that the they did not converges due to improper selection of initial condition then researchers developed linear programming method in [10] but it also fails to provide proper solutions.

However, metaheuristic optimization methods are employed which can easily overcome limitations of conventional methods. In the recent years, they had gain more momentum which leads to the origin of a wide range of heuristic algorithms such as

AN OVERVIEW OF GEOTHERMAL ENERGY IN INDIA

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Abstract: Geothermal energy is heat within the earth that can be used either as steam or hot water to heat buildings or generate electricity. As the earth interior will be hotter than sun surface and continuously heat is produced inside the earth which is inexhaustible, geothermal energy comes under a class of renewable energy sources. As fossil fuels are depleting day-by-day particularly in highly populated countries like India, geothermal energy is gaining importance as an alternate source of energy. This paper emphasizes interior topology of the earth, electricity production from geothermal energy, different types of geothermal power plants and various geothermal provinces located in India.

Index Terms **-Geothermal energy, geothermal power plant, geothermal province.**

I. INTRODUCTION

The word "geothermal" is originated from the Greek words "geo" means earth and "therme" means heat. This energy comes from deep inside the earth. Due to the abundant availability of coal reserves in the country, Coal is used as a major fuel in India's Power Production Industry contributing to a massive share of nearly 70%. These coal reserves are prone to be extinct one day and further it affects the environment thereby affecting human life. So we need to switch over to non-conventional energy sources wherein geothermal energy is one among them which has the potential to replace fossil fuels completely and help mitigate global warming. Further geothermal energy is cleaner because neither fuel transporting equipment nor huge boiler equipment set up is not required. The slow decay of radioactive particles in the earth's core produces geothermal energy. This process happens in all rocks.

The earth's interior topology has a double layered core almost 4000 miles beneath the earth's surface. Earth has a number of layers. The innermost layer consists of Earth's core made of solid iron and is surrounded by an outer core of hot molten rock called magma. The next layer is mantle which is made up of magma and rock. The mantle surrounds the core and is about 1800 miles thick. The next layer is the outermost layer called crust which is like a shell of an egg. This crust forms the continents and ocean floors. It can be 3-5 miles thick under the oceans and 15-35 miles thick on the continents [1].

When the earth's crust breaks into pieces called tectonic plates, Magma comes close to earth's surface near the edges of these plates, which is where many volcanoes occur. The lava that erupts from volcanoes is partly magma. Rocks and water absorb heat from magma deep underground and attain the highest temperatures. People around the world use geothermal energy to heat their homes and to produce electricity by drilling deep wells and pumping the hot underground water or steam to the earth's surface.
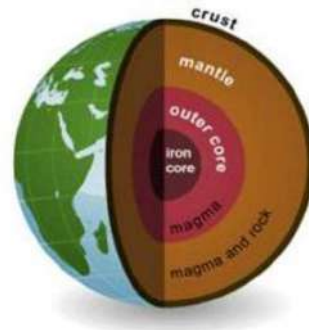
Fig.1: The earth's interior (Courtesy: U.S. Energy Information Administration [1])

II. GEOTHERMAL POWER

Geothermal power generation requires hot water or steam at a high temperature (300^OF to 700^OF) that is to be drawn from deep inside the earth. This requires deep well to be drilled which may act as a reservoir of energy. All the geothermal power plants use naturally available hot water and steam from the earth to turn turbine generators for producing electricity. India has an estimated geothermal potential of 10,000MW. The various countries which produce geothermal power particularly in Asia are the Philippines,

THERMAL ANALYSIS ON POWER TRANSFORMER

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ABSTRACT

Abstract: The insulation of transformer oil works best under a specific range. In this paper, the thermal effect arising due to the presence of metallic particle in transformer oil is studied. Finite element analysis on the transformer is studied through Steady State Thermal. The Heat Flux and thermal error arising due to PD effect is studied. Results under the ideal working temperature of oil is considered, confirming the elevated heat fluxes and thermal error due the presence of conducting particle in transformer oil.

Keywords: Partial Discharge, Heat Flux, Thermal Error, finite element analysis

1. INTRODUCTION

Power Transformer being an indispensable part of power station. Partial Discharge is one of the major aspects for insulation failure in electrical assets. The lifecycle of insulation system is also measured with the help of thermal evaluation. A study on the different working temperature of oil in transformer is conducted in a range of 333.15k to 338.15k under a constant velocity which proves that insulation performance of oil is best in this span of temperature [1]. In this, under varying temperature of oil; PD effect shows the different trajectories. The oil velocity also marks the satisfactory performance. The effect of temperature on PD effect is analysed through different ways. A needle-paper oil insulation was adopted through various factors such as oil temperature, PD inception voltage, PD repetition number and breakdown voltage of the model to analyse the effect of temperature on PD characteristics. This concludes to a fact that PD inception voltage and breakdown voltage has direct relation with oil temperature. It also has a major influence on the surface condition of the pressboard [2]. Chao Tang studies the thermal stability of modified insulation paper cellulose based on molecular dynamic simulation. The assessment of static mechanical performance of the model is performed with raising temperature with the elastic modulus of modified and unmodified cellulose decreases moderately. Thus, the modificationof insulation paper cellulose by polysiloxane grafting will greatly enhance the thermal stabilityof insulation paper [3].Sachin B. Paramane studies the effects of oil leakage on thermal hydraulic characteristics andperformance of a disc-type transformer winding. The leakage is found to lead to an onset of a reversal in flow direction: in

A Novel Method for Electrical Energy Consumption Tracking using Internet of Things

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Abstract **– in big cities everything depends on electricity. Electricity is mainly used for lighting, heating, cooling, cooking, cleaning, personal caring, computer and entertainment.** The **Internet of Things, Big Data services are Energy consumption monitoring in residential houses provides useful information to save energy while reducing CO2 emissions, but also for predictive maintenance and optimization of applications what results in costs reduction. One can monitor the time to time usage of electricity and this data can be sent to a dedicated webpage with the help of raspberry pi. The electricity bill and usage alert can automatically be sent to the dedicated mail id of the person. The methodology is an IoT based, using raspberry pi with the help of programming in python and HTML. With this novelty method efficiency enhances, reliability increases and man power can be reduced and also be used to send alerts to the users if there is over usage which helps in energy conservation.**

Keywords—IoT, Python, HTML, Energy Meter

I. INTRODUCTION

Electricity is one of those discoveries that have changed the daily life of everybody on the planet. Electricity is the key component to modern technology and without it most of the things that we use every day simply could not work, and would never have been created. Our mobile phones, our computers, the Internet, our heating systems, our televisions, and our light bulbs - nearly everything in the home would be completely different. There would be completely different systems put in place in the home to ensure that we can remain warm, and to ensure that we can live properly every day.

For every human being there are basic facilities that are needed i.e. food, clothing and shelter and next in the list comes electricity, it was discovered by Benjamin Franklin in the year 1879 and it revolutionized the world. In the world today there is electricity everywhere without which no one can live even for a second. But we often get a doubt whether we are using it efficiently; this is where this work is helpful.

With this method one will be able to monitor the power consumption time to time with the help of webpage and also if there is an increase in the power consumption it can be sent to the mail of the person. This can be achieved with a Raspberry Pi and by programming it with Python.

Sensing the data from the Digital Energy meter with the help of Optocoupler IC and sending this data (count of number of blinks made by the energy meter) to the Raspberry Pi. Based on this data checking whether the power consumption has crossed the specified limit and sending the alert to the mail id of the user. It sends the billing details time to time to the mail id and also to the webpage.

This system consists of an energy meter which is used to measure power consumption in household and industries interfaced with a Raspberry Pi3. A typical energy meter consists of 4-LEDs one of which signifies power consumptions to this LED an optocoupler is connected to count the number of blinks. This optocoupler is connected to the Raspberry Pi. The Raspberry Pi in response calculates the energy consumed and electricity bill and uploads this data to both the local and global web servers periodically and the end of month electricity bill is sent to the user via email using SMTP (Simple Mail Transfer Protocol).

The meter which is used for measuring the energy utilizes by the electric load is known as the energy meter. The energy is the total power consumed and utilized by the load at a particular interval of time. It is used in domestic and industrial AC circuit for measuring the power consumption. The meter is less expensive and accurate.

II. PROPOSED METHOD BLOCK DIAGRAM
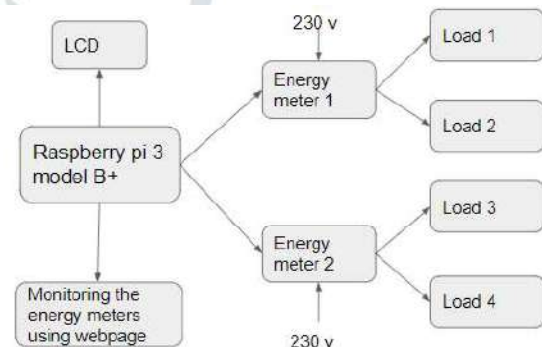
Fig.1 Block Diagram of proposed setup

A. Raspberry Pi3 (RPi) model B+

The Raspberry Pi is manufactured through licensed manufacturing deals with Newark_element14 (Premier Farnell), RS Components and Egoman. All of these companies sell the Raspberry Pi online. Egoman produces a version for distribution solely in China and Taiwan, which can be distinguished from other Pi by their red coloring and lack of FCC/CE marks. The hardware is the same across all manufacturers.

The Raspberry Pi3 is a credit card sized computer that plugs into your TV and a keyboard, it's like a little PC which can be used for many of the things that your desktop PC does, like spreadsheets, word processing and games. It also plays high definition video. The design is based around a Broadcom BCM2837 SoC, which includes an ARM CORTEX 1.2 GHz processor, VideoCore IV GPU and 1 GB of RAM. The design does not include a built in hard disk or solid state drive, instead relying on a micro SD card for booting and long term storage. This board is intended to run Linux kernel based operating systems.

Analysis of series/parallel multilevel inverter with symmetrical and asymmetrical configurations

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Article Info	ABSTRACT
	Usage of high power and medium voltage applications in domestic and industrial purpose has been increased in the recent years. Also, the penetration of renewable energy sources is increasing rapidly. To make use the renewable energy sources there is a need of using inverters. The basic inverter is conventional two level inverter which produces the square wave output voltage. The major drawback of conventional inverter is it contains more harmonics. Therefore, multilevel inverters have been introduced with staircase output voltage waveform. Lot of multilevel inverter topologies have been developed and cascaded H bridge type is the more frequently used. But, it requires more number of switches for higher output voltage level. In this paper, a novel 7 level asymmetrical multilevel inverter topology is proposed with less number of switches. This proposed topology is compared with already existing topology. The simulation of circuit and result analysis of the circuit is carried out by using Matlab/simulink software. The comparison between existing topology and proposed topology is given. The results are discussed and presented.

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1. INTRODUCTION

Country's electrical energy demand is more than the electrical energy generated and at the same time fossil fuel supply is being decreased. Therefore, the research has been started towards alternative energy sources and the outcome is renewable energy sources (RES) [1]-[4]. Solar, wind and fuel cell are the most commonly used renewable energy sources. The power produced from these energy sources is known as distributed generation (DG) [5]-[7]. The DG system can be employed at load centers and therefore, the transmission cost of power will decrease. At the same time, the demand for power electronic converters also has been increased because; the energy generated from renewable energy source is not enough to connect directly to the load or grid. The DC voltage produced from the renewable energy source must be converted to AC to connect it to the grid. For this purpose, inverters are used and the basic inverter is two level inverter. This inverter produces the square wave output voltage which has more harmonic distortion. These harmonics causes for parasitic torques in case of electrical machines and produce more amount of heat losses. Hence to overcome these drawbacks, multilevel inverter topologies have been introduced and developed.

These multilevel inverters have got more attention due to their advantages. The multilevel inverter produces very low harmonic distortion in the output voltage waveform, the rate of rise of voltage (dv/dt) is less and it draws current with low ripple content when used for drives applications. There have been lot of multilevel inverter topologies developed like diode clamed, flying capacitor type and cascaded H bridge (CHB) [8]-[11] multilevel inverter topology. Out of these, the diode clamped and flying capacitor type requires more number of diodes and capacitors respectively and cascaded H bridge type is the most

Performance Analysis of Acquisition Algorithms for Navic

N. Alivelu Manga

Abstract: Indian Regional Navigation Satellite System (IRNSS), is an indigenous navigation system designed and developed by ISRO (Indian Space Research Organization).It is named as NavIC, Navigation with Indian Constellation by Indian Prime Minister. NavIC is designed to have seven satellite constellation that provides reliable position, navigation and timing services over India. The focal modules of NavIC receiver are acquisition, tracking and navigation unit. Among them, acquisition is the data processing unit for detecting satellite signals and their corresponding code phase and carrier frequency. In this paper, various acquisition algorithms like Serial search and Parallel Code Phase search algorithms are analyzed and compared with Cooley-Tukey FFT algorithm and sub-sampled Fast Fourier transform (ssFFT).The results obtained in MATLAB shows that the acquisition computation time for ssFFT based NavIC receiver is faster than parallel FFT acquisition and the Cooley-Tukey FFT IRNSS acquisition algorithm is faster and provides better code phase and carrier frequency values compared to serial search acquisition algorithm.

Keywords—IRNSS, NavIC, acquisition, parallel code phase search algorithm, serial search acquisition algorithm, ssFFT, Cooley-Tukey FFT.

I. INTRODUCTION

Indian Regional Navigation Satellite System provides position, velocity and time over Indian region. It is developed ISRO and coined as NavIC by Prime Minister of India. The IRNSS project was approved by government of India in June 2006 with a sanction of 1420 Cr (Bhaskaranarayana, A, 2008). The IRNSS constellation consists of 7 satellites of which, three are in GEO stationary and four are in GSO synchronous orbits. The IRNSS provide two services namely Standard Position Service (SPS) and Restricted Service (RS).The main modules of NavIC receiver are acquisition, tracking and navigation unit. Among them, acquisition is the data processing unit for detecting satellite signals and their corresponding code phase and carrier frequency. This paper is planned into six sections. SPS signal generation is discussed in Section II. Section III describes the receiver architecture. Section IV describes the signal conventional acquisition algorithms and ssFFT and Cooley-Tukey acquisition algorithms. Section V shows the simulation results of the explained acquisition algorithms and their performance comparisons and conclusions are presented in Section VI

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II. SPS SIGNAL GENERATION

In the process of generation of L5 signal, P-code and navigation data are together multiplied.

The next step is the application of BPSK (Binary Phase Shift Keying) modulation with the incoming carrier signal. After that, C/A (Coarse/Acquisition) code is multiplied with navigation data, then application of BPSK modulation with 90degrees phase shifted version of incoming carrier signal. Obtained results from the two modulators are added get L5 signal of frequency 1175.45MHz (Fig. 1). To generate L5 signal of frequency 1176.45MHz, a common frequency signal of frequency, f_o=10.23MHz is used.
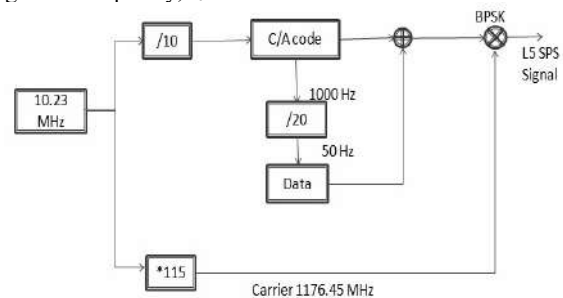
Fig. 1 SPS signal generator Block diagram

The modulo-2 ($\oplus$) addition gives a signal with values {1,0} which is then BPSK modulated with carrier signal to obtain a L5 signal with values {-1,1}. The chipping rate for C/A code is considered as 1.023 MHz and navigation data bit rate is 50 Hz.

A unique C/A code is utilized by each of the satellite for the implementation of CDMA. The C/A codes are generated using pseudorandom noise (PRN) codes, also known as Gold codes. Two Linear Feedback Shift Registers (LFSR), G1 and G2 each of 10 bits, generate maximum length PRN codes having a length of $2^{10} - 1$ bits. The length of each generated code is 1023 chips. The code chipping rate used is 1.023 Mcps. The polynomials G1 and G2 used for SPS code generation are defined as given below:

$$G1 (X) = 1 + X^3 + X^{10}$$
$$G2 (X) = 1 + X^2 + X^3 + X^6 + X^8 + X^9 + X^{10}$$

These polynomials are analogous to the ones used for GPS C/A signal. These polynomials are implemented by using Maximum Length Feedback Shift Registers (MLFSR) each of length 10 bits. The initial state of G2 register provides the chip delay. The all bits of the G1 register are initialized to 1. Then, the bits of these two registers are exclusive-OR'ed to obtain the final PRN sequence of length 1023 chips. For all 7 satellites, the time period of the PRN sequence is 1 millisecond.

Analysis Of Scheduled Routing Algorithms On 5-Port Router For Network On Chip Application

Dharmavaram Asha Devi, Satyavati Jaga

Abstract— Network on Chip (NoC) is a trending technology with many advantages of reducing the latency and area. The proposed paper is analyzed the two popular scheduling algorithms, First In First Out (FIFO) and Round Robin for transmission of data packets within the network on chip. The proposed algorithms are developed in Verilog Hardware Description Language and analyzed in 28nm Technology. These scheduling algorithms are verified with NoC parameters: Latency, Throughput, Bandwidth, Bit rate and Baud rate. Here, five port routers have been considered for testing and verification of data packets. After the analysis of these two algorithms, round robin algorithm has given better results with less latency and high throughput. The proposed analysis is used in networking and on chip communication applications.

Index Terms— Baud rate, Bit rate, First In First Out, Hardware Description Language, Latency, Network on Chip, Round Robin.

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1 INTRODUCTION

NETWORK on Chip helps in organizing the communication between source and destination modules. The communication between modules will be through various routing paths and switches. It has number of point-to-point connections of data links through switches. In order to improve the efficiency of power, complex SoCs are replaced with NoCs. Therefore, operating frequencies can be improved. Then, it is easy to implement the network communication with lesser delays. Within the NoCs, routing concept is a key to improve the latency, area and throughput. The NoC can tested with many algorithms to know which algorithm suits the best. The parameters of NoC: Latency, Throughput, Bandwidth, Bitrate and Baudrate are analyzed with different algorithms. The parameter values are to be calculated to get the performance of the NoC.

i. Latency
The time taken by the task from source to destination is called as latency. It is a delay time to network. It is also an important parameter of NoC. It is to be reduced to get the best performance.

ii. Throughput
The number of data bits transmitted successfully in a given amount of time between source point to destination point is called throughput. It is an important parameter of NoC. It is calculated by number of tasks completed in unit time. Its formula is (information or data bits transmitted) / (time). Its units are bits per second.

iii. Bandwidth
The amount of data transmitted in fixed amount of time is called a bandwidth. It is bits per second or bytes per second.

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It gives the speed of a network. It gives the performance of NoC router.

iv. Bit rate
The rate at which amount of data bits transmitted is called a bit rate. It is a parameter of NoC to determine the performance of a system. It is always greater than or equal to baud rate. The calculation is also simple and can be calculated by using the formula:

Bitrate = total number of bits transmitted /second.

The relation between bit rate and baud rate is:
$$b = n*B.$$

Where, b = bit rate; n = total number of bits including redundant bits (start bit, stop bit and parity bit); B = baud rate;

v. Baud rate
The number of symbols transmitted per second is called as baud rate. It gives the signaling speed. It is always less than or equal to bit rate. It sends symbols which are group of bits made up of 0's or 1's. It also be calculated by using a formula:

Baudrate = total number of information bits transmitted/second.

The relation between baud rate and bit rate is:
$$B=b/n.$$
Where, B = baud rate; b = bit rate; n = number of bits.

In the proposed research work, we have analyzed the NoC parameters with respect to First In First Out and Round Robin algorithms. The organization of the paper is represented with seven sections including 1. introduction followed by 2. History of investigations, 3. Scheduling Algorithms for NoC, 4. First In First Out algorithm, 5. Round Robin algorithm, 6. Result analysis and 7. Conclusion.

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Research of Machine Learning Algorithms using K-Fold Cross Validation

Nagadevi Darapureddy, Nagaprakash Karatapu, Tirumala Krishna Battula

ABSTRACT--- In machine learning, Classification is one of the most important research area. Classification allocates the given input to a known category. In this paper different machine algorithms like Logistic regression (LR), Decision tree (DT), Support vector machine (SVM), K nearest neighbors (KNN) were implemented on UCI breast cancer dataset with preprocessing. The models were trained and tested with k-fold cross validation data. Accuracy and run time execution of each classifier are implemented in python.

Keywords - Logistic regression (LR), Decision tree(DT), Support vector machine (SVM), K nearest neighbors (KNN), K-fold cross validation.

I. INTRODUCTION

Machine learning at an esteemed level is commonly the course of teaching an algorithm on how to gradually improve upon a given task. In research machine learning may be observed as the theoretical and mathematical modeling on work process. Practically it is a study of building applications that display iterative improvement. Predominantly out of many ways three most recognized classes are unsupervised learning, supervised learning and reinforcement learning.
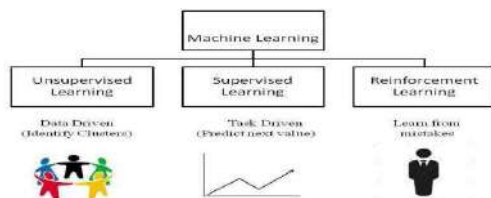
Figure 1: Types of machine learning

Supervised Learning utilizes training data and feedback from individuals to determine the relation of provided inputs to outputs. For instance, to predict the given image is apple or not. Supervised learning practiced when data is labeled. This algorithm forecasts new data. There are two categories of supervised learning:

- Classification
- Regression

Classification categorizes the data into given number of classes. It can be binary classifier with only two classes ex. Classification of spam and non spam email or Multi class

classifier with more than two classes ex. Classification of types of students.

When the output is a continuous value, the task is a regression. For example, a financial interpreter may require calculating the amount of a stock based on a range of features like equity, previous stock performances, and macroeconomics index. The system will be trained to estimate the amount of the stocks with the lowest possible error.

II. METHODOLOGY

The algorithms in this paper implemented on the dataset of mammograms with classification as the task.

A. Dataset: Breast Cancer Wisconsin (diagnostic)

Features are enumerating from a digitized image of a fine needle aspirate (FNA) of a breast mass. They characterize the cell nuclei exist in the image. The attributes in this data set are ID number and diagnosis (M=malignant, B=benign) [7], from each cell nucleus ten real-valued features compute are radius, texture, perimeter, area, smoothness, compactness, concavity, concavity points, symmetry, and fractal dimension. Below figure 2 shows the parameters of the dataset and figure 3 shows the count of malignant which is represented with 1and benign with 0.

Figure 2: Parameters of the dataset
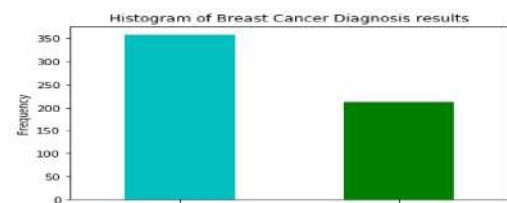
Figure 3: Parameters of the dataset

B. Data Preprocessing and features selection

In data preprocessing, data is to be cleaned first as it contains irrelevant data. The parameters of dataset as shown in fig.2 has irrelevant data i.e. column Id. Next data

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Estimation and Analysis of Instrumental Biases for GPS and NavIC Satellites and Receivers

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ABSTRACT

The positional accuracy of Global Positioning System (GPS) and Navigation with Indian Constellation (NavIC) are affected by errors, one of the predominant errors is instrumental delay. This delay distorts the satellite signal and effect the position accuracy. To counter this problem, efficient models shall be used. In this paper, satellites' and receivers' instrumental bias is estimated using a modified Fitted Receiver Bias (FRB) method, Singular Value Decomposition (SVD) technique and Self-Calibration of Pseudo Range Error (SCORE) model. The FRB method is based on the minimization of standard deviation of vertical Total Electron Content (TEC) computed from different satellites. The SVD based Least Mean Square (LMS) algorithm uses the values of one-day period corresponding to four GPS and NavIC stations. It uses data from dual frequency GPS receivers. To derive the instrumental bias errors the SCORE technique uses a self-consistency constraint on the receiver's measurements of ionospheric delay.

Key words: FRB, Instrumental Delay, SVD, SCORE

1. INTRODUCTION

GPS is a satellite based navigation system developed by the Department Of Defense (DOD) of United State Government. The GPS consists of six orbital planes with four satellites each. Hence, GPS constellation contains a minimum of 24 satellites [1]. NavIC has a 7-satellite constellation which covers India and a range of 1,500 km beyond its borders [2]. NavIC can provide position accuracy of within 10m over the Indian landmass and less than 20m over the oceans. NavIC system operates at two frequencies L5 and S that provide two types of services i.e. Standard Positioning Service (SPS) for civilians and Restricted Service (RS) for specific users. The accuracy of user position depends on ranging errors. For better position estimation these errors should be analyzed and mitigated. The GPS receiver makes corrections for clock errors and other effects but there are still residual errors which are not corrected. The signal that is modulated by the carrier is delayed by the instrumental bias [3]. The amount of delay in the signal is directly proportional to the TEC in the signal path and inversely proportional to the square of the operating frequency.

2. SINGULAR VALUE DECOMPOSITION ALGORITHM

To reduce multipath errors noise and Singular Value Decomposition (SVD) algorithm is used. The SVD based LMS algorithm is used to estimate the instrumental biases [4].

Step 1: The GPS position is estimated using Bancroft method and Kalman filter.

Step 2: The earth-centered angle is estimated using elevation angle (E) of the satellites with respect to the ground station GPS and also IRNSS receiver.

$$[E, S, A] = \text{elevation (receiver}(x,y,z),\text{satellite}(X,Y,Z)) \qquad (1)$$

Where, x,y,z are the receiver's and X,Y,Z are the satellite's coordinates respectively.

Step 3: TEC is estimated using GPS dual frequency and pseudo ranges by using the following formula,

$$\text{TEC} = (P2-P1)/40.30*(f1^2 * f2^2)/(f1^2 - f2^2) \qquad (2)$$

Where, f1 and f2 are the GPS frequencies, P1 and P2 are the pseudo ranges

Step 4: Slant TEC is computed using the vertical TEC and Slant factor,

$$\text{STEC} = \text{Slant factor}*\text{TEC} - (\text{fitted biases}) \qquad (3)$$

Where, Slant factor is estimated from,

$$1 + (16*((0.53-\text{elev}).\wedge 3)) \qquad (4)$$

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Augmentation of NavIC with GPS Over Indian Region

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ABSTRACT

Global Positioning System (GPS) satellites are used to provide navigational services to the users in India. But now for security reasons, Indian Space Research Organization (ISRO) has developed its own navigation satellite system called as Indian Regional Navigation Satellite System (IRNSS). IRNSS is renamed as Navigation with Indian Constellation (NavIC). NavIC is an emerging satellite based navigation system offering an independent positioning and timing service over India and neighboring regions. Position accuracy of NavIC is 10m on land and 20m in Indian Ocean within 1500km around Indian Boundary. Moreover, to increase user position accuracy, the NavIC can be augmented with other navigation systems. This paper focuses, initially, on the analysis of satellite visibility of augmented NavIC with GPS. Comparative analysis of NavIC and NavIC augmented with GPS is also done in terms of Position Dilution of Precision (PDOP). PDOP specifies the user position error caused by the relative position of the satellites.

Key words: DOP, GPS, NavIC, Satellite Visibility.

1. INTRODUCTION

In May 2006, India decided to develop its own Navigation satellite system called as Indian Regional Navigation Satellite System (IRNSS) [1]. IRNSS is also known as Navigation with Indian Constellation (NavIC). The requirement of such a navigation system is driven by the fact that access to Global Navigation Satellite Systems (GNSSs) like GPS is not guaranteed in hostile situations. NavIC provides two services, one is the Standard Positioning Service (SPS) open for civil use and the other is Restricted Service (RS), encrypted one, for authorized users (military). NavIC if augmented with other navigation systems is expected to provide navigation and guidance with good accuracy. This paper focuses on the assessment of satellite visibility of NavIC-7 (NaivIC with 7 satellits) augmented with GPS. Comparative analysis of the

augmented system with standalone NavIC-7 is also done in terms of PDOP.

2. OVERVIEW OF GPS AND NavIC

The GPS constellation consists of a minimum of 24 satellites positioned in six orbital planes. Each orbit consists of 4 satellites. The orbital planes are inclined at an angle of 55° with respect to the equator. A minimum of 4 satellites are visible from any point on the surface of the earth. The GPS satellites are placed at a height of 20,200 km from the surface of the earth[2].

The NavIC has three segments. They are: Space segment, Ground segment and User segment. The NavIC space segment has a constellation of 7 satellites, orbiting above the earth at a height of 36000 km approximately. Out of 7 satellites, 3 satellites are placed in Geostationary Orbit (GEO) and 4 satellites are placed in Geosynchronous Orbits (GSO). NavIC satellites in Geosynchronous Orbits (GSO) are at a height of 36000 km, and are inclined at an angle of $\pm29^0$ with the equator [3]. Due to this inclination, satellites provide coverage to the higher and lower latitudes near the poles. In Geostationary Orbit (GEO) they remain above the equator.

3. ESTIMATION OF SATELLITE VISIBILITY OF NavIC-7 AUGMENTED WITH GPS

In case of NavIC-7, three SVs (IRNSS-1C, 1F, 1G) are GEO and four SVs (IRNSS-1I, 1B, 1D, 1E) are GSO. There is a possibility of the overlap of two GSO SVs (IRNSS-1I,1D) with the other two GSO SVs (IRNSS-1B,1E) respectively, twice a day, deteriorating the geometry required for proper positioning. Hence, the best as well as the worst cases of satellite visibility are considered for NavIC-7. Augmentation of NavIC with GPS is done according to their respective timings i.e. the constellation of NavIC at 6:00 am is augmented with the constellation of GPS at the same time and so on [4]. Latitude and longitude range of satellite visibility for all the four cases is shown in Table 1.

Estimation of Doppler Positioning for NavIC System in Static and Dynamic Conditions

Sathish Pasika, D. Krishna Reddy

Abstract: The primary objective of any navigation system is to provide accurate user position. Navigation with Indian Constellation (NavIC) is an emerging regional satellite navigation system being developed by ISRO, India. The positional accuracy of the NavIC depends upon various parameters based on the application. Doppler shift is one among those parameters which plays an important role in finding the user position in dynamic conditions. The effect of the Doppler shift is more in high dynamic applications like missiles launching, air navigation due to high relative velocity between receiver and satellite. In this Paper, an efficient algorithm is developed to estimate the Doppler positioning using least squares method in static and various dynamic conditions. For this, the experimental data acquired from Indian Regional Navigation Satellite System (IRNSS)-GPS receiver located at low latitude station (Hyderabad: 17.39°N, 78.31°E) is used. A trajectory path has been simulated to estimate the user position and its accuracy measures in low and high dynamic conditions. It is noticed that, Doppler shift vary ±1KHz for geosynchronous satellites in static conditions, whereas it is ±40KHz in high dynamics. It is observed the position error is high in high dynamics as compared with low dynamics because of the higher Doppler shifts.

Keywords: Doppler positioning, NavIC, IRNSS, Positional accuracies, dynamic conditions

I. INTRODUCTION

NavIC is regional satellite system that provides Standard Position Service (SPS) for civilian users and Restricted Service (RS) for authorized users. It operates with a carrier signal frequency of L5-1176.45MHz and S1-2492.028MHz [6]. Under an MoU between SAC Ahmedabad and Chaitanya Bharathi Institute of Technology (CBIT), an IRNSS User Receiver (IRNSS-UR) is installed in the Navigation and Communication Research Centre (NCRC), Dept. of ECE, CBIT Hyderabad, India. IRNSS-UR receives, down converts and demodulates the transmitted satellite signals. There are various applications that can be developed by using IRNSS receiver. Some applications may require sub meter position accuracy like aircraft navigation, marine navigation and automotive applications [2],[5].

The performance of IRNSS receiver varies based on the application particularly for dynamic conditions. Therefore, it is necessary to evaluate the performance of IRNSS receiver in static and different dynamic conditions. Various applications including land, marine, aeronautic and space navigation can be classified based on relative velocity, acceleration and jerk [3], [4].

The civilian applications like land vehicles and pedestrian navigation with low velocity and acceleration comes under low dynamic applications. Whereas the space applications like aircrafts navigation and missile navigation which exhibits severe maneuvers have accelerations of about 40g (where g=9.80665 m/s^2) comes under high dynamic applications [8]. IRNSS receiver performs the measurement of Doppler shift by comparing the received signal with reference signal generated by local oscillator of the receiver. Due to relative velocity between satellite and receiver, receiver experiences Doppler shift [7], [9].

To minimize the code tracking errors due to Doppler shift variations in GEO satellites, a narrow band correlator is used. In low dynamics conditions, the receiver position may not effected significantly due to Doppler shift. Whereas in high dynamics, the rate of change in Doppler shift is very high due to which the receiver position is inaccurate. By modifying the performance parameters of the receiver, accurate receiver position is possible under high dynamic conditions. The typical Doppler range for conventional GPS receiver in low dynamics is ±7 KHz and the Doppler rate is 1Hz/s, whereas in high dynamics, the Doppler frequency is expected to vary in the range ±100KHz with Doppler rates of about 100Hz/s [10]. The estimation of Doppler positioning for NavIC system in static and dynamic conditions will be helpful for precise point positioning applications [11]. The typical values of various parameters such as velocity, acceleration and jerk for low and high dynamic conditions are presented in Table-I [7]. The applications related to low dynamics are foot walk, land vehicles and for high dynamics spacecraft vehicles and missiles [14].

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Table-I: Comparison of various parameters in dynamic conditions

Dynamics	Velocity(m/s)	Acceleration (m/s^2)	Jerk(m/s^3)
Low	<25	<1g	<10g/s
High	>1000	>40g	>50g/s
Where g is earth gravitational force = 9.80665 m/s^2			

Telugu Character Recognition Using Adaptive Fuzzy Membership Functions With Adaptive Genetic Algorithm Based Techniques

V. V. Satyanarayana Tallapragada, V. Sireesha, G. V. Pradeep Kumar

Abstract: *A novel Telugu character recognition technique is proposed in this paper where the given Telugu handwritten document is processed by normalizing the document and removing the noise. Then slant detection followed by correction process is conceded using the bilinear interpolation method to get more accurate result. Thus the de-skewed documents text lines and characters are separated by making use of Adaptive Histogram Equalization (AHE). In the next stage, the characteristics of the segmented characters are mined with the help of the zoning method. In zoning method, an adaptive fuzzy membership function will be developed by the Adaptive Genetic Algorithm (AGA). By using AGA in zoning method the characteristics are mined from the separated characters. The mined structures are applied to the Feed Forward Back Propagation Neural Network (FFBNN) for accomplishing the learning process. During testing, more number of handwritten segmented Telugu characters will be set to the FFBNN to verify whether the input character is recognized or not. Thus, the proposed method has given more accurate recognition results by using our proposed adaptive fuzzy membership function with AGA method. The proposed method performance is evaluated by getting more number of handwritten Telugu documents and compared with the GA-FFBNN and FFBNN.*

Keywords : Adaptive Histogram Equalization, Feed-forward Back-propagation Neural Network, Adaptive Genetic Algorithm, Zoning, Bilinear Interpolation.

I. INTRODUCTION

Pattern recognition is the process of recognizing an unknown pattern to be one of the patterns of the known database [1]. The performance of this recognition can be verified by statistics related to the number of correct and wrong recognitions [2]. Classification and description are the two tasks which are covered in Pattern recognition [3]. The pattern recognition system design includes three aspects:

- Data procurement and processing
- Data depiction
- Decision making

The crucial part of any pattern recognition task is to primarily classify and then recognize an object that belong to a specific group [4][5]. Methods of Pattern Recognition are

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Statistical Model, Structural Model, Neural Network Based Model [6], Fuzzy Based Model, and Hybrid Model [7][8]. Interpretation of input object as a systematic ordering of symbols which are pre-known is the main objective of character recognition. The task of character recognition may be applied on different kind of combinations of handwritten text, scanned documents and computer printouts. The handwritten text is most difficult to process as the text which is just a mixture of twenty six alphabets, ten numerals and few special characters, will have different fonts. These fonts are not exhaustive in many cases. The computer printouts will also have many fonts, but they are exhaustive [9]. All these, when printed on paper, the shadow of text written back side of the paper creates difficulty when they match with some of the known symbols [10].

Apurva A. Desai [11] carried an interesting task. He presented an optical character recognition scheme on Gujarati numbers. A successful character recognition scheme was presented for handwritten numbers in Gujarati language. Pirlo et al. [12] have proposed a set of fuzzy-membership functions for classification based on zoning. Jomy John et al. [13] have applied the concepts of wavelets for handwritten character recognition. Giuseppe Pirlo et al. [14] have proposed a new class of zone-based membership functions. These membership functions are introduced with adaptive capabilities and its effectiveness is shown. Soumya Soman et al. [15] have proposed a pattern analysis technique to develop a powerful and efficient system for handwritten character recognition.

Amit Choudhary et al. [16] have presented a pattern classifier technique which is used to extract the features. Yunxue Shao et al. [17] have proposed a fast self-generation voting method for further improving the performance in handwritten Chinese character recognition. Toru Wakahara et al. [18] have proposed a GAT correlation method to reduce the computational cost of matching in k-NN classification. Dapeng Tao et al. [19] have proposed the kernel version of DLA, kernel DLA, and prudently show that learning KDLA is similar to leading kernel PCA followed by DLA.

II. PROPOSED TELUGU CHARACTER RECOGNITION SYSTEM

In the proposed technology, first the text documents are obtained from the database and they are pre-processed to eliminate the noise which in turn helps to improve the accuracy of the recognition.

Weight Matrix-Based Representation of Sub-Optimum Disturbance Cancellation Filters

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Abstract—The disturbance cancellation techniques are investigated in this paper for Passive Bistatic Radars. The conventional procedure is to compute a clean signal by iteratively constructing an error vector from the residual of the surveillance samples after subtraction of a linear combination of clutters samples. A weight vector is eventually extracted in pure block algorithms, while a weight matrix is computed in iterative schemes. It is illustrated in this paper that the computed weight matrix in the latter case contains valuable information describing the clutters properties. The weight matrix-based disturbance attenuation technique is then innovated and its effectiveness is compared to the conventional error-based procedure in the test bed of several available iterative algorithms. Moreover, a revision of the FBLMS algorithm is presented to cover the case of complex input signals.

Index Terms—Passive radar, Weight matrix, Clutter attenuation, Computational complexity.

I. INTRODUCTION

Passive Bistatic Radars (PBR) have received further attention in recent years [1]. Their crucial challenge is the utilization of an existing source of illumination in the environment. One of the most applicable waveforms available in environment are FM commercial radio signals which provide a rational compromise between performance and cost [2]. As a result of the low power of the transmitted signal, a long staring time is typically required to provide a reasonable signal to noise ratio.

A dedicated receiver is required to collect the directly received signal (reference signal) as a result of exploiting an illumination source of opportunity. The reference signal is then employed as a matched filter to discover the target coordinates. A cross-correlation function between the surveillance and reference signal reveals the coordinates of the target. However, target peaks are masked under the side lobe effects of more powerful signals (direct signal and clutter echoes).

There is an intensive competition in the literature to address low cost, high-performance clutter attenuation schemes. Almost all algorithms provide some solutions to a convex minimization problem. The cost function is typically norm of the residual of surveillance signal after subtraction of a linear combination of reconstructed clutters (which are bases of a clutter space matrix). Solving the optimization problem in LS sense (Wiener-Hopf method) results in a pure block algorithm which is of high complexity order. However, the pure block schemes can be pipelined and parallelized effectively. Yet this method is inadmissible for moving clutters cancellation. The extensive cancellation algorithm (ECA) is an extension of the LS scheme, presented in [3], to cover moving clutter cancellation scenarios. In this method, limited pre-known Doppler shifts are considered in the clutter space matrix. The more computational complexity of the method is a result of augmenting the clutter space matrix with its Doppler shifted replicas. Moreover, its most important drawback is the irrational assumption of having a pre-knowledge of clutter Doppler shifts. A recursive cancellation algorithm (SCA) is presented as well in [3], to simplify the inverse matrix computation step in ECA. The ECA and SCA batches versions are suggested in [4,5] to save the required operational memory. Also, the capability of ECA-B technique for moving targets detection is investigated in [6] where diverse sources of illuminators are examined. An advantage of batches algorithms is to consider partially the non-stationary effects of environmental conditions in computing the weight coefficients. In non-pure block algorithms like least mean square (LMS) and recursive least square (RLS), a minimization problem is considered in each step. Consequently, the weights are updated as well in each step. Therefore, the iterative schemes are capable of handling the moving clutter cancellation scenarios. Different sub-optimum filters like LMS, RLS and fast block LMS (FBLMS) are elaborated in details in [7]. In FBLMS algorithm, signals are divided into some batches and fast Fourier transform (FFT) is used to reduce computations. Similar to ECA-B and SCA-B, weights are updated in each batch. Apparently, increasing the number of blocks decreases the moving

Inset fed Triple Band U-Slot Antenna for GSM900/GSM1900/WLAN Applications

J. Rajeshwar Goud, N. V. Koteswara Rao, A. Mallikarjuna Prasad

Abstract:-To cover Global System for Mobile Communication(GSM) and WLAN frequency bands, three distinctive Inset fed antennas like rectangular microstrip, dualband dual slot and antennas are designed. Inset fed micostrip antenna is used for GSM1900 with an impedance bandwidth from 1.90GHz to 1.96GHz. Inset fed dual band dual slot antenna is used for GSM1900 and WLAN with impedance bandwidth is considered first band from 1.90GHz to 1.95GHz and second band from 2.38GHz to 2.42GHz. The proposed Inset fed triple band antenna is used for GSM900, GSM1900 and WLAN with appropriate position of slot, is to operate in frequency ranges of first band is from 920MHz to 940MHz, second band is from 1.91GHz to 1.94GHz and third band is from 2.39GHz to 2.43GHz. A correlation among various feed widths, feed lengths and slot widths are exhibited in this paper.

Keywords—Inset fed, Triple band, Dual band, Slot antenna, HFSS, Patch antenna, GSM, WLAN.

I. INTRODUCTION

In present days, design of dual band and triple band patch antennas are highly desirable for wireless communication applications. Patch antennas inferable from their favorable circumstances, for example, low profile, reasonable to produce, light weight and simple to create. Inspite of these points of interest, there are not many inconveniences like limited bandwidth, less power dealing with limit in patch antennas [1-2]. For the most part patch antennas work in various frequency bands, separate antennas are used to cover each band which prompts space-confining issue. One approach to satisfy this necessity is utilizing various antennas, yet it will build the size and intricacy of the system. To overcome this issue, slot antennas are required which gives dual band and triple band frequencies using single antenna with appropriate slot position. From now on it diminishes the system size and multifaceted nature [3]. Large bandwidth can be achieved by adjusting the slot dimensions, which include different shapes like rectangular, triangular, circular [4], elliptical [5], triangles [6] are reported. To achieve dual band operation edge feed has been used [7]. Multi service wireless system, Wide band or dual band and triple band antennas are needed[8-11].

To obtain dual band and triple band behavior in patch antennas by providing slot and excite the antenna in orthogonal direction or Y-shape using microstrip line feeds[12-14]. Regardless, these dual band and triple band slot antennas are large in size, most of the wireless applications minutarized antennas are needed. In literature designed edge cut dual band slot antenna, which finds applications in Bluetooth/WLAN and WiMAX [15] and Corner cut Insetfed dual band slot antenna for PCS and Bluetooth/WLAN Applications [16] which improves the impedance matching.

A novel design of Inset fed triple band U slot, Insetfed dual band dual slot and Inset fed microstrip antennas were presented. These antennas are little in size, straightforward development and minimal effort. By providing inset feed to these antennas better impedance matching is achieved. Dual band and triple band operation is obtained with appropriate slot dimensions, which find applications in GSM and WLAN. The VSWR, return loss, peak gain, peak directivity, radiation pattern and radiation efficiency are explained as well as design details of these antennas are discussed in this paper.

II. ANTENNA CONSTRUCTION AND DESIGN

The Inset fed microsrip antenna geometry is showed up in fig.1, Inset fed dual band dual slot microstrip antenna configuration is showed up in fig. 2, and Inset fed tripleband U slot microstrip antenna structure is showed up in fig.3.
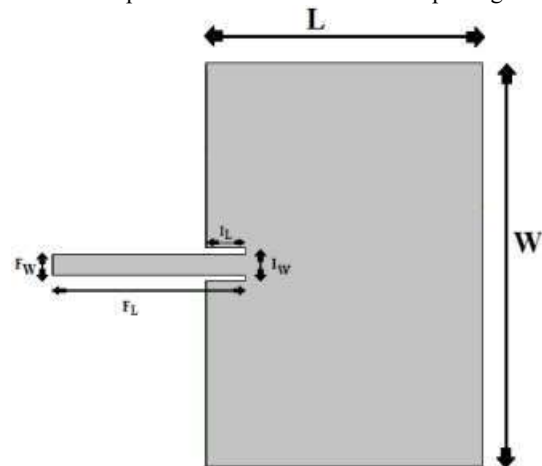
Fig. 1. Inset fed microstrip antenna

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Weight Matrix-Based Least Mean Square Algorithm for Target Detection in Passive Radars

Venu Dunde, Koteshwara Rao NV

Abstract Ambiguity function analysis is the most expensive process for target detection in passive radars. The computational cost is attributed to the extensive range-Doppler field required to evaluate the cross-correlation function. Some tools like fast Fourier transform or batching algorithm are employed to partially reduce the computational effort. In this paper a different generalization of least mean square algorithm is utilized for target detection. The basic idea is to employ the properties of the computed weight matrix to extract target coordinates. The algorithm performance is investigated by computer simulation using some practical simulated FM stereo signal. The results reveal the lower computational complexity of the presented procedure compared to existing methods..

Keywords : Least mean square, Passive radar, Target detection, Weight matrix..

I. INTRODUCTION

By exploiting available transmitters as illuminators of opportunity, passive bistatic radars(PBR) have a very high chance of staying unidentified and unlocalized in space. One efficient high performance, low implementation-cost waveform exploited by PBRs is the commercial FM radio frequency ranging from 88 to 108 MHz band[1]. For evaluation of the range-Doppler coordinates a cross correlation function (CCF) of the surveillance and reference signals is exploited. However, target's peaks are masked by the side lobes of direct signal and clutter echoes due to their much higher power. Different clutter cancellation techniques are suggested in the literature[2–4]. One simple pure block scheme is the extensive cancellation algorithm (ECA)[3].In this case, limited bins of clutter Doppler shifts are included in the pre-constructed clutter space which leads to an increased complexity. Bathes version of ECA is experimentally inspected for clutter attenuation of slow moving targets in[5].In contrast to pure block algorithms, the recursive least square (LSR) and least mean square (LMS) algorithms are

iterative methods applicable of cancelling non-stationary clutters[2].The FBLMS scheme is a fast Fourier block version of LMS which dominates LMS in terms of cost. It is shown in [6]that FBLMS provides faster convergence, shorter processing time and more qualified cross ambiguity function (CAF) for DVB-T passive radars. After cleaning the received signal from disturbances, the costly CCF analysis is performed in an extensive range -Doppler field to detect targets. The target detection capability of FM radio and HDTV is investigated in [7] in terms of range, Doppler resolution and peak side-lobe level ratio. Also, different aspects of AF is compared for FM and DVB-T signals in[8].Since the computed CAF matrix contains important data of limited targets, it has an ideal sparse structure. Hence, multiple studies have employed the compressed sensing technique to reduce the complexity required for solving CAF problem[9]. Furthermore, CAF is analyzed by employing other techniques like correlation FFT, direct FFT, and batches algorithm (BA)in [10,11]. Although LMS scheme is exploited for disturbance cancellation in the literature, a target detection weight matrix-based LMS algorithm is innovated in this paper and it is demonstrated that this matrix contains valuable information revealing targets range-Doppler. The new approach dominates the conventional CCF analysis in terms of computational cost.

II. SIGNAL MODELING AND DETECTION FUNDAMENTALS

Reference and surveillance signals are collected in dedicated channels in a PBR. Assume that the reference channel receives an acceptable copy of the direct signal. Then, they are modeled as:

$$S_{ref}[n] = A_{ref}.d[n] + n_{ref}[n] \quad , \quad n = -R, ..., N-1 \tag{1}$$

$$S_{surv}[n] = A_{surv}.d[n] + \sum_{i=1}^{N_c} c_i.\exp\left(2j\pi n p_{c_i}/N\right).d[n-l_{c_i}] + \sum_{i=1}^{N_t} a_i \exp\left(2j\pi n p_{t_i}/N\right) d[n-l_{t_i}] + n_{surv}[n] \quad , \quad n = 0, ..., N-1 \tag{2}$$

in discrete domain, where d is the complex envelope of the direct signal as a fragment of a FM signal, A_{ref} and A_{surv} are complex amplitudes and n_{ref} and n_{surv} are the thermal noises of the reference and surveillance antennas.

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ARCHIVES

Weight Matrix-Based Representation of Sub-Optimum Disturbance Cancellation Filters For Passive Radars

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Abstract

the disturbance cancellation techniques are investigated in this paper for Passive Bistatic Radars. The conventional procedure is to compute a clean signal by iteratively constructing an error vector from the residual of the surveillance samples after subtraction of a linear combination of clutters samples. A weight vector is eventually extracted in pure block algorithms, while a weight matrix is computed in iterative schemes. It is illustrated in this paper that the computed weight matrix in the latter case contains valuable information describing the clutters properties. The weight matrix-based disturbance attenuation technique is then innovated and its effectiveness is compared to the conventional error-based procedure in the test bed of several available iterative algorithms. Moreover, a revision of the FBLMS algorithm is presented to cover the case of complex input signals.

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Design and Simulation of 12-bit Current Steering DAC

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Abstract - *Most of signals in nature are analog, so electronic systems requires analog processing, hence there are analog processing devices like amplifiers as input and output devices in use, design and implementation of analog system are difficulty, and stability is the matter of concern. On the other hand, digital system design and their implementation are more feasible. Therefore, there is a need to convert the analog input signals into digital signals at the input end, and after processing them in the digital domain; they have to be converted into analog signals in most of the applications. Here current steering Digital to Analog converter implemented with advantage of speed, power and high accuracy.*

Current Steering DACs has indicated that segmented architectures can reduce the need for having large variations in the widths of current source transistors. The current steering DAC architectures helps in keeping the load current (i. e. current drawn by the DAC) constant, and in achieving a higher speed of operation. Keeping these considerations in view, an 12-bit segmented current steering DAC has been designed. The DAC has been divided into four segments of 3-bits each. One segment caters to lower LSB 3-bits of input digital word, second segment caters to lower MSB 3-bits of input digital word, third segment caters to upper LSB 3-bits of input digital word and the last segment caters to upper MSB 3-bits.The design will be implemented in a state of the art 180 nm process, with a supply voltage of 3 V and at a sampling speed of 2 GHz.

Keywords— Current steering DAC, Switch Driver, Cascode Current Mirror, Differential Switch.

I. INTRODUCTION

Nature is completely with analog signal so need to convert analog input signals into digital signals at the input end, and after processing them in the digital domain; they have to be converted again into analog signals in most of the applications. The two obvious types of data converters are Analog to Digital (ADC) and Digital to Analog (DAC) converters.

A. Objectives

The main aim of this paper is to Design a 12 bit current steering DAC. To achieve the aim, the following objectives have been carried out.

1) Design of Switch Driver Architecture.

2) Design of Binary to Thermometer decoder.

3) Design a Dynamic Element matching coder.

4) Design of a 3 bit Current Steering DAC.

5) Design of a 12 bit Current Steering DAC

B. Motivation

The penetration of electronics into areas like computers, communications, instrumentation and embedded systems such as mobile phones, camcorders, HDTVs has given rise to the need for DACs with stringent requirements. The requirements span over features like high accuracy, linearity, reliability, high speed, low power and so on. There are various approaches adopted to achieve specific characteristics as given below:

Speed: Higher speed is generally achieved by the use of current steering DAC architecture

Accuracy: Accuracy can be improved by adopting the segmentation approach in the design of current source array architecture where the ratio of transistor widths is not too high in each segment

C. Problem Description

The binary weighted DAC suffer from a drawback of larger glitch energy induced during mid code transition due to the high switching activity of current sources. The work attempts to achieve minimum switching activity and thus reduce the resultant glitch energy. Binary to thermometer decoders are often used to convert binary codes into thermometer codes to control unit current cells. However the matching property of current sources is still a critical problem. Currently the most effective approach to reduce the mismatch effect and transistor size is the Dynamic Element Matching (DEM) method implemented with a randomizer. This can be designed to have minimum switching activity. The glitch energy can be further reduced in addition to the significant reduction in its transistor size, thus easily allowing for resolutions higher than 14 bit with a small chip area.

D. Literature Survey

To fulfil the objectives of the work, technical papers were referred. Switch Driver and Current Cell were taken from "**A 10 bit 1 GS/s Nyquist current steering CMOS Digital to Analog converter**" Anne van den Bosch student Member IEEE, Marc A.F. Borremans, Student Member IEEE vol .36 No 3. Dynamic element matching

Optimization of Speech signal for improving BER using Adaptive 3-D Turbo Codes

Suman Kshirsagar

Abstract: The introduction of third component in conventional turbo codes improved the code performance for a wide range of block lengths and coding rates with very low error rates. But the parameters such as permeability and permittivity rates were static under noisy environments and hence their adaptability to noisy environment was poor. The proposed A3D-TC has overcome the aforesaid problem. The parameters are made adaptive by generating a Genetic Algorithm (GA) based knowledge source. The bit error rate was minimized by generating parameters based on noise and signal strengths. The improvement is observed for speech signal. At high noise rates the speech signal exhibits minimum bit error rate using this GA based knowledge source and for very few iterations they gave error free signal at low values of signal to noise ratio.

Key words- A3D-TC, Genetic Algorithm, permeability rate, permittivity rate, 3D-TC, bit error rate, signal to noise ratio, iterations.

I. INTRODUCTION

Wireless Mobile communication is one of the fastest growing fields in the telecommunication industry. They provide access to the capabilities of the global network at any time, irrespective of the location or mobility of the user. Due to the progress of Internet and cellular communication, it has become more popular. Therefore, in the present and future mobile communication, data transmission has to be done at high bit rates which may be used for many services like video, high quality audio and also many network related applications like Integrated service digital network (ISDN) etc. Ideally, the transfer of information from the source to destination has to be done in such a way that, the quality of the message is preserved.In this regard, communication system plays a vital role which consists of modulation, a noisy medium, and a demodulation scheme [16]. To ensure reliable communication, E_b / N_o should be maintained at -1.6dB irrespective of how powerful an error control code is.So, it is very important for communication systems to have adequate means for the detection and correction of errors in the information received over communication channel[17].The information has to be

protected from the errors introduced in the communication channel. The information sequence that has to be transmitted may consist of several parts that have different degrees of significance and hence require different levels of protection against noise. This protection is done by a method called coding, where information is disguised by using different codes. Codes are the set of symbols to which meanings or values are attached [3] and are designed to provide different levels of data protection [8]. Hence, the role of error correction codes becomes more prominent.

II. 3-DIMENSIONAL TURBO CODES (3D-TC)

The introduction of third component in the conventional turbo codes seems to be very effective in improving the code performance. But in these codes the parameters such as permeability and permutation rates seem to be very static and as such these codes cannot perform under different noisy environments. In order to overcome this, the post encoder, permeability rate were involved and permutation was performed. Moreover, the computational complexity remains high in deriving such third component codes. This is found to be the bottleneck in analyzing with 3D EXIT chart analysis and inflexible to q-ary orthogonal modulation.The above shortcomings are resolved by introducing adaptive parameters in the third component. Hence, the code is named as Adaptive Third Component Turbo Code (A3D-TC). The proposed A3D-TC improves the error correction capability by having special intelligence (SI), which decides the permeability and permutation rate of the third component encoder.

III. THE ADAPTIVE THIRD COMPONENT TURBO CODES (A3D-TC)

In A3D-TC, as shown in fig 1. The third component parameters are made adaptive. This is accomplished by generating a Genetic Algorithm (GA) based knowledge source and feeding it to feed forward neural network. The network outputs third component parameters according to the noise and signal strengths so that bit error rate at decoding section can be minimized in an effective way.The permeability and permutation rates are found with respect to the different noise strength. The data so obtained is utilized to train Artificial Intelligence (AI).

Phases of Developing Artificial Intelligence and Proposed Conversational Agent Architecture

D. Deepika, a Krishna Kumar, Monelli Ayyavaraiah, Shoban Babu Sriramoju

Abstract: AI has actually required the advancement of numerous improvements and also expansions. Amongst the most effective of these are the strategies of computational logic. This paper reviews the purpose for these anxieties, highlighting the certain attributes of Artificial Intelligence and also contrasting previous surges of automation and robotization with the existing improvements implemented through a wide-spread adoption of Artificial Intelligence.

Index Terms : Artificial intelligence, inequality, technology

I. INTRODUCTION

Expert system was actually initial proposed through John McCarthy in 1956 in his initial scholarly meeting on the subject. The suggestion of devices working like humans began to become the facility of expert's mind and whether if it is actually feasible to make makers possess the same potential to presume and know on its own was actually presented by the math wizzard Alan Turing. Alan Turing was able to place his theories as well as questions in to actions through examining whether "makers can believe"? After set of screening (later was called as Turing Examination) it ends up that it is actually feasible to enable devices to assume as well as know just like humans. Turing Exam uses the practical strategy to be able to pinpoint if makers may answer as human beings.

Expert system is: the discipline that explain the capacity of artificial intelligence similar to people and the ability to reply to specific actions likewise called (A.I.). The need of Expert system is raising each day. Considering that AI was actually to begin with presented to the market place, it has been actually the cause of the fast improvement in innovation as well as service fields. Computer system expert are predicting that through 2020, "85% of consumer interactions will be managed without an individual". This indicates that people simple demand will depend on personal computers and artificial intelligence much like when our company make use of Siri or even Galaxy to inquire about the weather temp. It is actually very essential to be planned for Artificial Intelligence discovery just like UAE possess through putting up a state administrator for Artificial Intelligence in Dubai.

AI supplies integrity, cost-effectiveness, deal with difficult complications, and decide; additionally, AI restrict information from getting shed. AI is actually administered nowadays in most fields whether company or even engineering.

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One of the terrific tools in AI is actually contacted "encouragement learning" which is based upon testing results and breakdown in real life to improve the reliability of applications. Regrettably, Artificial Intelligence is restricted with its ability and performance. Although Expert system created our lives much easier and conserved our team even more time than ever, researchers are actually forecasting that by the substantial dependency on AI humanity can vanished. Scientists suggest that by having a AI equipments, individuals will certainly be jobless and that are going to end in dropping the feeling of residing. Given that makers are finding out as well as performing things a lot more effectively and also properly in a timely fashion, this may be the factor of our termination.

According to the father of Artificial Intelligence John McCarthy, it is actually "The scientific research as well as design of making smart manufacturers, specifically smart pc programs".

Professional unit is actually a means of making a computer, a computer-controlled robotic, or even a system presume sensibly, in the identical manner the smart people presume.

AI is really completed by checking out specifically how specific human brain presumes, and additionally exactly how people discover, decide, as well as work while seeking to handle a problem, and after that making use of the results of the certain study as a manner of creating smart software application as well as devices. Todays Artificial Intelligence (robotics) possesses the capacities to imitate individual intelligence, performing various duties that call for thinking and learning, handle problems as well as create numerous choices. Artificial Intelligence program or perhaps plans that are actually put right in to robotics, computers, and even a variety of other identical units which each one of all of them important assuming capacity. Nonetheless, considerably of the existing Expert system gadgets (robotics) are still under discussion as they still need to possess extra analysis on their way of dealing with duties. Consequently Artificial Intelligence makers or devices must reside in placement to conduct the required jobs by without exercising inaccuracies. Furthermore, Robotics ought to remain in setting to do different tasks without any individual management or even support. Todays expert system like robot autos are actually very progressing along with quality capabilities like handling website traffic, minimizing their velocity, making from self-driving cars and trucks to the SIRI, the specialist system is rapidly improving. The existing focus towards representing the expert system in robotics for developing the human-like qualities significantly raises the human dependancy in the direction of the technology. Moreover, the expert system (AI) ability towards successfully carrying out every narrower and cognitive activity substantially raises people reliance in the direction of the modern technology.

Implementation of Low Cost Home Monitoring, Controlling and Security System using IoT

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Abstract— This paper presents the overall design of Home Monitoring, Controlling and Security System with low cost and wirelessly using IoT. It is designed to provide the access to people who far away from their home. As it uses IOT technology, we can operate home appliances from anywhere in this world and improves the standard of living at home. By using an mobile application or webpage which got all the controls of security and household electronic things, it's made easy for controlling and supervising of the home appliances and security of the home. The installation of this system is cheap and low cost for a home without any changes in home design. It provides remote location control and manual control for the ease of elder people who is not aware of this technology. It provide the high security for the home using a method where the password is not stored in any part of the memory or code of system instead it changes every time and is in the hands of user or owner of the home at lowest cost and maintenance.

Keywords— *Microcontroller, NodeMCU, LCD, Motors, DHT sensor,Iot*

I. INTRODUCTION

A future home is a residence that uses internet-connected devices to enable the remote monitoring, management of appliances and security systems. A home automation system will control lighting, climate, entertainment systems, and appliances. It may also include home security such as access control and alarm systems. When connected with the Internet, home devices are an important constituent of the Internet of Things. A home automation system typically connects controlled devices to a central hub or "gateway". The user interface for control of the system uses either wall-mounted terminals, tablet or desktop computers, a mobile phone application, or a Web interface, that may also be accessible off-site through the Internet. In order to provide the long distance remote Operation and all in one system for the home which makes it easier to the user to control, monitor and secure the entire home from anywhere using the IOT.

II. BLOCK DIAGRAM

It consists of two microcontrollers and a NodeMCU ESP8266 for its operation. It uses two different microcontrollers for two different operations. One is for electrical appliances control and another for security control. It has sensors interfaced to the system. Various sensors like Motion sensor, flame detector and touch sensor are interfaced to the system. It has a 4x4 keypad and 16x2 LCD display.
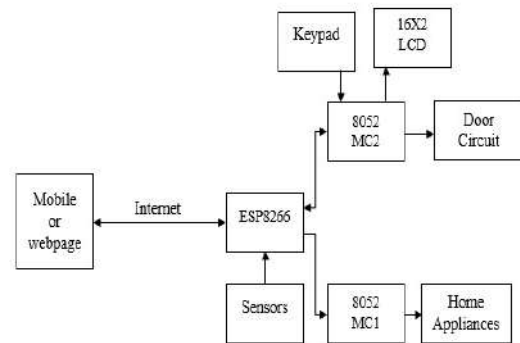
Fig 1 Block Diagram of HMCS System

A. Circuit Disription

The communication between the NodeMCU ESP8266 and appliances controlled microcontroller is parallel and that to it is a five bit data which consists of 4 bit control data and a enable bit. The 5 bit data is obtained from NodeMCU ESP8266 pins from D0 to D4 and connected to port 0 pins of 8051 microcontroller. There is a serial communication between the NodeMCU ESP8266 and Security phase microcontroller and it runs at 9600bps. Touch sensor and Motion detector is connected to security phase microcontroller whereas temperature and humidity sensor and Flame sensor is connected to NodeMCU ESP8266 directly. The electrical appliances are connected to the microcontroller MC1 through the port 0 and port 2 (extended). For microcontroller MC2 , keypad is connected to port 1 and LCD display is connected to port 2 and motor driver is connected to pins P1.2 and P1.3 and touch sensor is connected to pin P1.4. Motion detector is connected to pin P3.3 and taken as a input interrupt (INT1) to the microcontroller 2. The password request switch is connected to pin P3.2 and taken as a input interrupt (INT0) to the microcontroller. The pins P3.0 and P3.1, RXD and TXD respectively are connected to the pins D7 and D8 of NodeMCU ESP8266 respectively. Temperature sensor and flame sensor are connected to A0 and D6 pin of NodeMCU ESP8266.

B. NodeMCU ESP8266

The ESP8266 is s low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by manufacturer Espressif Systems in Shanghai, China[3]. The chip first came to the attention of western makers in August

Implementation of Efficient Block Based Motion Estimation Algorithm using Skipping Technique

B. Prabhakar,   D. Krishna Reddy

Abstract: Block-Matching (BM)Motion Estimation(ME) algorithm is used in most of the video coding systems. The advantage offered is in terms of reduced temporal redundancy in inter frames of video sequences. Though many BM algorithms have been proposed to reduce the computational complexity of ME, the computationally cost of effective Block-Matching(BM)ME algorithm is better choice for video conferencing, video telecasting and mobile communications applications. An operationally cost effective BMME algorithm using Enhanced Summed Area Table (ESAT) with skipping technique is developed. The proposed algorithm in this paper skips more number of unnecessary operations by incorporating suitable conditions before calculating block matching distortion. Through simulation results the effectiveness of proposed algorithmis shown which effectively curtails the computational complexity of the ME with ESAT while guarantee the motion prediction quality.The results show that about 79.85% operations have been skipped or eliminated.

Keywords: Video, BMME, ESAT

I. INTRODUCTION

Video raw data Have to be stored and transmitted. However, due to limitations of storage capacity and transmission bandwidth, these numerousvideo data is be compressed before they are stored and transmitted. So, videocompression coding system has become progressively more important. BMMEA is used in several video compression systems because it can largelycurtail the temporal redundancy in inter frames of video sequences and maintaining the motion estimation quality relatively to the Full Search Algorithm (FSA). Though there areseveral algorithms that have been proposed to recede the complexity calculations of motion estimation. The computationally cost of effective block-matching motion estimation algorithm is still required for video telecasting and mobile communications. This paper presents an operationally cost effective BMMEA Enhanced Summed Area Table Method (ESATM) with skipping technique. The proposed algorithm skips a lot of unnecessary operations before calculating block matching distortion. The simulation results showed that the proposed algorithm can effectively reduce the computational complexity of the motion estimation with SATM meanwhile guarantee the motion prediction quality. The paper is divided into 5 sections. Section 2 is the related work while the proposed

work is presented in section 3 of this paper. Further section 4 and 5 discuss the simulation result and conclusion respectively.

II. RELATED WORK

For video data compression, BMA for ME is a more effective technique in video compression system. It can redundancy in a video. In the BM ME method, the frame of video sequence is firstly split into a succession of non-overlapping subblocks of size $N \times N$ .Due to its simplicity and efficacy, the BM MEA has been widely implemented by many video coding systems such asMPEG-4 and H.264/AVC. For this, the FSA is the modest ME algorithm. The best matching quality and the optimal Motion Vector (MV) can be obtained. However, since the FSA needs to comprehensively check all the candidate matching points in the search window which leads to a larger computations. So, ME reside 50 % computational weight in the current video coding. In order to curtail the computational complexity of ME and get faster the process of video coding, fast MEAs have been proposed in current years.

These fast MEAs can be classified into two important methods: (i) Method is to search templates to curtail the search points of ME [1-12]; & (ii) Method employing certain approaches to decrease the number of the calculation of the real BM distortion in the process of ME[13-21]. However, the most effective algorithm widely adopted is all-layer motion estimation (AME) search algorithm [22].
The AME is an efficient hierarchical MEA which performs ME on layers [14]. This algorithm boosts the search speed over MME by using twofold techniques namely Mean Inequality Elimination (MIE) method and an Improved Checker board Partial Distortion Search (ICPDS) approach. The MIE method is an early termination method which castoffs the unnecessary search points during ME on the layers and hence reduces the calculations of ME without any loss in the matching quality. Further to curtail the number of calculations of ME, AME has employed ICPDS scheme is adopted to compute the partial distortions on the layers.

III. PROPOSED WORK

A. Block Based Motion Estimation Algorithm with Enhanced Summed Area Table

Let A and B represent macro block and candidate block of size M X N as shown in Fig.1 (a) and (b) respectively.

Development of Raspbian kernel Customization for Automatic Railway Level Crossing Application

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ABSTRACT

In the recent years, the usage of the linux Operating System (OS) becomes very important for the real-time monitoring applications. The performance of embedded application depends on the important factors such as response time, memory size and power consumption. Among these parameters, memory size plays an vital role in kernel implementation. Customizing a general purpose OS to an application-specific OS is a challenging task for real time environments. Raspbian OS is the most recommended, open-source linux based OS for Raspberry pi board. In this paper, the customization of the Raspbian OS for automatic railway level crossing application is discussed. The novelty of this paper is to develop various algorithms for the customization of Raspbian OS and implementation of the application. The application is implemented by using Raspberry pi 3 board, IR sensors, DC motor, LED and buzzer. The railway gate is controlled by using IR sensors and DC motor interfaced through pi board. An IoT based application is to be developed for real time monitoring of the status of train and railway gate. The memory size of the Raspbian OS kernel is reduced by 42.71% after the customization.
.

Keywords—Raspbian OS, Customization, Web server, Internet of Things

I.   INTRODUCTION

Linux is an open-source operating system in which the source code of the kernel is freely available and can be customized for various applications based on their specifications. The significance of customization of the kernel is removing the unnecessary modules in order to minimize the memory size and increase the application response time [8,9]. The development of the embedded OS is very important for the IoT (Internet of things) based applications. Raspberry pi board is an OS based board which was developed by Raspberry pi foundation. It has a microSD card support mounted on it. The OS is ported into SD card ported on it. In this paper, to develop automatic railway level crossing application by using raspberry pi the necessary modules of the kernel are considered. The process of implementation of the entire setup is divided into two steps. The first step is customization of Raspbian kernel and second step is development of IoT based application for automatic railway level crossing [1,2]. In the first step, the raspbian OS kernel is cloned from the git repository and is customized by removing unnecessary modules. A customized raspbian kernel image is created and is ported into the microSD card mounted on raspberry pi board. In the second step, the raspberry pi board with customized raspbian kernel is interfaced with various components to develop automatic railway level crossing application [5,6,7]. Python language is used for the source code development of the application. An Apache web server and HTML are used for the IoT application development

II.   RASPBIAN FILE STRUCTURE

The file structure of the Raspbian OS needs to be considered for the kernel customization process. The various directories and its importance are listed below.

ARCHIVES

Augmentation of NavIC-11 with BeiDou-3 over Indian Region

 Sudershan Reddy Kotla, Sameeha Fahmeen, Quddusa Sultana and D. Krishna Reddy

Abstract

India has developed its domestic navigation satellite system called as Indian Regional Navigation Satellite System (IRNSS) which is renamed as Navigation with Indian Constellation (NavIC). NavIC-7 (with 7 satellites) provides navigation services to Indian landmass with an extension of 1500 km beyond the boundary. NavIC-11 (with eleven satellites) in future will provide an extended service, covering even polar regions. Studying the satellite visibility over Indian region is vital as it is an important parameter to analyze the accuracy of user position. To improve position accuracy, NavIC-7 or 11 can be augmented with other navigation satellite systems, such as Global Positioning System (GPS) of US, Global Navigation Satellite System (GLONASS) of Russia or BeiDou-3 of China. The BeiDou-3 is China's third generation satellite navigation system developed by China National Space Administration (CNSA). This paper focuses, on the augmentation of proposed constellation of NavIC-11 with proposed constellation of BeiDou-3 over Indian Region. Satellite visibility and the respective Dilution of Precision (DOP) values are computed and compared. Satellite visibility and DOP values are found enhanced due to augmentation.

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Comparison Study of Hamming and Kaiser Window over Band-pass Filter Banks in Cochlear Implant System

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Abstract

The cochlear implant is the successful neural prosthesis ever developed. This prosthesis is the most effective way to restore hearing purpose. The device is surgically implanted inside the cochlea (brain) to stimulate current pulses similar to neuron stimulation. The audio signal sensed through a microphone is amplified and digitized before the audio/speech signal processing. Continuous Interleaved Sampling (CIS) is one of the most important speech processing strategies used in the speech processors of Cochlear Implant. The speech processing ensures the splitting of the input signal into various frequency bands and provides the filtered signal to appropriate electrodes. The electrodes activate the auditory nerve fibers to provide hearing sensation. The focus of the paper is to design a bank of Band-pass Filters, which is used in the CIS algorithm for separating the frequencies for processing the signal and finally feeding it to different electrodes. Filters are targeted for audio frequencies from 200 to 7.5 kHz. MATLAB based Filter banks using Kaiser Window and Hamming window are considered for design. The center frequencies of the respective band-pass filters are taken into account to test the eight filters. In Xilinx ISE 14.7 Verilog based synthesis for bank of band-pass filters will be implemented.

Keywords: *CIS, FFT, FIR, IIR, LPC, RF.*

I. INTRODUCTION

A cochlear implant is an inside ear implant that can restore deeply deaf people to normal hearing [1]. Fig 1 shows a typical structure, consisting of an external part and an implant, of existing commercial cochlear implant devices. The functioning principle of the microphone is to collect environmental sounds in the outside part of the body and to transform the analog signals into digital audio with an A / D converter. The digital audio is processed by a specific algorithm that collects the data needed from the body's inside. A transmitter is used for data modulation and transmission of data and energy to the inner part of the body. In the interior part of the body, the receiver recovers the data and energy of RF signals and then decodes the data so that the stimulator can

generate electric stimuli. The audio nerves are excited and transmit the excitement into the user's brain to generate a hearing sensation.
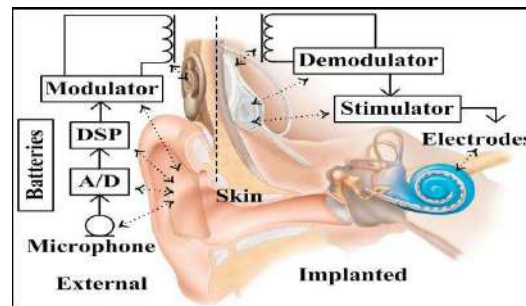
Fig 1: Typical architecture of cochlear implants

A channel vocals strategy was initially developed by the cochlear implant device inner aid produced by Symbion, Inc., Utah. The signal is first compressed by automatic gain control and then filtered in the central frequencies at 0.5, 1, 2, and 3.4 kHz [9] in four adjacent frequency bands. The filtered waveforms were simultaneously supplied in analog form to four electrodes. The interaction between channels caused by the summation of electric fields from individual electrodes is a major concern associated with simultaneous stimulation. Stimulations from other electrodes may distort neural responses to stimuli from one electrode significantly. These interactions can distort speech and thus degrade the understanding of speech. This speech processing strategy is called a Compressed Algorithm.

Researchers of the Research Triangle Institute (RTI), using non-simultaneous, interlaced pulses [10], proposed a simple solution to this problem of channel interaction. They proposed modulating the filtered waveforms by trains of biphasic pulses delivered to the electrodes in a non-overlapping (non-simultaneous) fashion, that is, in such a way that at one time, only one electrode was stimulated. The amplitudes of the pulses were derived by extracting the envelopes of the waveforms of the band-passed signals. The strategy that resulted was called the Continuous Interleaved Sampling (CIS) strategy.

Comparison of BER Performance with DFT and DWT for MIMO-OFDM System

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Abstract : OFDM is a multicarrier modulation technique which provides high spectral efficiency. There is inter carrier interference (ICI) and inter symbol interference (ISI) in OFDM because of loss of orthogonality between the subcarrier. This problem is overcome by using cyclic prefixing (CP), which uses 20% of available bandwidth. Comparison between the FFT based OFDM systems with DWT based OFDM system have been made according to QAM modulation technique over AWGN. The wavelet families are compared with FFT based OFDM system. The results confirm that the DWT based OFDM system is better in terms of bit error rate (BER) performance.

IndexTerms - **OFDM; FFT; DWT Families [Haar; DB; Biorthogonal]; BER; SNR; LTE**

I. INTRODUCTION

OFDM is a wideband wireless digital communication technique. For high data rate wireless transmission, OFDM is a popular method. OFDM is a multicarrier modulation technique which improves the spectral efficiency. Multicarrier Modulation schemes divide the original input data signal into many independent signals, which is modulated and multiplexed into the channel at different carrier frequencies such that information is transmitted on each of the sub carriers and the sub channels are nearly distortion less. In usual OFDM system, IFFT (Inverse Fast Fourier Transform) and FFT [5] (Fast Fourier Transform) are used to multiplex and decode the signal. The Cyclic Prefix is added before transmitting the signal to channel, in this system. But in wavelet based transmission technique has stronger ability of suppressing ISI and ICI than the conventional OFDM scheme. The modulation scheme used in this paper is different level of QAM modulation.

QAM is the method which combines two amplitude modulated signals into one channel. It may be an analogy QAM or a digital QAM. Two amplitude modulated signals are merged using the same carrier frequency with a 90 degree phase difference in QAM.

II.MIMO System

MIMO communication uses multiple antennas at both the transmitter and receiver to make full use of the spatial domain for spatial multiplexing and/or spatial diversity. The capacity of a MIMO link is increased by spatial multiplexing. In this, independent data streams are transmitted in the same time slot and frequency band simultaneously from each transmit antenna. And multiple data streams at the receiver differentiated using channel information about each propagation path.
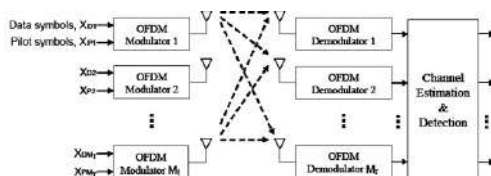
Fig 1: MIMO System Process

Channel state information (CSI) is crucial at the receiver in order to coherently detect the received signal and to perform diversity combining, in MIMO-OFDM systems. The more variable channels give more diversity. In order to obtain accurate CSI at the receiver, pilot-symbol-aided estimation must be used to track the variations of the frequency selective fading channel. Among the various resources in MIMO multicarrier systems the power assignment is related to the accuracy of the channel estimation.

Fourier Transform Based Channel Estimation:-DFT can be used simultaneously as an accurate interpolation method in the frequency domain when the orthogonality between training sequences is based on the transmission of scattered pilots.

Improvement of Ber for Mimo-Ofdm System Using Wavelet Transform

A.Vani ,Pranali Shanker Bargade

Abstract: OFDM is a multicarrier modulation technique and this technique is used with MIMO. In MIMO, multiple antennas are used at transmitter and at receiver. For achieving high spectral efficiency, OFDM uses MIMO. Because of failure of orthogonally between the sub carriers, OFDM has inter carrier interference (ICI) and inter symbol interference (ISI.) In OFDM, cyclic prefixing (CP) is used to overcome the problem. In this, BER is calculated using DWT based OFDM with QAM modulation technique over AWGN.BER is calculated for different wavelets using different levels of QAM.The performance metrics are analyzed through MATLAB simulations

Index Terms: BER SNR, QAM,, MIMO, DWT ,Wavelet.

I. INTRODUCTION

In order to reduce the errors over multipath channels MIMO-OFDM is used. It is a multi input multi output – Orthogonal frequency division multiplexing that allows great information capacity over the multipath channel. This technique is used to mitigate the fading that exists over multipath channel and provides a good quality signal [1]. In MIMO-OFDM system, the size of guard intervals is small [2] and it provides good channel fading characteristics, jamming to impulse response, constant average spectral density, spectrally high power efficient,witstand to very strong echoes,neglible nonlinear distortion.

Diversity techniques used to mitigate the fading in multipath environment over wireless channels. Space diversity is used for wireless channels and for this, many transmitter and receiver antennas used [1]. MIMO increases the fundamental gain that enhance spatial multiplexing, which causes more spectral efficienciant.

OFDM expanded as Orthogonal Frequency Division Multiplexing and uses mutually perpendicular sub carries of frequencies for signal transmission. Since subcarriers are mutually orthogonal to each other the OFDM facilitate very high bit rates in the presence of multipath radio propagation. To eliminates ISI OFDM uses spatial-multiplexing receivers which is called as MIMO-OFDM and it is provided at the cost of computational complexity. It ensures the bandwidth of subcarriers to overlap without Inter Carrier Interference (ICI) providing that modulated carriers are orthogonal.

OFDM system uses IFFT (Inverse Fast Fourier Transform) for multiplex the signals and FFT (Fast Fourier Transform) to decode the signal at the receiver. In this system, the Cyclic Prefix appended before transmitting the signal to channel. However, wavelet based transmission technique has stronger capability of suppressing ISI and ICI than the OFDM scheme. In conventional OFDM system, FFT changed with Discrete Wavelet Transform (DWT) to enhance bit error rate, interference minimization, and improvement in bandwidth efficiency.

II. RELATED WORK

Literature survey on MIMO-OFDM system using different modulation techniques, Wavelet Transforms and DWT MIMO-OFDM system presented.

In a research paper of Weijun Hong, Shufang Li [3] In this work, wavelet transform technology used for improvement of the effectiveness of image compression Whole image transformed with wavelet transform which provides very high compression ratio. No blocking effects at the stage of image recomposing as that exist in DCT In this, the draw back is, geometric distortion not filtered in extreme high compression ratio environment.

Similarly, a recent paper of Kamrul Hasan Talukder and Koichi Harada [4] presented a image transmission scheme using wavelet transform. In this, digital image transformed from spatial domain into frequency domain using discrete wavelet transform. Accuracy of the reconstructed image obtained using Haar wavelet transformation with increased transmission time.

A.Vamsidhar [5] worked on the performance of Discrete Wavelet Transform (DWT) based Multi-user MIMO-OFDM. In this, MIMO-OFDM system used for performance comparison with FFT. From the simulation, the results evaluated for bit error rate to the transmission ability.The results shows that the DWT constructed multicarrier scheme was superior to the predictable OFDM scheme. In proposed work, Daubecheis and Biorthogonal wavelets used to give more accuracy.

Pitcheri Praveen Kumar, at.el. [6] implements MIMO-OFDM system with the Wavelets have effective MRA (Multi Resolution Analysis) capabilities to extract the optimum response of the signal using DWT based OFDM. Efficiency of performance compared with the FFT based OFDM by establishing the bit error rate (BER) appearance with BPSK and QPSK as a modulation technique in the presence of AWGN channel. The proposed system uses QAM modulation technique that is immune to noise.

D.Meenakshi, S.Prabha, N.R.Raajan [7] analyses the performance of ripple based Multi-user MIMO OFDM systems and compared with a FFT based MIMO-OFDM. In this, Simulation created with DWT, Haar model and multiple antennas scheme and dual modulation schemes using BPSK and QPSK as in AWGN. For establishing presentation to the transmission ability, DWT constructed

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Design and simulation of an innovative CMOS ternary 3 to 1 multiplexer and the design of ternary half adder using ternary 3 to 1 multiplexer

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Abstract

This work intends to prove that complex ternary combinational circuits can be custom designed using the conventional CMOS technology. This work focuses on implementing specific combinational circuits i.e. ternary 3 to 1 multiplexer circuit and Ternary Half Adder circuit in the conventional CMOS technology. In the binary digital system, it is known that any combinational logic can be implemented using multiplexer and basic logic gates. The same approach holds good in ternary logic as well. As almost any ternary combinational logic can be implemented using a ternary multiplexer, In this work it is proposed to design a fully customised ternary multiplexer. The proposed 3:1 ternary multiplexer will be used to design a ternary combinational circuit namely a Ternary Half Adder. As the aim of the work is to prove the feasibility of a ternary logic design on CMOS technology, the major attention is paid on realising the functionality of the ternary combinational circuits, rather than optimizing them for power. The circuits are designed and simulated in Cadence Virtuoso using 180 nm technology.

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OPTIMIZATION OF HEURISTIC ALGORITHMS FOR IMPROVING BER OF ADAPTIVE TURBO CODES

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ABSTRACT

The third component introduced in the turbo codes improved the code performance by providing very low error rates for a very wide range of block lengths and coding rates. But this increased the complexity and the parameters such as permeability and permittivity rates were constant and they could not perform well under noisy environments. This drawback was addressed in [1] by proposing A3D-TC. The bit error rate was minimized by generating parameters based on noise and signal strengths. A performance comparison is done between the two heuristic algorithms i.e., Genetic Algorithm and Particle Swarm Optimization Algorithm [2] where a knowledge source using the two algorithms is generated. Under various noisy environments the experimental results compare the performance of the two algorithms. In this paper their performance is analyzed and optimization is done. The results show that genetic algorithm is able to give better performance when compared to particle swarm optimization algorithm.

Keywords: A3D-TC, Genetic Algorithm, optimization, permeability, permittivity rate, Particle Swarm Optimization Algorithm

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1. INTRODUCTION

Error control coding plays a pivotal role in ensuring reliable communication. It is used to improve the efficiency and accuracy of transmitted information. It is a technique used in signal processing for correcting errors in the channel. If the signal is in error, then the communication system is unreliable. The elemental concept of error control coding is the addition of redundancy which converts the transmitted bits to a longer sequence of bits (codeword) to combat errors introduced by the noise in the channels. The redundancy is added at the transmitter and the exploitation of this redundancy is done at the receiver to detect and / or correct errors.

The exceptional error performance and energy efficiency at low signal to noise ratio can be achieved using Forward Error Correcting codes (FEC). It is the mechanism used for error

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Implementation and Testing of LTE Transmitter in Lab VIEW

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ABSTRACT

Long Term Evolution (LTE) is a prominent project of 3rd Generation Partnership Project (3GPP). LTE, as a revolution from the 3rd generation (3G) to the 4th generation (4G) cellular communication, has achieved great capacity and high speed of mobile telephone networks. It has defined a new packet-only wideband radio with flat architecture and assumes a full Internet Protocol (IP) network architecture in order to assure voice supported in packet domain in design. In addition to that, it is combined with top-of-the-line radio techniques in order to gain better performance than Code Division Multiple Access (CDMA) approaches. LTE uses OFDM (Orthogonal Frequency Division Multiplexing Access) technology which can provide high-degree resilience to reflections and interference at the same time. For the downlink OFDMA is used and for the uplink SC-FDMA (Single Carrier- Frequency Division Multiplexing Access) is used which has the advantages of smaller peak to average power ratio. In this paper, it is proposed to present the overall description of LTE technology and to simulate the LTE Transmitter using LabVIEW (v2017)software.

KEYWORDS: LTE, Downlink, Uplink, OFDMA, SC-FDMA, MIMO.

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Performance Analysis of Energy Efficient S- Leach under Data Compression Technique to Improve Network Life Time by Using Ns-2.35

M. Devaraju, A. V. Narasimha Rao,

ABSTRACT: Wireless Sensor Networks (WSN) have increased expanding consideration from both the examination network and genuine clients. The productive utilization of the energy source in a sensor node is a vital foundation to delay the valuable existence of the wireless sensor network. Wireless sensor systems have investigated numerous new protocols planned explicitly for sensor systems where the thought of power is vital. The best significance, given the various leveled directing conventions reliant on bunching, has better flexibility. Since the sensor hubs are for the most part battery-worked gadgets, the basic viewpoints that must be tended to are the means by which to decrease the power utilization of the nodes, with the goal that the system's network life can be stretched out to sensible times. There are a few protocols of hierarchical routing of low power utilization, among which is the acclaimed LEACH protocols, we copy LEACH in NS2 and explore the execution of LEACH similar to vitality, execution and system life.

Key words: LEACH, Drain, various leveled directing calculations, gathering, Wireless sensor systems

I.   INTRODUCTION

Wireless Sensors Networks (WSN) are a lot of hundreds or thousands of micro sensor nodes that have location abilities, set up wireless correspondence with one another, and perform handling and preparing tasks. The critical prerequisites [1] of a WSN are:
 (1) Use of countless sensors
(2) Connection of stationary sensors
 (3) Low power utilization
(4) Self-association limit
(5) Collaborative preparing of signs, and (6) querying ability.
 A portion of the vital application spaces of WSN are listed below.
Military condition, Catastrophe the board Living space checking Restorative and social insurance, Mechanical fields, home systems. Organic, radiological, atomic, touchy material and so forth.
The sensor nodes are furnished with little batteries, frequently key, with constrained power limits. They can be executed physically or they can be dropped indiscriminately. They are self configuration, which contains at least one sensor, with incorporated wireless correspondences and data handling segments and a constrained power source.

The utilization of wireless sensor systems expands step by step, however the issue of power confinements wins since the battery life is constrained. To spare the energy dissemination brought about by correspondence in remote sensor systems, it is important to program the condition of the sensors, change the transmission run between the detection nodes, use data routing techniques and efficient data routing and keep away from the treatment of undesirable information. When all is said in done, routing in WSNs [2] can be partitioned into level, hierarchical, and locationbased routing, contingent upon the structure of the system. Hierarchical routing is a notable method with uncommon focal points identified hierarchy system protocol (LEACH) for sensor with adaptability and efficient correspondence. Drain, PEGASIS, TEEN [3] and APTEEN utilize this procedure to course. In the hierarchical engineering, higher-power nodes can be utilized to process and send data, while low-power nodes can be utilized to perform identification in the region of the objective. Location based routing routings, for example, MECN sensor nodes [4] are tended to by methods for their areas. The separation between neighboring nodes can be assessed based on the powers of the approaching sign. The general directions of the neighboring nodes can be acquired by trading said data between neighbors. The low power versatile clustering hierarchy (LEACH) is a cluster based routing. In this archive, Segment **2** will present the S-LEACH routing in detail, Location **3** spread the reenactment of the LEACH routing and Segment **4** demonstrate the reproduction investigation by shifting the level of gathering heads in the system in every recreation of the LEACH routing . The execution is dissected as far as valuable life, control dispersal and system execution and Section **5** finishes up this record.

II.   LEACH ROUTING

W. R. Heinzelman et al. 5 [69] proposes a low power versatile clustering systems, which limits power dissemination in sensor systems. It is a well known various leveled steering algorithm for sensor arranges that makes gatherings of sensor nodes as per the power of the intensity that is appeared in figure 1. 5% of the complete number of hubs turns into the leader of the group that goes about as a router to the sink. The power utilization is lower since the transmission may be done per bunch head. The merging and aggregation of data are local to the cluster.

Design of Voltage Regulator for High Speed Applications

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Abstract- This paper gives a solution to enhance the transient behavior of a voltage regulator. A voltage regulator works as a power efficient way of stepping down an external supply voltage to the desired internal core supply voltage. The most important and critical block of a voltage regulator is the final output stage (i.e. driver stage). For a good transient response performance, the driver stage must have reasonably good bandwidth, which is obtained by adding dynamic leaker at the driver stage. It is designed in Cadence Virtuoso Schematic Editor and simulated by using Cadence Virtuoso Spectre Circuit Simulator tool targeted to be fabricated on TSMC 0.18μ process. The voltage regulator generates 1.9v from 3.3v external supply and the load current varies from few hundred mA to close to zero mA. The proposed circuit is particularly useful for low power high speed applications.

Keywords- Bandgap reference, Error Amplifier, Cadence, Transient, simulation.

I. INTRODUCTION

The present research relates generally to high performance voltage regulator designs, and more particularly pertains to high performance voltage regulator designs which have settling times which are fast enough to meet today's microprocessor/ microcontroller requirements [1] when they are entering an active mode from a passive mode. A chip with a voltage regulator can be operated with a single external power supply. More than one level of internal power supply voltage can be generated for different applications in different operating modes. Using a lower power supply voltage reduces power consumption by the circuit. Moreover, a voltage regulator regulates the supply voltage such that it becomes relatively insensitive to external power variations.

Voltage regulator is more suitable for microprocessor/ microcontroller applications because its internal voltage supply is regulated by a differential amplifier. When entering an active mode, a microprocessor/microcontroller will instantly draw a large amount of current. It typically takes more than 3 clock cycles for the voltage regulator to settle the internal voltage. A voltage regulator is provided for controlling a voltage generator which produces a boost voltage across a charge reservoir for supply to one input of a plurality of word line drivers in a memory array.

The voltage regulator includes a bandgap reference generator, a first differential circuit[2],[3] for producing a transition voltage from the reference voltage and the power supply voltage, a first transistor for comparing the power supply voltage with the boost voltage, a second transistor for comparing the transition voltage with the reference voltage and a latching comparator for equating the signal outputs from the first and second transistors so as to define a control signal for the voltage generator. Along with further specific details of the voltage regulator, a preferred bandgap reference generator is described.
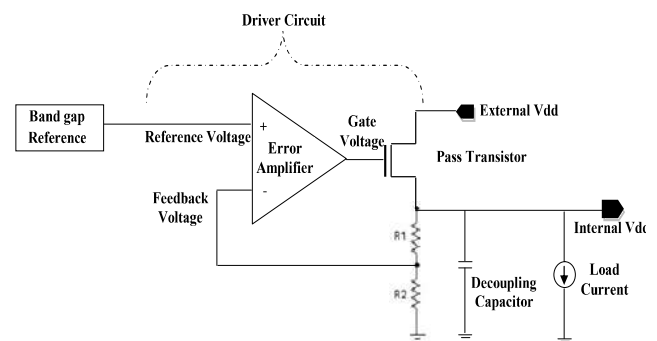
Fig.1: Block diagram of Voltage Regulator

Voltage regulator block diagram is shown in figure1. The main blocks of a voltage regulator are bandgap reference circuit followed by the driver circuit. The bandgap reference generates a temperature compensated stable reference voltage. The driver circuit consists of an error amplifier (i.e. a gain stage in the feedback loop) and cmos pass transistor. The amount of de-coupling capacitor available in regulator is less due to area constraint.

In general for high speed applications the circuit runs at high frequencies and the circuit transit from one mode to another mode in a fraction of nanoseconds time. So, the load current of the regulator also varies from few hundred mA to almost zero mA in a fraction of nanoseconds time. At negative temperatures zero mA load current is possible, where the circuit leakage current is almost negligible. In that condition, whenever the circuit switches from select mode to deselect mode, the pass transistor turns off, for a small duration of time, due to voltage fall in the gate voltage node. If the circuit switches again to the select mode, during the time when nmos pass transistor is off, internal Vdd falls much below than its specified lower limit. To eliminate this problem, dynamic leaker circuit is added at the internal Vdd node to obtain fast transient response.

II. DESIGN OF REFERENCE GENERATOR

Many integrated circuits require a stable reference voltage for their operation. Bandgap-voltage references are commonly used

PERFORMANCE VERIFICATION OF 3D TURBO CODE AND A3D TURBO CODE USING NOISE ADAPTIVE APPROACH FOR BER PERFORMANCE

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Abstract: The parameters such as permeability and permittivity rates are made adaptable to noisy environments in A3D-TC. A Genetic Algorithm (GA) based knowledge source is generated and fed to feed forward neural network. The bit error rate is minimized by generating parameters based on noise and signal strengths. In this paper, the performance verification of 3D-TC and A3D-TC using noise adaptive approach method is shown.

Index Terms: **A3D-TC, Genetic Algorithm, permeability rate, permittivity rate, special intelligence, neural network.**

I.   INTRODUCTION

In a communication system, it is evident that the information requires different levels of protection against noise as the information consists of number of parts that have different degrees of significance [1]. Thus in the information received over the channels, it is vital for communication systems to have sufficient means to detect and correct errors. However its performance is improved by channel coding. It helps in withstanding the effects of various channel impairments such as noise, interference and fading. Channel coding is partitioned as waveform coding and structured sequences. Waveform coding deals with transforming waveforms into better waveforms to make the detection process less subject to errors. Structured sequences deals with transforming data sequences into better sequences having structured redundancy. These redundant bits are used for the detection and correction of errors.

So, a major concern in digital communication system is to develop error correcting technique that covers the gap between the performance of practical communication systems and the ideal channel capacity. In wireless based digital communication systems, Forward Error Correction codes (FEC) or channel codes have become inevitable [2]. This helps in getting the desired quality of service over the link within the limited power or antenna gain available. Convolution and block codes are the two types of FEC codes [3]. They have many vital properties such as subsistence of efficient encoding and decoding algorithms and their remarkable performance over an additive white Gaussian noise (AWGN) channels [4]. The use of FEC codes in communication system is an integral part of ensuring reliable communication at lower SNR ratio [3] and also in fibre communications these codes have become a practical solution in improving system capacity [5].

In the mid-90s, turbo codes marked the beginning of a large number of research work addressing the analysis, design, and application of iterative decoding in digital communications [6]. Shannon limit is the theoretical limit of maximum information transfer rate [7] over a noisy channel. Turbo codes are the only codes that are very close to the Shannon Limit. It has also been proved that these codes offer remarkable performance especially over low SNR domains. They achieve a bit error probability of 10^{-5}, using a rate ½ code over an AWGN channel at E_b/N_0 of 0.7dB.

However the design of turbo codes was conducted with limitations at every instant [10]. The introduction of third component in the conventional turbo codes seems to be very effective in improving the code performance [11],[12],[13].

II.   THE ADAPTIVE THIRD COMPONENT

Turbo Codes

The performance of the code was improved for a wide range of block lengths and coding rates with very low error rates by introducing a third component in conventional turbo codes [8]. But the parameters such as permeability and permittivity rates were static under noisy environments and hence their adaptability to noisy environments was poor. The drawback of 3D-TC is overcome by A3D-TC by making the parameters adaptable to noisy environments. The error correction capability was improved in the proposed A3D-TC by having the special intelligence (SI) [8]. It decides the permeability and permittivity rates of the third component encoder. SI is tuned in two major steps namely (i) generating GA-based knowledge source and (ii) Knowledge feeding. Once tuned, the encoder generates third component parameters dynamically according to the noise variance.The block diagram of A3D-TC encoder and decoder is given in Fig. 1 and 2.

The conventional third component decoder is not disturbed by the addition of special intelligence [9], which is given in Fig. 2. Here, the feed forward neural network is used as the special intelligence. The structure of neural network is given in Fig. 3.

Analysis of A3D-TC for Improving Bit Error Rate

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Abstract: Turbo codes and 3Dimensional turbo codes are conventional error correcting codes but A3D-Turbo Codes are adaptive codes. A3D-TC is the improvement over 3D-TC, where the parameters like permeability and permittivity are made adaptive by using Genetic Algorithm based knowledge source. Here the parameters are made adaptive by varying noise signal. The results generated show that A3D-TC using GA is more efficient and robust and can be used to control errors in mobile communication.

IndexTerms-**Error correcting codes, Turbo codes, 3D-TC, permeability, permittivity and Genetic algorithm.**

I.   Introduction

Introduction of error control codes in various communication systems improve the efficiency and accuracy of the transmitted information. The coding used for controlling errors has always been a crucial part in the design of modern communication and digital storage systems. There are many similarities in the transmission and storage of digital information. The main being transfer of data from source to destination.

Forward Error Correction (FEC) is often used for error protection and to improve the reliability of transmission [1]. The incoming data is split into blocks containing many bits and each possible data block is mapped to another block of n code symbols, called a code word which is transmitted over a channel. The set of code words and their mapping to data blocks is called a code or FEC. Convolution codes and Block codes are the two types of FEC codes [2].

The use of FEC codes in communication system is to ensure reliable communication and these codes have become inevitable in wireless based digital communication systems as they allow the system to operate at lower SNR ratio [3].

II.   Evolutionary Algorithms (EA)

In the beginning of computerization, Computers were used for defense purposes like deciphering the military code and tracking missiles and also for betterment of mankind which was possible by modeling the human brain, mimicking human learning and stimulating biological evolution. However, these activities became insignificant over a period of time as computerization was only seen as business data processing. The research community started prioritizing them in their research. Researchers concentrated on the growth of neural networks, machine learning and evolutionary computation which is well represented by Genetic Algorithm.

Evolutionary Algorithms are the most accepted and widely researched algorithms. They are non-traditional optimization techniques which mimic the process of evolution and correspond to biological systems which can be used in engineering. These algorithms form a group of iterative stochastic search and optimization methods, based on optimization strategies and operate with a population of artificial individuals. The objective function is carefully selected and used and the encoded (artificial) individuals are evaluated and a fitness value is assigned to each individual.

III.   Genetic Algorithm (GA)

Genetic Algorithms are well known for finding minima within search spaces. They converge very quickly to these minima. In GA the logic is based on natural selection and works on the concept of survival of the fittest. The main advantage of Genetic Algorithm over the many traditional algorithms is its super convergence to global optima. The main goal of optimization is to always keep on improving the performance to reach some optimal point.

The GAs are simple yet provide an adaptive and robust optimization methodology [4].

Basic Genetic Algorithm

- A trial solution is used which has a population of 2n to 4n (n represents number of variables).
- Corresponding to the chromosomes, each solution is usually represented by a string of binary (decimal can also be taken but binary is more preferable) variables in genetics.
- In order to achieve the desired accuracy, the string length can be increased as large as possible to achieve desired fitness.
- In genetics, the numerical value of objective function represents the concept of fitness.

IV.   Need for A3D-TC

The addition of third component [5] in conventional turbo codes proved to be extremely efficient in enhancing better code performance. But permeability and permutation rates do not vary with changing noise or they remain static in this three dimensional turbo codes. Hence they become challenging when working under different noisy environments. The block diagram of 3D-Tc is shown in Fig:1.

Performance Comparison of A3D Turbo code with other Turbo codes using Noise adaptive approach

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Abstract-The performance of the code was improved for a wide range of block lengths and coding rates with very low error rates by introducing a third component in conventional turbo codes. But the parameters such as permeability and permittivity rates were static under noisy environments and hence their adaptability to noisy environment was poor. The proposed A3D-TC has overcome the aforesaid problem. The parameters are made adaptive by generating a Genetic Algorithm (GA) based knowledge source. The bit error rate was minimized by generating parameters based on noise and signal strengths. This paper compares A3D-TC and 3D-TC along with other turbo codes like DVB-RCS-TC and 16 state DB-TC.

Key words- *A3D-TC, Genetic Algorithm, permeability rate, permittivity rate, 3D-TC, DVB-RCS-TC, 16 state DB-TC.*

I. INTRODUCTION

Wireless Mobile communication is one of the fastest growing fields in the telecommunication industry. They provide access to the capabilities of the global network at any time, irrespective of the location or mobility of the user. Due to the progress of Internet and cellular communication, the present and future mobile communication for data transmission is done at high bit rates which is used for many services like video, high quality audio and also many network related applications.

In this regard, communication system plays a vital role which consists of concatenation of modulation, a noisy medium, and a demodulation scheme [1]. The information here, is transferred with the aim of achieving reliable communication at transmission rates approaching channel capacity given by Shannon and is known as Shannon limit. So, to ensure reliable communication, E_b / N_o should be maintained at -1.6dB irrespective of how powerful an error

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control code is.   The information has to be protected from the errors introduced in the communication channel. The information sequence that has to be transmitted may consist of several parts that have different degrees of significance and hence require different levels of protection against noise. This protection is done by a method called coding, where information is disguised by using different codes. Therefore the role of error correction codes becomes more prominent.

Forward Error Correction (FEC) has been a commonly used mechanism for error protection and also to improve the reliability of transmission [2]. The use of FEC codes in communication system is an integral part of ensuring reliable communication and these codes have become inevitable in wireless based digital communication systems as they allow the system to operate at lower SNR ratio [3].

II. THE ADAPTIVE THIRD COMPONENT TURBO CODES (A3D-TC)

In A3D-TC,as shown in Fig. 1. The third component parameters are made adaptive. This is accomplished by generating a Genetic Algorithm (GA) based knowledge source and feeding it to feed forward neural network [4]. The network outputs third component parameters according to the noise and signal strengths so that bit error rate at decoding section can be minimized in an effective way. The permeability and permutation rates are found with respect to the different noise strength. The data so obtained is utilized to train Artificial Intelligence (AI).

The block diagram of A3D-TC encoder and decoder is given in Fig. 1 and 2.

Validation of Heuristic Algorithms for improved BER performance

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ABSTRACT:*The performance of the code was improved effectively by introducing the third component in conventional turbo codes. But their adaptability to the varying noise environments was very poor. This degraded their performance in achieving the low bit error rates. To overcome the aforesaid drawback Adaptive third dimension turbo code was proposed in our previous paper [1]. The parameters were made adaptive by generating genetic algorithm based knowledge source. In [2] comparison was made between Genetic algorithm and Simulating Annealing algorithm. In this paper the performance analysis and validation is done between these two algorithms. The analysis showed that genetic algorithm is able to give better performance when compared to simulated annealing algorithm.*
KEYWORDS: *Knowledge feeding, Adaptability, Genetic algorithm, Simulated Annealing, error rates, third component, Turbo codes.*

I. INTRODUCTION

To withstand the effects of various channel impairments such as noise, interference and fading channel coding is done which improved communication performance. Channel coding is divided as waveform coding and structured sequences. Waveform coding deals with transforming waveforms into better waveforms to make the detection process less subject to errors. Structured sequences deals with transforming data sequences into better sequences having structured redundancy. The detection and correction of errors is done by these redundant bits.
A major concern in digital communication therefore is to develop error correcting technique that covers the gap be-tween the performance of practical communication systems and the ideal channel capacity.
Forward Error Correction codes (FEC) or channel codes have become inevitable [3] to get the desired quality of service over a link in wireless based digital communication systems. This helps the system to operate at lower signal to noise ratio within a transmit power or gain thereby achieving the desired quality of service.The use of FEC codes in communication system is an integral part of ensuring reliable communication [4].
In mid 90's when Turbo code was introduced, it marked the beginning of a lot of research work addressing the analysis, design and application of iterative decoding in digital communication [5]. Turbo codes performance is very close to the limit of Reliable communication given by Shannon Limit. It has also been proved that these codes offer remarkable performance over low SNR domains. They achieve a bit error probability of 10^{-5}, using a rate ½ code over an AWGN channel at $Eb/N0$ of 0.7dB.

II. the adaptive third component turbo codes(a3d-tc)

The error correction capability is improved to a certain extent by the proposed A3D-TC by generating the special intelligence (SI), where the permeability and permittivity rate of the third component encoder is decided. Tuning is done by generating knowledge source and then by knowledge feeding using both Genetic Algorithm and Simulated Annealing Algorithm. Once tuning is completed the third component parameters are generated dynamically according to the noise variance. The block diagram of A3D-TC encoder and decoder for the heuristic algorithms is given in Fig: 1 and 2.

FEATURE EXTRACTION OF HISTOPATHOLOGICAL IMAGES OF SKIN TISSUES USING MORPHOLOGICAL OPERATIONS

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Abstract: Skin cancer is the most common of all human cancers, with 1 million people in the U.S. diagnosed each year with some type of the disease. Melanoma accounts for only about 1% of skin cancer but causes a large majority of skin cancer deaths. So early diagnosis plays an essential role in control and cure of the disease. Different histology patterns of skin cancer are important for proper diagnosis and treatment of skin malignancies. In this paper different features like Nuclear-cytoplasm ratio, number of nuclei and pleomorphism or nuclei size variance of skin tissues are extracted and these features can be used for classifying the images weather they are malignant or normal tissues. So this system can be used to assist the pathologist to increase the efficiency of our health care system.

IndexTerms - **Skin tissues, Features extraction, Artificial neural networks,** Nuclear-Cytoplasmic ratio (NCR).

I. INTRODUCTION

Cancer occurs when normal cells undergo a transformation and grow and multiply without normal controls. Cells multiply; they form a mass called a tumor. Tumors are cancerous only if they are malignant. They may also travel to remote organs via bloodstream and spreading to other organs is called metastasis. There are three major types of skin cancers: basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma. The first two skin cancers are grouped together as non-melanoma skin cancers. A small but significant number of skin cancers are malignant melanomas. Malignant melanoma is a highly aggressive cancer that tends to spread to other parts of the body. These cancers may be fatal if not treated early. So there is a necessity to detect the cancer at an early stage.

II. LITERATURE REVIEW

Automatic skin cancer images classification by Mahmoud Elgamal [1] proposed feature extraction by wavelets. In this features are extracted by 3 level discrete wavelet transform and then feature reductionis done using PCA i.e principal component analysis. The image is passed through filter bank .At first level there are 4 sub-band (LL,LH,HH,HL) images at each level. The sub band LL is used for the next 2D DWT. Thus wavelets provide a simple framework for interpreting the image information. In this algorithm, level-3 decomposition was utilized to extract the features.

Saban Ozturk and Bayram Akdemir [2] proposed feature extraction and classification methods for histopathological images using different algorithms like GLCM,LBP,LBGLCM, GLRLM and SFTA. The extracted features are applied to different classifiers like SVM, KNN, LDA and Boosted tree. These classifier output will give weather the tissue is cancer or normal tissue.

III. METHODOLOGY

In this paper, first preprocessing is done to segment [3] the images using morphological operations like dilation and erosion. Then features are extracted from these images and then can be implemented with supervised machine learning technique i.e. feed forward back propagation artificial neural network is used as a classifier. The below figure shows the process of how the image can be classified as normal tissue or it's a cancer tissue.

VOICE CONTROLLED ROBOTIC ARM FOR KITCHEN APPLICATION

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Abstract : A robotic arm is a programmable mechanical arm that is comprised of segments connected by rotary and linear joints. These joints allow for controlled movement. Initially the use of robotic arms was primarily confined to industrial applications like assembling cars in automobile industry. But now with the advancements that have been made in the field of robotics their use for domestic needs is also gaining momentum. One such proposition is to build a fully automated kitchen powered by robotic arm. This project tries to contribute to that very idea by acting as one of the stepping stones. This work is intended to help mothers in particular and amateur cooks who mainly follow recipes in general. In this a robotic arm is proposed to be designed and implemented to assist a cook by readily providing her/him with various ingredient containers from shelves on just a voice command. Here the Arduino is going to control servo motors which drive the joints of the robotic arm. The cook's voice commands are given to the Arduino via a Smartphone over a Bluetooth network. The cook just needs to utter the names of the ingredients specified in the recipe in order and subsequently the arm picks up the respective ingredient container and places it infront of her/him.

IndexTerms - **Robotic arm, Ardunio UNO**

I. INTRODUCTION

A robotic arm is a type of mechanical arm , usually programmable, with similar functions to a human arm; the arm may be the sum total of the mechanism or may be part of a more complex robot. The links of such a manipulator are connected by joints allowing either rotational motion or translational (linear) displacement. The links of the manipulator can be considered to form a kinematic chain. The terminus of the kinematic chain of the manipulator is called the end effector and it is analogous to the human hand.

The end effector, or robotic hand, can be designed to perform any desired task such as welding, gripping, spinning etc., depending on the application.

II. LITERATURE REVIEW

A project done by C. W. Chen *et* al [1] presents a design of controlled robotic arm with myo electric and body action signals. The implementation uses the sensed signals, via the signal processing of ARDUINO UNO R3 development board and NUC140VE3CN development board (ARM processor), to control the robotic arm wirelessly. The proposed design can be used in the dangerous operation environment. The users can contact less control the robotic arm safely. And it can operate specified action repeatedly and accurately for factory manufacture. The rotative angle of robotic arm controlled by Servomotor is decided by pulse width modulation signal obtained from microcontroller via Bluetooth 4.0 wireless technology. The pulse width modulation signal obtained from microcontroller is decided by the sensors located on the human's arm or sensor glove.

A project done by McMorran, Darren *et* al [2] represents a Flexible automation systems which provide the needed adaptability to serve shorter-term projects and specialty applications in biochemical analysis. A low-cost selective compliant articulated robotic arm designed for liquid spillage avoidance is developed here. In the vertical-plane robotic arm movement test, the signals from an inertial measurement unit (IMU) and accelerometer were able to sense collisions. In the horizontal movement test, however, only the signals from the IMU enabled collision to be detected. Using a calculation method developed, it was possible to chart the regions where the obstacle was likely to be located when a collision occurred. The low cost of the IMU and its easy incorporation into the robotic arm offer the potential to meet the pressures of lowering operating costs, apply laboratory automation in resource-limited venues, and obviate human intervention in response to sudden disease outbreaks.

III. METHODOLOGY

Fig 1 shows the block diagram corresponds to controlling circuitry that controls the rotation of motors positioned at different places of a Robotic Arm. Motors are used to control the movement of Arm, one for shoulder, one for elbow and two motors are used to hold the object.

A Sturdy Nonlinear Hyperspectral Unmixing Algorithm Using Iterative Block-Coordinate Descent Algorithm

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Abstract: To depict the hyperspectral data, here a sturdy mixing model is implemented by employing various perfect spectral signatures mixture, which enhances the generally utilized linear mixture model (LMM) by inserting an extra term that describes the potential nonlinear effects (NEs), which are addressed as additive nonlinearities (NLs) those are disseminated without dense. Accompanying the traditional nonnegativity and sum-to-one restraints underlying to the spectral mixing, this proposed model heads to a novel pattern of sturdy nonnegative matrix factorization (S-NMF) with a term named group sparse outlier. The factorization is presented as an issue of optimization which is later dealt by an iterative block-coordinated descent algorithm (IB-CDA) regarding the updates with maximation-minimisation. Moreover, distinctive hyperspectral mixture models also presented by adopting the considerations like NEs, mismodelling effects (MEs) and endmember variability (EV). The extensive simulation analysis by the implementation of proposed models with their estimation approaches tested on both the synthetic and real-time images. Further, it is also shown that the comparative analysis with the conventional approaches.

Keywords: Spectral unmixing, Hyperspectral images, Linear mixture models, Nonlinear mixture models, Nonlinear spectral unmixing, Endmember variability, Sturdy unmixing, Mismodelling effect and coordinate descent algorithm.

1. Introduction

Hyperspectral image investigation, which renders significant and comprehensive gathered measurements description in several areas of application like spectro-microscopy [1], remote sensing [2], food monitoring [3] and planetology [4] is done by a prefaced concern problem named as spectral unmixing (SU), which was an area of intensive interest over the last two decades. SU is an issue of separating source comprising of reconstructing the material's endmember spectrum which is there in the scene and measuring their symmetries or abundances inside every pixel of HIS. It consists in decomposing P multi-band observations $Y = [y_1, \ldots, y_P]$ into a collection of K individual spectra $R = [r_1, \ldots, r_K]$, called

endmembers, and estimating their relative abundances $A = [a_1, \ldots, a_P]$ for each observation [5, 6]. Numerous SU approaches presented in the literatures of geoscience, signal and image processing depends on LMM, $Y \approx RA$. In truth, a good estimation of the physical procedure is rendered by LMM which inherent the observation and has outcome in practicable solvent for numerous applications. Be that as it may, LMM is not suitable for several settings like the models with volumetric dispersing or suggest materials mixture or terrain alleviation. For example, when assuming the scenes like arenaceous, light is mattered to the development of multiple dispersing and assimilation, that led largely NEs. Quite difficult optical modelling is necessitated to deal with the thorough examination of such models and further it is required to recourse

Simulation of Adaptive Third Component Turbo Codes using Genetic Algorithm

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Abstract: Detection and correction of errors has become an essential part of any communication system. Over the years, error correction codes have been proposed, that work towards reaching the Shannon Limit. Among all the ones proposed, Turbo codes are the only codes that approach the Shannon Limit. The bit error rate is taken as the criteria and always an attempt was made to minimize it. The bit error rate while using 3D Turbo Codes[2] was improved compared to conventional turbo codes. To achieve better results, Adaptive 3D-TC have been proposed [1] and compared to 3D TC. It is observed that for majority of cases, BER was less. In this paper, the signal to noise ratio is further increased and the corresponding BER values are calculated.

Key words: Shannon limit, Adaptive 3D-TC, Turbo codes, 3D-TC, Bit error rates.

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Introduction

Wireless Mobile communication occupies very important role in telecommunication industry and is fastest growing field. It provides access to the global network at any time irrespective of the location or mobility of the user. Due to the progress of Internet and Cellular communication, mobile communication has become indispensable. The future mobile communication requires transmission of data to be done at higher bit rates which are used for many services like image and signal processing and also many network related applications. Ideally, the information is to be transferred to the destination from the source without compromising on quality of the message which should be preserved. In this regard, communication system plays a vital role. Digital information is altered by modulator into analog waveforms. They are transmitted through a noisy medium. Subsequently, they are changed back into symbols in a sequence at receiver by the demodulator. The information is transferred with the aim of achieving reliable communication at transmission rates approaching channel capacity given by the Shannon limit. The information sequence that is to be transmitted consists of several parts that have different degrees of significance. Hence, there is a need for different levels of protection against noise. As the information is transmitted over the communication channel, presence of noise in the channel result in errors in the sequence. The information has to be protected from occurrence of errors. Protection is done by a method called coding or channel coding, where information is disguised using different codes.

Codes are the set of symbols to which meanings or values are attached and are designed to provide different levels of data protection. Hence, the role of error correction codes becomes more prominent. Introduction of error control codes improve the efficiency and accuracy of the transmitted information. Therefore, the coding used for controlling errors has become crucial part in the design of modern communication and digital storage systems. The elemental concept of error control coding is the addition of redundancy at the transmitter, which converts the transmitted bits to a longer sequence of bits (codeword) to combat errors introduced by the noise in the channels. The exploitation of this redundancy is done at the receiver to detect and / or correct errors.

A modified turbo code called Three-Dimensional Turbo Codes (3D-TC) has been chosen in the research for further improvement. Third component is introduced in traditional turbo codes which improved the code performance. In 3D-TC, the parameters such as permeability and permutation rates are constant. Under different noisy environments the permeability and permutation rates remain static and affect the performance. To address the problem, 'Adaptive third component Turbo Code (A3D-TC)' [1] is proposed in which the parameters are made to vary with different noisy environments.

The Adaptive Third Dimensional Turbo Codes

In A3D-TC, as shown in Fig: 1. the third component parameters are made adaptive. This is accomplished by generating a Genetic Algorithm (GA) based knowledge source and feeding it to feed forward neural network. The network outputs third component parameters according to the noise and signal strengths so that bit error rate at decoding section can be minimized in an effective way. The permeability and permutation rates are found with respect to the different noise strength. The data so obtained is utilized to train Artificial Intelligence (AI).

Genetic Algorithm: An Adaptive Approach to Improve BER in Turbo Codes

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ABSTRACT

This paper tells the importance of Genetic Algorithm in error correcting codes from different point of view. As a matter of discussion, Turbo codes, 3D Turbo codes and A3D Turbo codes have been selected. 3D-TC is the development over Turbo Codes and A3D-TC are improvement over 3D-TC, where the control parameters, permeability and permittivity are made adaptive by using Genetic Algorithm based knowledge source and feeding it to feed forward neural network. Extensive experimental results prove the performance of A3D-TC over the conventional 3D-TC under various noisy environments and can be used to control errors in mobile communication.

Keywords—*Turbo codes, 3D-TC, A3D-TC, Neural Network, knowledge source, parameters, adaptive, permeability, permittivity, Genetic algorithm.*

I. INTRODUCTION

Introduction of error control codes in various communication systems improves the efficiency and accuracy of the transmitted information. Hence the coding used for controlling errors has always been a crucial part in the design of modern communication and digital storage systems.

II. How Does An Error Occur

The error may occur in many ways depending on the message signal transmitted through the channel.

For example
If the message is in the form of bits

Transmitted data bits 10001101100100111010

Received data bits   10100110100100011010

The underlined bits indicate that they are in error.

Figure 1 below shows how the signal is transmitted from the transmitter to the antenna and then received at the receiver. The signal received is a corrupted signal.
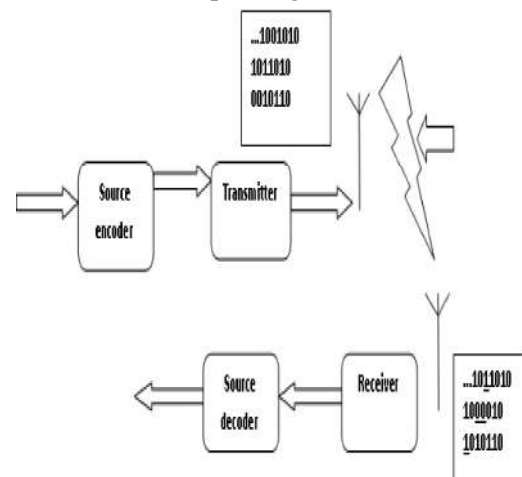
Figure: 1. Model of Text message

DEEP LEARNING BASED FIRE FIGHTING ROBOT

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Abstract— **With the advent of technology, humans are replaced with robots in life-threatening situations. Fire accidents are one of the major mishaps threatening the human lives. The project aims to design a robot capable of detecting and suppressing fires. The robot is capable of seeking the location of fire over a defined region and mitigate it before it runs out of control. It can also send the images of fire to the concerned user alarming them. This can be achieved efficiently using a Deep Learning concept called Computer Vision. The proposed model can find its applications in domestic as well as industrial premises.**

Keywords—Deep Learning, OpenCV, Fire Fighting, Raspberry Pi, Haar Cascade, SMTP.

I. INTRODUCTION

In our day-to-day life, fire accidents have become common and sometimes may lead to hazards that make it hard for the firemen to protect human life. In such cases, a fire fighting robot is used to guard human lives, wealth, and surroundings from the fire accidents. The present-day systems only rely on the output from the analog sensor whose values are not precise and tend to fluctuate easily. Hence relying on these sensors for emergency won't be effective. So efforts were put to use the concept of Computer Vision in this project. Computer vision is an interdisciplinary scientific field that deals with how computers can be made to gain high-level understanding from digital images or videos. It is a branch of Artificial Intelligence (AI) technology that has already entered our lives and businesses in ways many of us may not be aware of. From the perspective of engineering, it seeks to automate tasks that the human visual system can do.

II. DESIGN CONCEPT:

The robot captures the images of surroundings continuously and process Deep learning. Whenever fire is detected the robot activates fire extinguishing module attached to it and also alerts the user through email. On top of that it should send Email alert to the owner of the robot.
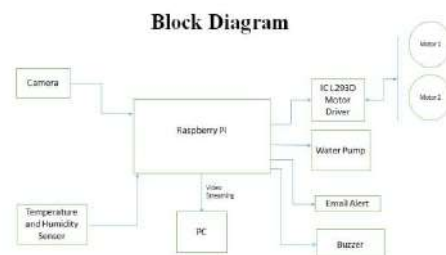
Fig1: Deep learning based Fire Fighting Robot

Sensing the presence of fire is the crucial part of the proposed system. To achieve this the concept of Computer Vision is used. Computer Vision is implementation of Deep Learning (DL). Computer Vision can be described as a subset of Image Processing.

III. DEEP LEARNING:

Deep learning (also known as deep structured learning or hierarchical learning) is part of a broader family of machine learning methods based on learning data representations, as opposed to task-specific algorithms. Learning can be supervised, semi-supervised or unsupervised.

Deep Learning is implemented through Haar Cascade in the proposed work. Haar Cascade is a deep learning object detection algorithm used to identify objects in an image or video and based on the concept of features proposed by Paul Viola and Michael Jones in their paper "Rapid Object Detection using a Boosted Cascade of Simple Features" [ ]. It is an approach where a cascade function is trained with a lot of positive images and negative images. It consists of four parts.

a) Haar Feature Selection

b) Creating Integral Images

c) Adaboost Training

PERFORMANCE ANALYSIS OF DATABASE OPERATIONS ON LARGE MEDICAL IMAGE DATASETS

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ABSTRACT

Improving image storage and retrieval is one of the challenging tasks in most popular research areas like Medical Image analysis and Satellite image processing. There are two methods to store images. One is storing images inside the database as BLOB(Binary Large Object) data types and the second one is outside the database i.e. externally in the file system as Binary files(B files) with references in the database tables. Most of the database systems like Oracle, Microsoft SQL Server, IBM-DB2, MySql etc. support these data types. In our work, we stored bulk image data by using Blob and B-file data types and calculated the execution times for insert, retrieve, backup and recovery operations. Initially we experimented on Oracle 18c and then we repeated same experiments on Microsoft SQL server 2017 to ensure that our experimental results are independent of type of database software that is being used. Experimental results from both the database systems concludes that storing images externally in file systems by using image reference inside the database is 1.5 times faster than storing images internally inside the database using BLOB data type. But performing backup and recovery is 1.5 times slower than Blob data . Since backup and recovery operation are very less likely to happen when compared to DML operations, we finally infer that it is always better to use B-file or File table data types rather than Blob for huge image storage in databases.

Keywords:- *Blob objects, Binary image files, Medical image analysis, satellite image analysis, backup, recovery operations*

[I]. INTRODUCTION

Many user applications related to medical or satellite image analysis requires huge amount of servers space. Image files may be stored either in the database directly as BLOB(Binary Large Object) objects or as a Binary file in the file system and a reference in the database table[1]. Whether the images are stored either in database or in file system, it does not matter much in terms of memory that is going to be occupied but the insertion, retrieval, backup and restore has impact.

Blob object type of storage is supported by most of the popular database vendors. In this type, image data is directly stored in database column using streams as shown in Figure 1. It is basically a simple 3 tier architecture where the user sends bulk images to database server that stores images directly in the database table columns as BLOB data type.

Chapter

Voiceprint-Based Biometric Template Identifcations

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Privacy Preserving in LBS resilient to Location Injection Attacks

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Abstract: Location-based services have become indispensable in people's life with expeditious development of technology. Location-based services(LBS) refers to the services provided by the LBS servers with regards to area and point of interest. Alternatively, the LBS means getting the right information at the right place in time. Protecting user location privacy is the most challenging factor in LBS. This survey aims to present various mechanisms in preserving the user's location privacy and proposes a mechanism for preserving the privacy of user location and query against the location injection attacks. We will be discussing credibility based k-anonymity mechanism for preserving the location of the user and homomorphic encryption for preserving the query of the user resilient location injection attacks in this paper.

I. INTRODUCTION

With expeditious development of technology, users can get services on their fingertips. Among those services, location-based service is one which is extensively used. Location-based services provide additional value to a user of the device by integrating the device position or location with other information.

LBS use the geographic location of devices like smartphones, personal digital assistant (PDA), or navigation device to provide a series of services. Examples of LBS include finding restaurants, theaters, shopping malls, etc near your location. With the help of these LBS apps, users can send the queries which include locations, identities, point of interests, and other information to the LBS server. In return, users take the pleasure of the benefits provided by LBS such as searching for the Points of Interests (POI).

In most of the privacy preservation work, the probability of LBS Server becoming adversary is high, as it may sell user's the private data to the third party legitimately for maximizing its profits or it may act as an adversary to do business with privacy-based services. The remaining of the paper is organized as follows, general system model for preserving the privacy in location-based services and key attributes of LBS are presented in section 2. Section 3 discusses different types of attacks which leak the privacy of user and mechanism that protects the privacy of the user in LBS respectively. In Section 4 different Privacy Preserving Approaches in Location-based Services are discussed.

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In section 5 important Privacy Metrics of LBS are discussed. Section 6 discusses one of the important attacks of LBS i.e Location Injection attack which is discussed followed by preserving the privacy of the user and query content.

II. LBS SYSTEM MODEL

The conventional system model for preserving the privacy in location-based services is composed of three key entities – Users, Anonymizer and LBS server as shown in fig1

Users: The users send LBS query through their mobile device, the query is the point of interest POIi in the nearby area, like requesting for restaurants, shopping malls, clinics, theaters in nearby locations of the user.

Anonymizer: Anonymizer is a third party server. Anonymizer entity is optional. Generally, the anonymizer receives the query from the user. The query is sent to the LBS server by anonymizing the user identity.

LBS server: It serves the user request or provides the information. The server receives LBS query either from users or anonymizer.
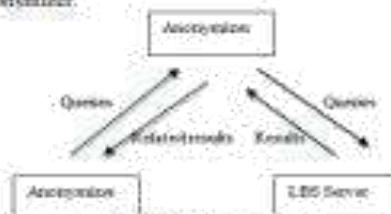
Fig 1:LBS System Model

Figure axis labels are often a source of confusion. Use words rather than symbols. As an example, write the quantity "Magnetization," or "Magnetization M," not just "M." Put units in parentheses. Do not label axes only with units. As in Fig. 1, for example, write "Magnetization (A/m)" or "Magnetization (A m⁻¹)," not just "A/m." Do not label axes with a ratio of quantities and units. For example, write "Temperature (K)," not "Temperature/K." Multipliers can be especially confusing. Write 1 key **attributes in LBS privacy**

When a user requests for the LBS, user identity, location or spatial information, temporal information and query contents are sent to the LBS server.

2.1.1 User Identity: It can be a user name or combination of properties which uniquely identify the user. User identity is the sensitive information, and if the attacker gets access to the identity of the user, the adversary may deceive the user for personal, financial benefits.

Event Extraction And Classification From English Articles

Vanitha Guda, Y. RamaDevi

Abstract: Today's digital world huge number of information sources like wikis, web, blogs and other sources are creating a lot of information with several events. Basically, an event can be a situation, action or state that can be represented in natural language text in the form of happening or occurrence. Analyzing the event information finding the relation between the events is one of the crucial tasks in information retrieval. In a formal way, the event can be defined as a real-world entity that happens or occur; those are the dynamic occurrences which have causes or effects (E.g. earthquake, floods, crime, etc.). Extracting events, event fall within a timeline extraction can be applied in many of the natural language applications like text summarization, temporal question answering systems, etc. Event extraction and classification can use in other related text searches like News domains, legal documents, wikis, manuscripts, and time-based searches. In this paper, we present a methodology for event extraction in natural language text which helps in finding out the type of an event and classifies the events under specific categories. Our work aims to develop a system which would automatically identify events from articles generated over the internet. The system would not only detect the events but also tried to detect important times of the event. Finally compared the accuracy of work with several classifiers and obtained results shows good accuracy measure for Support Vectors machine (SVM).

Index Terms: Natural language Processing, Events Extraction, Events, Time, and Classifiers.

I. INTRODUCTION

Nowadays in this digital era communication has become very fast and easy with that proportionally the amount of data is increasing. There are 2.5 quintillion bytes of data created each day at our current pace, but that pace is only accelerating with the growth of IOT (Internet of Things). Over the last two years alone 90 percent of the data in the world was generated, most of the content is in the form of text. According to the worldwide web (WWW) survey from 2013, the number of Tweets generated for each minute has increased 58% to more than 455,000 Tweets per minute in the year 2018. Instagram users upload 46,740 million posts every minute. From the time 2013, the count of Facebook Posts shared each minute has increased by 22%, from 2.5 Million to 3 million posts per minute in 2016. Every year

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this number has been increased more than 300 percent, from around 600,000 posts per minute in 2011. According to worldometers almost 3 to 4 million articles or posts written every day and there is a serious necessity to analyze the data.

An event that happens at any part of the world gets communicated in a few seconds or minutes to the rest of the world. For example, the recent bomb blast in Syria was known to the world within a few minutes through media. There is a great need to automatically identify various events like bomb blasts, floods, cyclone, fires, political any kind of events, etc., reported in various newswires, Social Media text. The task is to identify various events and their span such as sports events, terrorist events, natural disasters, crime events, corporate events, political events, accidents, etc, in a given text. Further going ahead in this task, along with the identification of event and times which are related to an event identification and classification of the event for further retrieval is the vital task. The actual real-time applications will be benefited only if the full information related to the event is identified. In this Paper, we present a methodology for the event extraction and classification of the event with the category, Event-Time (E-T) Relations from the given natural language text articles. In section-II brief literature about the related works, section-III describes the workflow and implementation detail. Section-IV presents Datasets and Results, observations and finally Section-V concludes the paper.

II. THE LITERATURE OF RELATED WORKS

A. Review Stage

Most of the related works presented in two categories one is domain dependent and other is domain independent of events extraction [1] where domain independent categorizes the events based on lexical features. Instead of analyzing the data most of the researchers focused for the data which changes over the time. Focusing on the hidden patterns of information within period or certain time slot for the better way of analysis. One major note is most of the recent works in this context concentrate on Event detection in English text, very few of them involves the Chinese- language also. With the reference of Borije[2] change mining is new way of generation in data mining which means changes for data and it is necessary to detect the changes in the procedures. To consider the Change Mining method it includes specification, change in time and detection mechanism and change modeling.

An intelligent AAA++ approach to predict high blood pressure using PARP classifier

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ABSTRACT

Objective: High Blood Pressure (HBP) is a major health challenge of many around the world. Existing research covers extensively how to treat HBP, but predicting HBP in advance based on biological and psychological parameters of a person is not covered in the literature. The objective of this paper is to predict HBP based on Bio-Psychological factors of a person.

Methods: We proposed an intelligent Rule-based classifier to predict HBP. The proposed model can be used to prevent HBP rather than using medication. In our approach, we considered AAA++ (Age, Anger level, Anxiety level, Obesity level (+), Cholesterol level (+)) of a person for experimental study. The proposed approach uses priority-based apriori rule pruning (PARP) classifier, which works in 3 stages. Stage 1: generate association rules using apriori. Stage 2: it uses the priority of an attribute to prune the association rules generated in stage 1. Step 3: Rules extracted in stage 2 are used to build a rule-based classifier to predict the class label of test instances. The Results of the proposed model are compared with JRip, PART, OneR and, ZeroR.

Results: Experimentation is done on real-time data set using 10 fold cross-validations. In each fold, 90% data is used to train the model and 10% is used to test the model. The proposed approach has shown improved accuracy (86.4%) and reduced mean length of a rule (1.7) compared to existing rule-based algorithms. Although JRip is good at accuracy (86.9%), but the proposed model has outperformed at the mean length of the rule (1.7).

Conclusion: The extracted rules after experimentation are understandable and informative to the technical and nontechnical community to predict HBP.

1. Introduction

The human body is made of trillions of cells, these cells needs oxygen, and energy for their livelihood. So the heart pumps the blood in order to provide oxygen and energy for all the tissues of the human body. While it pumps the blood, it creates some pressure inside the blood vessels; this pressure is called blood pressure. Blood pressure (BP) is normally represented as 120 over 80 or 120/80 mmHg or systolic blood pressure (SBP) over diastolic blood pressure (DBP). If SBP is greater than 140 mmHg or DBP is greater than 90 mmHg or both on repeated measurements, then the person is diagnosed as a victim of high blood pressure[1,2] or also called Hypertension. Nowadays HBP is one of the root causes of a brain stroke, heart attack, and kidney failure. BP of a person may be raised because of various reasons such as obesity, an unhealthy diet, excess bad cholesterol, excess sodium intake, smoking, consumption of alcohol, age, anger, anxiety, lack of physical exercise etc.[3] In this paper, we kept our eagle eye on the, impact of age, anger level, anxiety level, obesity level and cholesterol levels in raising the blood pressure.

Classification rule mining is one of the emerging concepts in data mining. The main aim of classification rule mining is to find the minimum set of rules in the form IF-THEN, based on training records.[1,2] Many studies suggested that, rule-based classification is highly expressive and also generates easily understandable, interpretable rules.[3] The main aim of the rule-based classification is to find a smaller set of overall rules using training records. If the number of attributes in training data set is large, all possible rules also large, this becomes computationally expensive.[4] But our proposed approach, we used modified apriori Algorithm to generate association rules, where many rules are pruned based on priority of the attribute appear in the antecedent part of the rule. Positive class rules are generated using attributes with high priority, and negative class rules are generated using attributes with low priority. The priority of each attribute is calculated using Pearson correlation coefficient value, as we considered priority,

Vertical Handover Decision Algorithm Based On Several Specifications in Heterogeneous Wireless Networks

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Abstract: Vertical handoff takes place when a mobile movable button from one network to one more (e.g., from WLAN to CDMA 1xRTT). The purpose of this paper is to establish the problem under which vertical handoff need to be done. The trouble is developed as a Markov choice procedure. A web link benefit feature and also a signaling price feature are presented to record the tradeoff in between the network sources made use of by the link and also the signaling as well as handling cost sustained on the network. Commonly, a mobile phone might be transferred to attain the procedures of vertical handover, thinking about just one standard, that is, the received signal strength (RSS). Making use of a solitary requirement might trigger solution disruption, an out of balance network lots, and also an ineffective vertical handover. In this paper, we recommend boosted vertical handover decision algorithm based upon several standards in the heterogeneous wireless network. As well as additionally in this paper, we research regarding 5th generation system.

Index Terms : 4G Networks, 5G Networks, Wireless Networks.

I. INTRODUCTION

In contemporary Future generation wireless systems, many difficult locations is the continual solution for the mobile relocating a location where there is overlapping of networks. The primary purpose of any type of future generation mobile network is a finest connection to every individual any time as well as anywhere [1] In the last number of years, great deals of research study task has really been focused on this challenging issue of adaptability management treatment in heterogeneous cordless systems. When the mobile consumer stays in continuous task, there is a need for handoff to be accomplished from one network to the different one more network, preserving visible, the need of the person in future. Handoff device takes care of the principle of transforming over the networks connected with the present link when a phone call remains in progression. Vertical handoff (VHO) is most plainly made use of the method to sustain proceeding phone call in between various networks having various air user interface strategies throughout internetwork activities. "Handover" is a procedure of rerouting the solutions of a mobile in a network to a brand-new network.

Handoff device aids in choosing the very best appropriate network to which the customer needs to be attached after the implementation of handoff The primary constrict in handoff is minimal handling hold-up. Research study job is focused on creating as well as carrying out lots of brand-new formulas with the primary purpose of giving the needed quality of service (QoS) over a large range of applications [2] The heterogeneous networks are made use of by numerous individuals on the basis of choice provided to different QoS criterion such as live interactive web traffic, much less hold-up, reduced jitter, high accessibility, high bandwidth (BW), Reduced little bit mistake price (BER). Vertical handoff is needed for far better efficiency as well as high schedule factors. The primary criterion like the ability of the network, the price of the network, handoff latency, problems dominating in the network, individual choice as well as usage of power is to be taken into consideration throughout vertical handoff.

The system of handoff has 4 various stages specifically initiation of handoff, handoff choice production, the option of the network, and also the implementation of handoff procedure. Handoff determined by some quality of service (QoS) criterion like stamina of the signal as well as high quality of the network web link and so on is referred to as initiation of handoff. In handoff choice production, the signal roughness and also the QoS specifications of the bordering networks are gauged as well as a choice is required to pick the most effective network appropriate for doing the handoff. Handoff unit is actually recognized straight into straight handoff as well as additionally vertical handoff (VHO). The diagrammatic representation is actually surrendered Amount.2. Parallel handoff is actually a tactic where the handoff is actually executed in between 2 systems possessing a similar type. As an instance, handoff in between Wi-Fi to Wi-Fi relationship is actually thought about as straight handoff. vertical handoff is actually the handoff in between systems possessing several modern-day innovations in addition to numerous design. As an example, Wi-Fi to Wi-Max link is actually taken into account as an vertical handoff. It is just one of the absolute most obviously made use of handoff devices. This newspaper points out on show business of handoff selection producing where the focus has actually applied the selection of selecting the best system one of all the provided systems. TOPSIS formula located upon the concept of several multiple attribute decision making(MADM) is actually gotten used to select one of the most reliable systems as well as additionally remote

112. Flexible Vertical Handover Decision Algorithm based on several specifcations in heterogeneous wireless networks

FLEXIBLE VERTICAL HANDOVER DECISION ALGORITHM FOR HETEROGENOUS WIRELESS NETWORKS IN 4G

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Abstract

Everyone around the globe would like to be linked flawlessly anytime, anywhere through the best network. The 4G network must have the capability to offer high information move rates, a premium of services and also smooth movement. In 4G, there is a sizable range of heterogeneous networks. The users for a variety of treatments would like to use different networks on the manner of their desires like a living, higher schedule and higher transmission capacity. When relationships need to shift in between various systems for performance as well as more top accessibility causes, the seamless vertical handoff is essential. To provide a systematic comparison, lately released VHD formulas have been categorized right into four significant classes depending upon the vital handover decision standard made use of, i.e. RSS located protocols, bandwidth located methods, cost feature-based algorithms, as well as the combination algorithms.

Keywords : 4G network, heterogeneous networks, handover decision, combination algorithms

I.   Introduction

The term 4G is used extensively to consist of many forms of broadband cordless get access to communication systems, not only cellphone systems. Some of the terms made use of to explain 4G is actually MAGIC – Mobile interactives media, anytime anywhere, Worldwide mobility support, included cordless remedy, as well as tailored personal solution. As a promise for the future, 4G units, that is actually, cellular broadband wireless gain access to devices, have actually been actually attracting much rate of interest in the mobile communication field. The 4G bodies not just will assist the next generation of mobile phone service, however additionally will assist the taken care of wireless networks. This paper offers an overall vision of the 4G features, structure, and also assimilation of mobile phone communication.

113.Resource management in fog networking of cloud computing using knn algorithm

Resource Management in Fog Networking of Cloud Computing using KNN Algorithm

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Abstract: It is necessary to deploy any application in Cloud environment to reduce the investment cost, maintenance cost and licence of hardware/software. Keeping these benefits, it is advised to go for cloud computing environment for any application deployment. The major challenge in this environment is fault tolerance of resources to support for continuous availability of resources to client for working. Especially in IoT applications, we use Fog networking connecting to cloud computing. In this scenario, it is advised to use KNN (K- Nearest Neighbour) resource identification and allocation algorithm to increase the throughput to user requirement. We are presenting an approach to allocate the required resources with optimal distance resource allocation, so as to improve the throughput of user requirement.

Keywords: Cloud Computing, KNN, Fog Networking, Resource management, Fault Tolerance.

*****

1. Introduction

A. Cloud Computing : Cloud computing is the is the present scenario of business and network market which provides the computer resources on demand availability, especially data storage and computing power, without direct active management by the user. The term is generally used to describe the making available and provide resources on request to satisfy the user demands through data centers through the Internet[4]. Large clouds, predominant today, often have functions distributed over multiple locations from central servers.
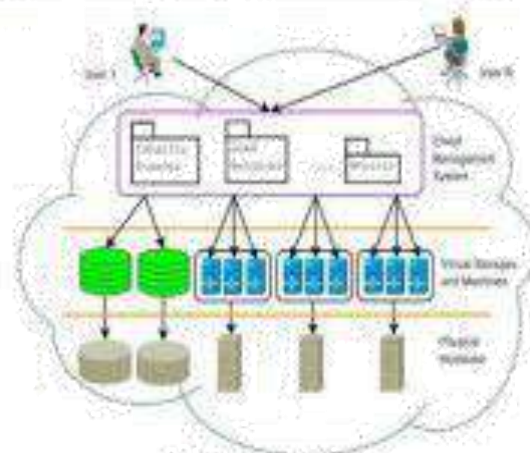
Fig 1: Cloud Architecture

Features of Cloud Computing

- Resources Pooling.
- On-Demand Self-Service. It is one of the important and valuable features of Cloud Computing as the user

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Sign Language Recognition

E.Padmalatha, S.Sailekya, R.Ravinder Reddy, Ch.Anil Krishna ,K.Divyarsha

Abstract: There are nearly 15 million people around the world who have difficulty in speaking or communicating. Their only way of communication is through sign language. Hand gesture is one of the methods used in sign language for non-verbal communication. It is most commonly used by deaf & dumb people who have hearing or speech problems to communicate among themselves or with normal people. There are many recognized sign language standards that have been defined such as ASL(American Sign Language), IPSL(Indo Pakistan Sign Language), etc., which define what sign means what. ASL is the most widely used sign language by the deaf and dumb community. The deaf and dumb use sign language to communicate among themselves with the knowledge of the standard sign language. But they can't communicate with the rest of the world as most of the people are unaware of the existence and the usage of the sign language. This method aims to remove this communication barrier between the disabled and the rest of the world by recognizing and translating the hand gestures and convert it into speech.

Key words: sign language, disabled, non-verbal communication

I. INTRODUCTION

The hearing disabled and mute individuals can't blend with the social world as a result of their disabilities. Involuntarily they are treated differently by the society. They cannot perform well in many areas of interactions. For example, education environment for person with disabilities is not similar as the rest of the people, disabled people do not have any special tools to buy commodities, they have hard time to find work, and much more. It creates a gap between person with and without the disabilities. This gap is ever increasing day by day. There are more than 10 million deaf adults and deaf children in the world using American Sign Language (ASL) as a way of communication. In spite of such large numbers, very little efforts have been put to bridge the gap.

The sign language is a very important way of communication for deaf-dumb people. In sign language each gesture has a specific meaning. So therefore complex meanings can be explain by the help of combination of various basic elements. Sign language is a gesture based language for communication of deaf and dumb people.

It is basically a non-verbal language which is usually used by deaf and dumb people to communicate more effectively with each other or normal people. Sign language contains special rules and grammars for expressing effectively.

Basically there are two main sign language recognition approaches image-based and sensor based. But lots of research is going on image based approaches only because of advantage of not need to wear complex devices like hand gloves, helmet etc. like in sensor based approach. Gesture recognition is gaining importance in many applications areas such as human interface, communication, multimedia and security. Typically Sign recognition is related to image understanding. It contains two phases: sign detection and sign recognition. Sign recognition is recognizing a certain shape that differentiate the object from the remaining shapes. Especially in the cases when no alternative communication is available. The technical point of view characteristic features of sign language communication are : its social direction and meaning, technical and technological convenience and easy to use. The system will use a webcam for the capturing images and pre-processing of the signs will be done by using OpenCv library. On having the input sequence of images captured through web-cam here the model uses some image preprocessing steps for removal of background noise and employs slope distance based algorithm i.e. Fingertip Detection by which generates a ratio with a help of which a template of the captured image is generated.

II. METHODOLOGY

The main objective of the proposed system is eliminating the communication barrier and eases the process of communication between able and disabled people. Along with recognizing the gesture, we also give a speech output of the interpretation. There are nearly 15 million people around the world who have difficulty in speaking or communicating. Their only way of communication is through sign language. Hand gesture is one of the methods used in sign language for non-verbal communication. It is most commonly used by deaf & dumb people who have hearing or speech problems to communicate among themselves or with normal people.

The deaf and dumb use sign language to communicate among themselves with the knowledge of the standard sign language. But they can't communicate with the rest of the world as most of the people are unaware of the existence and the usage of the sign language. Our project aims to recognize and translate the hand gestures and convert it into speech. Having observed the number of deaf and dumb people[1] who have difficulty in communicating and the existing systems that don't provide a complete end to end system to eliminate the issue, we decided to develop this solution.

Event Extraction And Classification From English Articles

Vanitha Guda, Y.RamaDevi

Abstract: Today's digital world huge number of information sources like wikis, web, blogs and other sources are creating a lot of information with several events. Basically, an event can be a situation, action or state that can be represented in natural language text in the form of happening or occurrence. Analyzing the event information finding the relation between the events is one of the crucial tasks in information retrieval. In a formal way, the event can be defined as a real-world entity that happens or occur; these are the dynamic occurrences which have causes or effects (E.g. earthquake, floods, crime, etc.). Extracting events, events fall within a timelines extraction can be applied in many of the natural language applications like text summarization, temporal question answering systems, etc. Event extraction and classification can use in other related text searches like News domains, legal documents, wikis, manuscripts, and time-based searches. In this paper, we present a methodology for event extraction in natural language text which helps in finding out the type of an event and classifies the events under specific categories. Our work aims to develop a system which would automatically identify events from articles generated over the internet. The system would not only detect the events but also tried to detect important times of the event. Finally compared the accuracy of work with several classifiers and obtained results shows good accuracy measure for Support Vectors machine (SVM).

Index Terms: Natural language Processing, Events Extraction, Events, Time, and Classifiers.

I. INTRODUCTION

Nowadays in this digital era communication has become very fast and easy with that proportionally the amount of data is increasing. There are 2.5 quintillion bytes of data created each day at our current pace, but that pace is only accelerating with the growth of IOT (Internet of Things). Over the last two years alone 90 percent of the data in the world was generated, most of the content is in the form of text. According to the worldwide web (WWW) survey from 2013, the number of Tweets generated for each minute has increased 58% to more than 455,000 Tweets per minute in the year 2018. Instagram users upload 46,740 million posts every minute. From the time 2013, the count of Facebook Posts shared each minute has increased by 22%, from 2.5 Million to 3 million posts per minute in 2016. Every year

this number has been increased more than 300 percent, from around 600,000 posts per minute in 2011. According to worldometers almost 3 to 4 million articles or posts written every day and there is a serious necessity to analyze the data.

An event that happens in any part of the world gets communicated in a few seconds or minutes to the rest of the world. For example, the recent bomb blast in Syria was known to the world within a few minutes through media. There is a great need to automatically identify various events like bomb blasts, floods, cyclone, fires, political any kind of events, etc., reported in various newswires, Social Media text. The task is to identify various events and their span such as sports events, terrorist events, natural disasters, crime events, corporate events, political events, accidents, etc, in a given text. Further going ahead in this task, along with the identification of event and times which are related to an event identification and classification of the event for further retrieval is the vital task. The actual real-time applications will be benefited only if the full information related to the event is identified. In this Paper, we present a methodology for the event extraction and classification of the event with the category, Event-Time (E-T) Relations from the given natural language text articles. In section-II brief literature about the related works, section-III describes the workflow and implementation detail, Section-IV presents Datasets and Results, observations and finally Section-V concludes the paper.

II. THE LITERATURE OF RELATED WORKS

A. Review Stage

Most of the related works presented in two categories one is domain dependent and other is domain independent of events extraction [1] where domain independent categorizes the events based on lexical features. Instead of analyzing the data most of the researchers focused for the data which changes over the time. Focusing on the hidden patterns of information within period or certain time slot for the better way of analysis. One major note is most of the recent works in this context concentrate on Event detection in English text, very few of them involves the Chinese- language also. With the reference of Borsje[2] change mining is new way of generation in data mining which means changes for data and it is necessary to detect the changes in the procedures. To consider the Change Mining method it includes specification, change in time and detection mechanism and change modeling.

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High Performance VLSI Architecture for Braun Multiplier

S.Karunakaran, B.Poonguzharselvi

Abstract: The requirement for portable devices with high fidelity should contains less power. Adding two binary numbers is the basic thing in ALU Unit. Adder is an important part of the processor. The complexity of designing the multiplier and ALU changes due to the transistor count. Full adder plays a vital role in signal processing applications, Embedded systems. In the design of fundamental computation units such as multiplier should be included in future application. Designing VLSI multipliers helps in deriving high end performance architecture which minimizes the consumed power consumption in the architecture. Generally, parallel multipliers are adopted for area optimization and processing speed. 28 T and 20 T full adders are designed which is further utilized for the implementation of Braun multiplier in virtuo schematic of Cadence software 180nm transistor size design.

Index Terms: Braun multiplier, 5 bit adder, low power

I. INTRODUCTION

In design of future systems low power components are needed. In multipliers and adders, the necessary parameter to be considered is the power consumption or dissipation. In the development of high performance and speed, the design of low power multipliers are essential. Adders plays a crucial role in the synthesis of multipliers. Both multipliers and signal processing units plays an important role in VLSI systems. For generation of partial products Braun multiplier consist of n-1 carry save adders and a ripple carry adder. Binary digits are added by means of adder which has the capability to save the carry. By adopting the carry save adders and ripple carry adders, products are added parallely, it is essential for speed multipliers.

II. LITERATURE SURVEY

Improvement in power, delay, area has been done in the implementation of Full adder cells by reducing the transistor count. Description about the 28 T and 20 T is given by comparing the simulation results of full adder cells in 180nm technology.

The basic logical equations of full adder Carry(1) and Sum(2) are using to implement the carry save and ripple carry adders.

$$Carry = A.B + B.Cin + A.Cin \quad (1)$$

$$Sum = A.B.Cin + Carry (A+B+Cin) \quad (2)$$

A. Full Adder Using 28 number of transistors:

The circuit and waveform of adder using 28 numbers of transistors is shown in diagram 1 & diagram 2 respectively. It includes 2 inverters, 14 NMOS and 14

PMOS transistors. The NMOS width: PMOS width which is beta ratio is 1:3. According to the ratio, the NMOS width is one-third of the PMOS width.

Fig 1: Circuit of Full adder utilizing 28 number of transistors
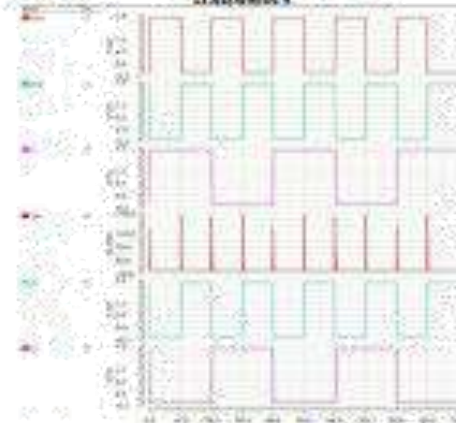
Diagram 2: Output of Adder using 28 number of transistors

B.Adder Using 20 Number of transistor:

The functionality of Full adder is performed with 20 transistors. It consists of 10 number of transistors of PMOS and NMOS respectively. For this architecture, transmission gates are also utilised. Circuit 3 and Fig 4 shows the circuit and waveforms of Full adder

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EXTRACTING HEAD COMPONENT FROM WEB NEWS PAGES

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ABSTRACT

With the increased use of the Internet, there are huge data available on world wide web. Every Web document consists of useful information. There are many types of web documents. One of the type is a web news page or web news Document. There are a number of approaches exist to extract web content from web document. Existed approaches use an HTML source page of the web document, uses Document Object Model-DOM etc. Among These approaches some are automatic and some are semi-automatic. Many methods available Extracting web content from web news pages. One of the popular method uses Text Tag Ratio. This method extracts content successfully, but leaves noise. This paper mainly focuses to extract the Head components from web news pages. This approach uses existing Text Tag Ratio used in CETR and adds the novel approach to eliminate noise so as to extract only Head Components. As our Proposed system is able to extract 80%-85% user relevant information.

Index Terms: Web data extraction, Web mining, Web content extraction, Tag-Ratio, HTML, Document Object Model, tag-ratios, tag density.

I. INTRODUCTION

From the inception of the Usage of Internet, WWW has experienced remarkable growth. The content of the www is accessed via Web Browser. Huge information on number of domains is available on the internet. The Internet development brought prosperity in many fields such as information retrieval, knowledge communication, etc, and information become overload. To extract the relevant and useful information their different methods developed using information retrieval and data mining. Recent web document containing different kinds of information. Every we page in website contains the information required and besides document also contains noisy contents such as headers advertisements, footers, copyright information decorations, etc. The noisy contents may affect the performance of the user searching for the information. To avoid this noisy content and extracting main contents from web document has become the important process for the users required useful information. The approach is developed to extract the main content from web documents during crawling is required. This approach needs to separate the web document from noisy contents. The content extracted can be used for processing of knowledge and classification of knowledge, further provides data and information source for stakeholders or other enterprises. Traditional extraction of information methods can be categorized mainly, semi-structured,text extraction and structured web information extraction. There are numerous approaches existing on web content extraction. Different approaches have been proposed for web information extraction algorithm and can be divided into three categories namely HTML source page based, Vision-Based, Document object model DOM-based and density based approaches. Recent research shown best results using the HTML based information extraction when it is applied on web news pages. Text Tag Ratio is used in finding the content. To remove the noise in the extracted content are

ECETR-Extended Content Extraction via Tag Ratios

R Ashok Kumar, Y Rama Devi

Abstract: The regular approach for the Common Internet user to search the Contents of World Wide Web is through web query interfaces. Enormous use of the Internet to for the desired information around the world, the collection of important information from multiple web pages remains a difficult problem. There are multiple web content extraction systems are proposed to extract desired information from webpages. There are many number of manually constructed, supervised, semi supervised systems are developed in the field of web information extraction. There are many ways to extract the content from web pages are developed, such as document Object trees (DOM), Text Density, Tag Ratio proportion, visual information based algorithms. This paper proposes a novel web content extraction method on web content extraction uses Tag Ratios and added clustering methods. As our Proposed system is able to extract 85%-90% user relevant information.

Index Terms: Web mining, Web data extraction, Web content extraction, Tag-Ratio, HTML, Document Object Model, tag ratios, web content extraction.

I. INTRODUCTION

The Internet the main growing source of information for the modern era. With the increased billions of internet users and innumerable web sites, the data available to an individual is valuable. Large amounts of Data available that may be important to different entities are provided in news articles on the Internet. Now a day's web news pages are repeatedly updated to get consistent data. From web news pages we get more valuable information, updated information, easy to extract from the software agent, or web programming using web apps. To analyse news articles from a paper source, the articles would first have to be read into a computer, making the process of extracting the information within much more cumbersome and time consuming. Thus, automating the extraction of the primary article is necessary to allow further data analysis on any information within a web page. To help analyse the content of web pages, researchers developed ways to extract the information required from a web page. The modern web page today consists of many different links, ads, and navigation data. This additional information may not be relevant to the main content of the website, and may be ignored in many cases. This additional information, such as ads, can also result in misleading or incorrect information. Therefore, determining the relevant main content of a Web page between additional information is a difficult problem. There have been several approaches existing to filter the main content of a webpage. Carey in CETR uses first time Tag Ratios in Web content extraction. This paper proposes ECETR an extended content extraction via Tag Ratios, which is a new method used to determine the content of the main text within an article on a Web site results most relevant information as possible. ECETR relies on the use of HTML tags in HTML. ECETR uses the Tag Ratios to extract the content. ECETR concentrates the density of the content and extracts the relevant content by eliminating the irrelevant content. ECETR uses the datamining clustering methods to combine relevant to information for meaningful content. This paper is structured as follows: Section II states the relevant work in this area. Details of section III explains the ECETR design methodology. Section IV discusses the evaluation measures used to test the method. Section V describes the experimental results for ECETR.

II. RELATED WORK

Different algorithms have been proposed earlier for web content extraction. Weninger et al. [3] developed Content extraction via Tag Ratios(CETR) extracted contents from diverse web pages using the tag ratio measure on HTML documents. Christian Kohlschütter et al. [6] presented Boiler Plate Detection Using Shallow Text Features Extracted the content and classified the content into long text and short text. Carey et al. [2] presented in HTML web content using Paragraph Tags Used a Paragraph Extractor to extract main content in Web News Page. Wei Liu et al [7] developed A Vision Based Approach for Deep Web Data Extraction used Vision based approach to extract web content with web programming language independent approach. Deng Cai et al. [8]in Vision Based Page Segmentation algorithm used visual information of the web page to extract web content. First attempts to extract content were often some kind of human interaction required to identify important features of the Web site, while these methods could be accurate, and were not easily expandable to collect collective data. The other previous methods used several natural language processing methods to help define relationships between web page regions, or use HTML tags to identify multiple areas within text. Kushmerick et al. has developed a way to identify ads on the page and to remove them. Many methods try to use the Document Object Model (DOM) to extract formatted HTML data from Web sites. Much research tends to rely on the work of former researchers. Pinto et al. Extend body text extraction using the document slope curve to

PERFORMANCE ANALYSIS OF DATABASE OPERATIONS ON LARGE MEDICAL IMAGE DATASETS

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ABSTRACT

Improving image storage and retrieval is one of the challenging tasks in most popular research areas like Medical Image analysis and Satellite image processing. There are two methods to store images. One is storing images inside the database as BLOB(Binary Large Object) data types and the second one is outside the database i.e. externally in the file system as Binary files(B files) with references in the database tables. Most of the database systems like Oracle, Microsoft SQL Server, IBM-DB2, MySql etc. support these data types. In our work, we stored bulk image data by using Blob and B-file data types and calculated the execution times for insert, retrieve, backup and recovery operations. Initially we experimented on Oracle 11c and then we repeated same experiments on Microsoft SQL server 2017 to ensure that our experimental results are independent of type of database software that is being used. Experimental results from both the database systems concludes that storing images externally in file systems by using image reference inside the database is 1.3 times faster than storing images internally inside the database using BLOB data type. But performing backup and recovery is 1.5 times slower than Blob data . Since backup and recovery operation are very less likely to happen when compared to DML operations, we finally infer that it is always better to use B-file or File table data types rather than Blob for huge image storage in databases.

Keywords:- Blob objects, Binary image files, Medical image analysis, satellite image analysis, backup, recovery operations

[I]. INTRODUCTION

Many user applications related to medical or satellite image analysis requires huge amount of servers space. Image files may be stored either in the database directly as BLOB(Binary Large Object) objects or as a Binary file in the file system and a reference in the database table[1]. Whether the images are stored either in database or in file system, it does not matter much in terms of memory that is going to be occupied but the insertion, retrieval, backup and restore has impact.

Blob object type of storage is supported by most of the popular database vendors. In this type, image data is directly stored in database column using streams as shown in Figure 1. It is basically a simple 3 tier architecture where the user sends bulk images to database server that stores images directly in the database table columns as BLOB data type.

Recent Trends and Security Challenges in Mobile Ad Hoc Networks

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Abstract: In MANET's, there will certainly be no central authority to handle the network. Nodes need to rely upon various other nodes to maintain the network linked. As the ad-hoc network is vibrant and also every transmission in these networks come to be at risk to numerous variety of attacks as well as safety ends up being a significant problem. MANET has actually become a most appealing location of study. MANET is a self-organized network of mobile nodes with constantly altering geography. MANET has a wide variety of applications like army, rescue procedures throughout all-natural catastrophes, business fields, neighborhood degree network/PAN and so on. Because of the fundamental attribute of being ad-hoc, MANET is extra vulnerable to attacks. In this paper, we will certainly take a short review of the attacks in MANET at various layers, and also feasible protection steps.

Keywords: Security Attacks, Routing Protocols, Security Schemes

I. INTRODUCTION

Directing performance included right into the mobile nodes in MANETs. Peer-to-peer interaction over multi-hop networks will certainly be offered in MANETs via making sure on-hop connection with web link layer protocols as well as prolonging connection to numerous jumps via network layer directing as well as information forwarding protocols. As the interaction lugged out over cordless web links, emulate results of radio interaction, such as sound, fading and also a disturbance. On top of that, the web links have much less transmission capacity than the wired network. For this reason, safety and security concerns in MANETs depend on implied depend on a partnership to course packages amongst taking part nodes.

Mobile Ad-hoc Networks are framework for which fewer networks with dispersed procedures [2] every node in MANET is totally free to go into or leave the network. In MANET all terminals are self-governing and also usage multi-jump directing. In MANET mainly the nodes have reduced battery as well as little memory. As there is no main authority or accessibility factor in MANET, transmitting is a really essential problem. We have 3 techniques for transmitting in MANET and also a large range of transmitting protocols [1] every protocol has its very own benefits and also restrictions. We can note a couple of weak points of MANET as-- Restricted data transfer, reduced battery power, computational power, safety and security and so on. A study is taking place to conquer all such problems. Out of these, we are concentrating a lot more on protection attacks in this paper.

II. MANET SECURITY ATTACKS

In MANET every mobile node functions as a router whose job is to find and also preserve the courses within the network for information transmission. It is the duty of a node to discover the quickest course in between 2 nodes. That is why routing is extremely critical as well as routing attacks [4] is the passion location of researchers.

A Research on Interoperability Issues in Internet of Things at Application Layer

V. Tirupathi, K. Sagar

ABSTRACT—Now a days everyone is depending on smart things (smart computing devices) or devices to complete their task comfortably from anywhere. These smart things create a network to exchange information between them by following OSI/ISO (Open system interconnection) or TCP/IP protocol stack. The two protocol stacks have seven layers which are being used by smart things to communicate with each other through network. These seven layers perform different tasks by using different protocols at each level. For example, network layer has TCP and UDP protocols for segmentation, and communication application layer has http, https and SNMP etc... Smart things communicate with each other either through connection or connection less communication mediums. Devices are various kind, some of them are operate on low-power and low-data rates. Some of them operate on high-power and high-data rates using strong Ethernet networks. Establishing communication among heterogeneous devices and software protocols is a challenging task. Smart things behave intelligently with help of internet, embedded sensors and actuators. Smart things have processing and network capabilities. These are the building blocks for Internet of Things (IoT). This paper summarizes all application layer protocols and interoperability issues.

Keywords—OSI/ISO, TCP/IP, UDP, IoT, SNMP

1. INTRODUCTION

Internet of Things (IoT) is "internet connectivity among physical devices and everyday objects". It has introduced by Kevin Ashton of Procter & Gamble in 1999. The things may be radio-frequency identification (RFID) tags, actuators, mobile phones, sensors and other devices which are capable of connecting with internet.

Internet of things (IoT) has expanded tremendously due to constant innovations in hardware, communication networks and software solutions [1, 2]. Huge number of devices are communicating with each other through internet and generating massive collections of data. To store and process huge collections of data cloud servers are being used [3, 4]. For fast processing of data and to get faster response fog computing technologies were introduced. The performance of IoT together with fog and cloud determined using many factors. Application layer protocols plays a vital role among these factors. HTTP and HTTPS protocols are extensively used protocols to make communication with other servers through internet. HTTP appropriate for computing devices with high-power, faster processing unit and strong communication mediums. But IoT devices have slower processing unit and low-power.

Few light weight protocols have created for IoT devices at application layer level. They are AMQP (Advance Message Queuing Protocol) and DDS (Data Distribution Services), CoAP (Constrained Application Protocol), MQTT (Message Queuing Telemetry Transport), XMPP (Extensible Message and Presence Protocol). These protocols support constrained devices for message exchange. In fact a single messaging protocol is not enough to provide all communication services because protocols uses different communication models.

2. COMMUNICATION MODELS

The IoT devices send data to and receive from servers or cloud systems using any one of the application layer protocols like CoAP or MQTT. These protocols either follow request/response or publish/subscribe communication model. Request/response communication widely used in client/server applications. Client sends request to the server, server receives client request process it and sends response to the clients. A server can process any number client requests at the same time. CoAP and HTTP follows request/response communication model. Fig1 shows request/response model.
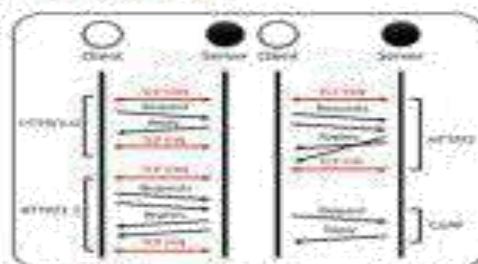
Fig 1: Request-Response model, for example: COAP and HTTP

Publish/subscribe is an alternative to request/response model. It consisting of three entities i.e. publisher, broker and subscriber. Fig 2 describe publish/subscribe model. Subscriber subscribes the required topic within the system. Broker is an important entity who manages incoming and outgoing messages in between publisher and subscriber. Publisher is a information provider [5] who provides services and send to the broker. MQTT, AMQP and DDS follows publish/subscribe communication model.

A Machine Learning Approach To Detect Intruder By Identifying Anomalies in Network Traffic in an Enterprise Networks

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Abstract

Malware is an application that is harmful to our forensic information. Basically, malware analysis is the process of analyzing the behaviors of malicious code and then create signatures to detect and defend against it. Malware, such as Trojan horse, Worms and Spyware severely threatens the forensic security. This research observed that although malware and its variants may vary a lot from content signatures, they share some behaviour features at a higher level which are more precise in revealing the real intent of malware. This paper investigates the various techniques of malware behavior extraction and analysis. In addition, we discuss the implications of malware analysis tools for malware detection based on various techniques. This paper proposes a new and more sophisticated antivirus engine that can not only scan files, but also build knowledge and detect files as potential viruses. This is done by extracting system API calls made by various normal and harmful executable, and using machine learning algorithms to classify and hence, rank files on a scale of security risk. While such a system is processor heavy, it is very effective when used centrally to protect an enterprise network which maybe more prone to such threats.

Keywords: Malware detection, virus, data mining, Information gain, random forest, machine learning, classification, enterprise, network, security.

1. Introduction

Malware, short for malicious software, consists of programming (code, scripts, and other content) designed to disrupt operation or gather information that leads to loss of privacy, gain unauthorized access to system resources, and other abusive behaviour [1]. It is a general term used to define a variety of forms of hostile, intrusive, or annoying software or program code. Any software is classified as malware based on the intent of the maker rather than any particular feature. Malware includes computer viruses, worms, Trojan horses, spyware, dishonest adware, crime-ware, most rootkits, and other malicious and unwanted software or program [2] the major challenges that anti-malware faces today is the vast amounts of data and files which need to be evaluated for potential malicious intent. For example, Microsoft's real-time detection anti-malware products are present on over 160M computers worldwide and inspect over 700M computers monthly. This generates tens of millions of daily data points to be analyzed as potential malware. One of the main reasons for these high volumes of different files is the fact that, in order to evade detection, malware authors introduce polymorphism to the malicious components. This means that malicious files belonging to the same malware "family", with the same forms of malicious behavior, are constantly modified and/or obfuscated using various tactics, such that they look like many different files.

In order to be effective in analyzing and classifying such large amounts of files, we need to be able to group them into groups and identify their respective families. In addition, such grouping criteria may be applied to new files encountered on computers in order to detect them as malicious and of a certain family.

For this challenge, Microsoft is providing the data science community with an unprecedented malware dataset and encouraging open-source progress on effective techniques for grouping variants of malware files into their respective families.

Symantec published a report in 2008 that "the release rate of malicious code and other unwanted programs may be exceeding

A Relative Survey on Handover Techniques in Mobility Management

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Abstract. Innovation is advancing at a speedier pace and necessity for web organizations at whatever point wherever is required. To impact this vision ever to better organizations open to a customer, effective mobility managing procedures must be composed. Two key intends to execute mobility administrations are Handover and area administration. Therefore, we need to have an efficient mobility management system among heterogeneous wireless networks where several wireless networks can interoperate to provide users with good QoS. In this paper, distinctive issues related to mobility administration in the coming period of frameworks are highlighted and besides throws a light on the uncertain zones to ensure proficient mobility management.

Index Terms— Location Management, Mobile Node, Handover, Mobility Management, Mobility Models.

1. Introduction

An enormous number of termini are connected over the Internet worldwide with a mutual aim of being 24 by 7 service. This has incited improvement in all areas, business, enlightening, transportation et cetera. Now a days the network technologies are speedily continuing forward in the advancement pathway, various access administration systems have been proposed to address the issues of predictable accessibility. The organization of mentioned frameworks is the prime point of view as proposed frameworks requires more resource allocation [1]. The Figure 1: Mobility administration in various heterogeneous wireless networks shows the varied setup of systems through mobility administration structure [8].

2. Related Work
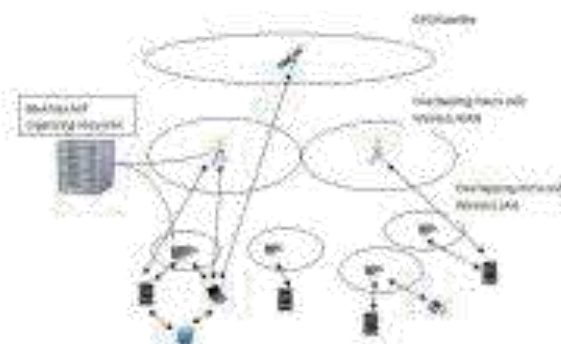
Fig. 1. Mobility in Heterogenous Network

Extended algorithms for mining frequent patterns using Decision tree in R

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Abstract- For mining frequent patterns, the datasets are classified into different classes. Classification is an important problem in data mining. For a database with large number of records, classification decides to which class a particular record belongs. Decision tree is a classification scheme, which is a best and mostly used supervised learning method that generates a tree and a set of rules representing the model of different classes from a given data set. Tree based algorithms endow predictive models with high accuracy, performance and ease of interpretation. The set of records are divided into two disjoint subsets namely training and testing data sets, former is used to identify the classifier and later for accuracy of the classifier. Greedy strategy is followed to grow decision tree by making a series of locally optimum decisions1.

Decision tree is a graphical representation of choices and their results in form of a tree. The nodes in the graph represent an event or choice and the edges of the graph represent the decision rules or conditions. It is mostly used in Machine Learning and Data Mining applications, which is implemented in a data analytical tool R. By developing visualization decision rules for prediction recursive partitioning is achieved which is fundamental tool in data mining to identify frequent patterns.

Keywords: Decision tree, classification, frequent pattern.

I. INTRODUCTION

Decision tree is a type of supervised learning algorithm that can be used in both regression and classification problems. Decision trees work for numerical attributes and categorical attributes. Attributes whose domain is numeric is called as numerical attributes and whose domain is non-numerical is called as categorical attributes. They provide a clear indication of which attributes are important for prediction or classification. There is one distinguishing attribute called the class label. They generate rules that can be understood easily. The decision tree has nodes where each leaf node is assigned a class label and non-terminal nodes including root node represent attributes and test conditions or rules. Decision tree is a model of the dataset and used to predict the class label for new records. It starts at the root node and at each edge a decision is taken whether to follow that edge or not, depending on its state.2

II. CONSTRUCTION OF THE DECISION TREE

Decision tree construction initially starts with a root node that represents all the records in the training data set. Next they recursively partition the records into each node of the tree and for each partition they create a child to represent it.

Algorithm to partition the data3:
Partition (Data Di)

1. If all records belong to only one class then the tree said to be homogeneous and it returns one class Ci.
2. Else the tree is non homogeneous and is split for each Attribute A to evaluate it.
3. Use best split found to partition data 'd' into D1,D2...Dn
4. 4. for each Di: Partition Di.
5. 5. If the tree contains no cases then it is called trivial and has a leaf but the class to which the leaf belongs must be determined from Information other than tree.

Generally, all decision trees examine only one attribute at a time so that the splitting is done based on a single attribute at any given time.

Real Time Analysis of Crowd Behaviour for Automatic and Accurate Surveillance

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Abstract—Surveillance in this modern era is a necessity. Creating an alert in case of emergencies and disturbances is of very much importance. As the number of simultaneous camera feeds increase, burden on human supervisor also increases. The proposed system is a way to aid human supervisor in the surveillance job. Creating alerts in real time will help responding quickly to crucial situations. With this in mind, we propose the following things: (1) Generation of ViF (Violent Flow Descriptors) as high-level features in real time. (2) Using generated ViF's of a Video Dataset for training a neural net and testing its accuracy. (3) Developing a system that can detect the signs of disturbance among the crowd in real time and can learn from the decisions it makes.

Keywords—*Real time surveillance; violent flow descriptors; neural network*

I. INTRODUCTION

Cost of surveillance equipment in this digital era is minimal. In the view of public safety, CCTV cameras are installed in crowded and densely populated areas. The footage from CCTV cameras are continuously monitored by humans in order to respond in case of emergencies. This is a routine and tedious job for a human to continuously pay attention to multiple screens. Surveillance by humans is inefficient as it is limited to human capacity and may not be error free. If computers are replaced by humans to perform surveillance and generate alerts, it may aid the humans to respond quickly to the alerts. If we consider the amount of video footage generated simultaneously, we need a solution which can handle input at this scale.

The research done until now focuses on increasing the accuracy but makes a significant trade off with speed. We here focus on a scalable and efficient algorithm which focuses on both accuracy and generating alerts in real-time.

Generation of ViF [1] is already been experimented previously. So as to generate ViF, there is a detailed process that has to be followed. Starting with the videos, they have standard aspect ratio of 3:4 and are of very low quality. As the crowd behavior is completely random, detecting breakouts in the crowd becomes a real challenge. Also the content of the video is considered to be originated from a CCTV camera hence any other source of information such as subtitles and audio cannot be used. Continuous surveillance system is of much importance and very less attention is given to it.

In this proposed system, we try to implement an algorithm which accurately detects violence in real-time. Through this algorithm we try to obtain safer surroundings and have a quick response time to violent incidents.

II. PREVIOUS WORK

A. Optical Flow

Optical Flow is the core part of Violence Detection. Optical Flow is the relative motion between two image frames which are taken at times t and t+Δt at every pixel position. Methods for determination of Optical Flow can be listed as Phase correlation [8], Block-based method [9], Differential methods and Discrete Optimization methods. The most commonly used methods are Lucas Kanade and Horn-schunck optical flow methods [6], which come under Differential methods based on solving first order derivative. We used C Liu's [2] optical flow algorithm for our task which will be used to further obtain Flow Vector Magnitude. Suppose V_x and V_y are the velocities of a pixel along x and y axis obtained through optical flow algorithm, then the flow vector magnitude can be obtained as, $m_t = \sqrt{V_{x,t}^2 + V_{y,t}^2}$. C Liu's Optical flow algorithm was originally written in C language and mex files were written for compatibility with MATLAB. We used bob package [3] for using that particular algorithm in Python.

B. Violent Flow Descriptors

ViF (Violent Flow Descriptors) [1] have been used previously to obtain global level features of a video. After obtaining the flow vector magnitude (m), we calculate the binary vector. This binary vector is calculated for each pixel which reflects the change in magnitude.

$$b_{x,y,t} = \begin{cases} 1, & if \ |m_{x,y,t+1} - m_{x,y,t}| \geq \theta \\ 0, & otherwise \end{cases} \quad (1)$$

After obtaining the binary vector for each frame, we add binary vectors which are obtained for all the frames and normalize the value with the number of frames taken under consideration.

$$\bar{b}_{x,y} = \frac{1}{T} \sum_t b_{x,y,t} \quad (2)$$

This $\bar{b}$ generated is divided into M*N non-overlapping cells and collecting magnitude changes of each cell separately. These magnitude changes are then represented by a fixed size histogram. These M*N histograms are further concatenated to obtain a single descriptor vector which is known as the ViF.

DETECTING FRAUD IN CYBER BANKING USING FEATURE SELECTION AND GENETIC ALGORITHM

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Abstract : In the last decade,due to extensive development of information technology and communication infrastructure,there has been a rapid advancement in financial and banking system and Services. Banks and other financial institutions have invested in the field of modern technologies to provide more updated and efficient products and services. Thus, the variety of relevant products and services and also the number and value of transactions have increased. As online transactions became more and more popular, the frauds associated with them have also grown affecting the industry largely. Financial fraud has been a big concern for many organizations across industries, as billions of dollars are lost yearly because of this fraud. Securing transactions, detection of new ways of fraud and abuse in financial documents, the discovery of finished and unfinished frauds, detection and discovery of processes and operations of money laundering and etc. are among the most challenging issues in this area. The existing algorithms used do not give results considering different aspects of a transaction being carried out. However, there are a few researches which quote many features, but they are not practically implemented. Here a solution to the field of fraud detection in cyber banking is provided using feature selection and genetic algorithm. The bank data is given in an excel sheet and feature selection is applied to the data. To increase the accuracy of detected fraud, genetic algorithm is applied to the output of feature selection.

Index Terms - cyber banking, feature selection, genetic algorithm, fraud detection.

I. INTRODUCTION

With the increase in the development of people's access to the internet, the use of online transactions in daily trades have increased. One of the most important problem of e-commerce is internet payment systems and fraud in e-payments. Financial fraud can, not only cause financial damages to the relevant organization but also causes the loss of credit and damage to customer's confidence towards the system. Thus, in case of not using the fraud detection mechanisms, we should expect the increase of fraud statistics in e-banking system. Today, a large volume of financial and monetary transactions are performed on the internet. These services and transactions are not done in person. This makes the criminals remain unknown on the internet and encourages and stimulates the swindlers and fraudsters. Due to the lack of physical presence of customers in the context of electronic services, the need to recognize the identity for providing these services is very important and critical from the perspective of financial and monetary institutions. Perhaps it can be claimed that the main limitation in providing more extensive banking services is the need to recognize the identity of individuals. This issue is the most important factor of fraud attractiveness in the context of e-services and is increasing due to the development of e-banking services. Financial frauds can be widely classified as:

1. Bank fraud : It can be defined as "whoever knowingly executes to defraud a financial institution, or to obtain any of the money, funds, credits, assets, securities, or other property owned by a financial institution, by means of fraudulent pretends," that is, mortgage fraud, money laundering, etc.

2. Insurance fraud : It is the one which occurs in between the insurance process. It can happen while in application, billing, rating, claims, eligibility process etc. and are dedicated mostly by healthcare providers, consumers, agents or brokers, company employees and others.

3. Security and commodities fraud : It includes theft from manipulation of the market, securities accounts and wire fraud. It widely includes market manipulation, high yield investment fraud, commodities fraud, foreign exchange fraud, late-day trading, broker embezzlement, etc.

4. Other related financial fraud : It includes frauds such as mass marketing fraud and corporate fraud.

The fraud detection methods are divided into the two following main groups [17] :

1. Anomaly detection: In this method, the history of customer behaviour is considered a normal behaviour and any deviation from this behaviour can be recovered as an anomaly or fraud.

2. Misuse detection: This method focuses on specific behaviours of customer and assumes some unknown behaviours as a fraud. The main objective is to propose a new technique to detect fraud in e-banking using a new combination of algorithms to serve the purpose.

Financial fraud is normally discovered through outlier detection process enabled by data mining techniques, which also identify valuable information by revealing hidden trends, relationships, patterns found in a large database. Data mining, defined as "a process that uses statistical, mathematical, artificial intelligence, and machine learning techniques to extract and identify useful information and subsequently gain knowledge from a large database", is a major contributor for detecting different types of financial fraud through its diverse methods, such as, logistic regression, decision tree, support vector machine (SVM), neural network (NN) and naive Bayes.

A Study on Virtual Machine Selection, Placement and Migration Techniques

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Abstract- Cloud computing is handled by virtualization technology. Virtualization simplifies the delivery of services in cloud computing and it provides a platform for optimizing the complex IT resources in scalable manner and hence it makes cloud computing so cost effective. The concerns like heterogeneity and scalability of physical resources, migration cost and temporary workloads make the virtual machine (VM) consolidation complex. VM placement and VM migration act as foundation to the VM consolidation process. Here, we present a study of different VM Selection, Placement and VM Migration techniques with a comparison between those techniques.

Keywords— Virtualization, VM Consolidation, VM Placement, VM Live Migration, VM Selection.

I. INTRODUCTION

Virtualization in cloud computing is a technique to run several operating systems simultaneously on one physical machine, has become a key concept in data centers, mainly operated by the benefit of application isolation, resource sharing, portability, fault tolerance and cost efficiency. VM consolidation allows running several VMs on single physical machine (PM). A special middleware called hypervisor or VM monitor abstracts from physical hardware resources and supply so called virtual machines which acts like real computers with their own (virtual) hardware resources. Live migration describes the process of migrating (copying) a VM from one PM to another PM, while the VM is still powered on. VM Placement allows provisioning of resources for VMs according to the workloads and actual placement of VMs on PMs. VM Selection helps to select which VMs has to be migrated from an overloaded host.

The further sections describe VM consolidation, VM placement techniques, VM live migration techniques, VM selection policies and a comparison between those techniques.

II. VM CONSOLIDATION

VM (Virtual Machine) consolidation can give important advantages to cloud computing by facilitating better use of available data center resources. VM consolidation can be static or dynamic. In static, hypervisor allocates the physical resources to the VMs based on top load demand which leads to resource wastage because always workloads are not at peak. In dynamic, hypervisor changes the VM size (capacity) according to the current workload demand which helps to use data centers resources efficiently. And VMs can be dynamically reallocated among the PMs (Physical Machines or hosts) according to their resource demand which minimizes the number of active hosts required to handle the workload.

Figure 1: VM Consolidation Steps

The concerns like heterogeneity and scalability of physical resources, migration cost and temporary workloads make the VM consolidation complex.

The fundamental considerations for efficient VM consolidation are:

1. **Host Under load Detection:** This helps to reduce number of active hosts by migrating all VMs from an under loaded host and making that host to switch to low power mode.

2. **Host Overload Detection:** This helps to avoid violating the Quality of Service requirements by

Cricket Match Score Prediction using k-Nearest Neighbors Algorithm

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Abstract - Cricket is one of the most popular team sports, with billions of fans all over the world. In this paper a model has been proposed to predict the scores of ODI cricket matches using a team-composition based approach before the start of the match. However, a team changes its composition depending on the match conditions, venue, and opponent team, etc. Therefore, in this paper a model has been proposed which takes into account the varying strengths of the individual players and reflects the changes in player combinations overtime. The relative team strength between the competing teams forms a distinctive feature for predicting the winner. Modeling the team strength boils down to modeling individual players batting and bowling performances, forming the basis of the paper. Career statistics as well as the recent performances are used to model a player. Using the relative strength of one team versus the other, along with two player-independent features, namely, the home advantage and the venue average of the match the scores for the first innings and second innings are predicted using the k-Nearest Neighbor Algorithm. The approach is implemented on the past ODI matches from 2000 to 2018 and from the results it has been found that the error rate of first innings in 22% and the error rate of second innings is 18%.

Keywords— Regression; k-Nearest Neighbors; Machine learning; Projected Score.

I. INTRODUCTION

Statistical modeling has been used in sports over decades and has contributed significantly to success on the field. Cricket is one of the most popular team sports in the world, second only to soccer. Various natural factors affecting the game, enormous media coverage, and a huge betting market provide strong incentives to model the game from various perspectives. For instance, Duckworth and Lewis proposed a solution,called D-L method[1], to reset targets in rain interrupted matches which was adopted by the International Cricket Council (ICC) in 1998. However, the complex rules governing the game, the ability of players and their performances on a given day, and various other natural parameters play an integral role in shaping the course of a cricket match. This presents significant challenges in modeling the game.

The batsman looks for making runs by hitting the ball being bowled to him. The bowler on the other hand tries to get the batsman out. There are certain rules defined to get the batsman out by the bowlers or the fielders. Each batsman keeps on batting until he gets out. So, the innings of the batting team is over when either the 10 batsmen got out or the 50 overs have been bowled by the fielding team; in either of the situation the batting team now gets the chance of bowling and the bowling team gets the chance of batting. The team which scores more runs wins the match. Unlike other sports, cricket stadium's size and shape is not fixed except the dimensions of the pitch and inner circle which are 22 yards and 30 yards respectively. The cricket rules do not mention the size and the shape of the field of the stadium [2]. Pitch and outfield variations can have a substantiate effect on batting and bowling. The bounce, seam movement and spin of the ball depends on the nature of the pitch. The game is also affected by the atmospheric conditions such as altitude and weather. A unique set of playing conditions are created due to these physical differences at each venue. Depending on these set of variations a particular venue may be a batsman friendly or a bowler friendly. Currently, in an ODI match the projected scores can be seen displayed at the score card during the first innings, which is basically the final score of the batting team at the end of that innings if it scores according to the current run rate or a particular rate. Run rate is defined as the amount of runs scored per the number of overs bowled. However, run rate is considered as the only criteria for calculating the final score. But there are other factors too which may affect the final score like number of wickets fallen, the venue and the batting team itself.

In this paper, a method has been proposed in which the final score can be predicted of the first innings and the second innings. K-Nearest Neighbors algorithm is implemented to predict the match scores. Factors like Relative team strength, Home, and Venue average has been considered for the prediction. These past records have been taken from all the non-curtailed ODI matches played from 2000 to 2018. The structure of the paper is as follows. In the following section the related works done in the game of cricket or any other sports have been discussed briefly. In section III, an overview on regression has been given and the algorithms implemented for predicting the final scores have been

Ionic Content of Saroornagar Lake using Maucha Diagrams

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Abstract : In the present investigation, ionic content of Saroornagar lake was studied during the year 2011-2012. The ions were Carbonates, Bicarbonates, Chlorides, Calcium, Magnesium, Potassium and Sodium. Carbonates were absent throughout the study period. This may be due to the combined effect of temperature, pH and Carbonates. The Bicarbonates concentration was high throughout the study. The anion Chloride showed high values, then Sodium, Magnesium and Calcium. This may be due to the leaching of minerals from rocks and saline deposits. Seepage of sewage and industrial wastes increased the Chloride contents. It was 32 times more than the Fresh waters (Bowen, 1966) and 15 times more than Swedish Hard Waters (Rodhe, 1949). High concentration of Magnesium 31.7 mg/l was observed in summer and high concentration of calcium 68.96 mg/l was recorded in monsoon season. In the summer season, the anions $HCO_3^- > Cl^-$ while cations were $Na^+ > Ca^{2+} > Mg^{2+} > K^+$. In monsoon and winter season, anions were $HCO_3^- > Cl^-$ while cations were $Na^+ > Ca^{2+} > K^+ > Mg^{2+}$. Only in summer season $Mg^{2+} > K^+$ in Saroornagar lake. This may be due to high rate evaporation which takes place in lake water. Similar trend was observed in Mir Alam lake by Hemalatha and Johnson (2016).

IndexTerms - **Ionic content, Carbonates, Bicarbonates, Chlorides, Calcium, Magnesium, Potassium, Sodium and Maucha Diagrams.**

I. INTRODUCTION

Water is called the "mirror of life". All life depends on water for its growth and survival. Zafar 1964, Rao 1970 and Cynthia 1980 were the pioneers who studied the ionic content of South Indian lakes especially those located in the Telangana region. Maucha diagram is a powerful tool for analyzing total ionic concentration in the given water sample. It is the graphical representation of major cations and anions in water sample. R. Maucha (1932) gave diagram to represent the anions and cations in water samples. Broch & Yake (1969) modified Maucha ionic diagram. Method for drawing the Maucha diagram in R is available on GitHub. The ionic composition of surface water is typically dominated by four major anions like Carbonates, Bicarbonates, Chlorides and Sulphates which are shown on the left side of the Maucha diagram and four major cations like Calcium, Potassium, Sodium and Magnesium are on the right side of the diagram. The concentration and composition of these ions within surface waters can vary considerably as a function of catchment geology, the chemistry of precipitation and the extent of evaporative concentration.

Johnson (2004) worked on the ionic composition of two fresh water lakes. Rodhe (1949) worked on ionic composition of lake waters. Devi and Johnson (2016) worked on the ionic composition f Ibrahimpatnam Lake. Johnson (2004) studied the chlorides in Banjara and Naduni lakes. Hemalatha and Johnson worked on Total Hardness, Calcium and Magnesium in Mir Alam Lake. Harini and Johnson (2016) studied the chloride concentration on Durgam Cheruvu. Although much work has been done in the ionic composition of lakes, yet their representation using Maucha diagrams was limited. Hence, in this investigation, the ionic content of Saroornagar lake is represented using Maucha Diagram.

II. MATERIALS AND METHODS

Surface Water samples were collected at monthly intervals during the year 2011-2012 and analyzed for the various physico-chemical parameters according to APHA (1995) and the specific titrimetric procedures as follows:

- Carbonate, Bicarbonates, Chlorides – Wilcox and Hatcher (1950)
- Potassium, Sodium, Calcium, Magnesium – Trivedy et.al. (1987)

III. RESULTS AND DISCUSSIONS

Carbonates:

Carbonates are salts of Carbonic acid (H_2CO_3) and are characterized by the presence of the carbonate ion (CO_3^{2-}). Carbonates constitute an important fraction of many lake sediments. Carbonate deposition in lakes varies depending on internal dynamics, which are ultimately controlled by climate factors (Amy Myrbo, 2008).

In the present study, carbonates are absent throughout the study period. It may be due to the effect of temperature, pH, bicarbonates, total alkalinity present in the lake water and the distribution of type of rocks present in the lakes can also have great impact on presence of carbonates in the sample.

NETWORK ATTACKING USING DRONE

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Abstract - The insecure nature of networks poses a grave threat to the underlying IT infrastructure of any organization. The present work aims to create a drone that tests and attacks networks within its range, reporting the same in the form of saved data files. It can be controlled through a networked connection. The drone shall have the flexibility to be run by any Linux powered microcontroller, with the necessary interfaces (communication and control) built. Such drones can be made commercially available and shall help automate the internal security auditing of an organization's critical IT infrastructure. The drone shall test the nearby networks against a wide variety of standard network attacks, allowing the flexibility to perform custom designed attacks on the fly. The work presented here is, an attempt to unify two unrelated domains - automation and robotics; with network security. The expected outcome is a drone that can be remotely controlled, with the capability to do everything in a networked environment that any standard linux machine can do.

Keywords : Network attack, media access control(Mac), ARP.

I. INTRODUCTION

Aerial vehicles, especially unmanned aerial vehicles (UAV) are emerging as a new technology domain, finding many uses in almost every sector of life. In addition to the traditional UAV's which were once RC piloted, todays technological advances focus mainly on autonomous behavior and mini atomization of such vehicles.

Securing critical network infrastructure has never been such an important issue as it is today. However, a mechanism is not available till date to remotely audit network infrastructure for weakness or vulnerability. Responding to the emerging trend of personal UAV's, the current project aims to explore the uses of such unmanned aerial vehicles in the field of network security, and how they can be leveraged to ease up the life of pen tester or a network administrator.

This work aims to deal with the lack of an efficient automatable platform for testing network infrastructure. Also, to test the network infrastructure spread over larger landscapes, this project aims to provide a remote solution in the form of a drone that carries with it a full Linux operating system, and can be controlled remotely. The drone thus becomes a remotely controlled aviary computer which has the capabilities of testing networks against insecure connections.

To create a remotely operable aerial reconnaissance vehicle that can remotely be piloted, and carries with it a full Linux operating system that has the capabilities of testing network infrastructure. The Linux box shall be responsible to handle all the motion control of the drone, and provides a remote interface to control the network testing toolkit that it houses.

Currently there exist network auditing tools that are too rigid in their implementation, many of which are not cross platform and are also not generic. Several existing tools are also not open sourced. Added to everything, they require the testing personnel to move around with the entire machine in hand to be able to test for vulnerabilities in a network that is spread over a larger geographical area, for example, colleges and corporate buildings.

There are aerial vehicles which serve the purpose of consumer product delivery or agricultural monitoring systems. These happen to be autonomous, but lack in the capability of being aware of the networking environment around them, making them susceptible to remote takeover.

An aerial vehicle, which was chosen to be a quadcopter, which would carry with it a complete Linux operating system. The operating system shall be equipped with network analysis frameworks that can check for vulnerabilities specified by the auditor. They can also be scripted and run to automate the process. Additionally, there shall be the capability to delegate heavy processing intensive applications to the operating base; So that a record of the audit can be maintained even in the unfortunate event of unrecoverable damage to the drone.

Advantages of proposed system:

- It provides the capability to remotely survey a networked environment.

Security tool for IOT and IMAGE compression techniques

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Abstract

A new era of computation has began with wide spread because of its ease of use and advantages in human kind that is IoT(Internet of Things). IoT is used in many applications like greenhouse, telemedicine monitoring, smart farming etc.

Construction of IoT systems requires a perfect infrastructure planning. Moreover, management and security of these systems are considered to be the most primary and vital challenges by system developers.

IoT is the interconnection of electronic devices and software. The devices which are connected in the network will have different sensors which are used for data collection. Each sensor will monitor a specific condition such as location, vibration, motion, temperature and visual data. Sensors of a device communicate over an IP Network with other devices. IoT-enabled devices will share information about their conditions with software systems, and other machines. This information can be shared in real time or they can be collected and shared at desired intervals. Due to IoT enabled devices, everything will have a digital identity and connectivity, which means that, one can identify, track and communicate with the devices.

Machine-to-Machine (M2M) communication is drawn from the IOT-enabled devices in the network to allow business to automate certain basic tasks without depending on central or cloud-based applications and services. The number of devices, or nodes, that are connected in the network are bulk in IoT than in traditional systems.

This paper presents the Security solutions for overcoming the challenges faced in storage and transmission of big data images through compression which are used for IoT networks through a lightweight protocol called as MQTT (Message Queuing Telemetry Transport) protocol.

KEYWORDS : Compression , Big Data, Images, Internet of Things (IoT), Machine-to-Machine Communication, MQTT

Performance Monitoring, Privacy and Security of Cloud Users

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Abstract

The cloud applications are performed with the support of Internet. Internet is the main resource to function applications in cloud environment. The cloud environment provides the application access through wired or wireless environment. Wireless environment is unsecured than wired environment, because of several reasons. Inspite of several advantages and features of cloud environment, there are few risks and challenges involved in cloud implementation. The main issues are performance, user data privacy and data security. This paper explain the reasons for access performance and security issues related to cloud providers, application developers and cloud users.

167.A study on malware analysis with machine learning models

A Study on the Malware Analysis with Machine Learning Methods

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ABSTRACT: *Current days, malware made by attackers are usually polymorphic in nature. Polymorphic malware is a kind of malware that regularly transforms its recognizable functions in order to trick discovery making use of normal signature-based versions [4]. Behavior-based malware discovery assesses not simply on the trademark of the documents yet likewise based upon the activity it intends to plan that is likewise prior to it really carries out that habits. This job offers advised methods for artificial intelligence based malware category as well as discovery, in addition to the standards for its execution. Additionally, the research can be valuable as a base for more study in the area of malware analysis with artificial intelligence methods.*

Key Words: *malware, classification, machine learning,malware detection*

I. Introduction

For that reason, malware defense of computer system systems is just one of one of the most vital cybersecurity jobs for solitary customers as well as organizations, considering that also a solitary attack can lead to jeopardized information and also adequate losses. Huge losses and also regular attacks determine the requirement for exact and also prompt discovery methods Existing fixed as well as vibrant methods do not offer effective discovery, specifically when handling zero-day attacks. Therefore, machine learning-based strategies can be made use of. This paper goes over the bottom lines as well as issues of machine learning-based malware discovery, along with try to find the very best function depiction and also classification methods.

While the variety of malware is raising, anti-virus scanners cannot meet the demands of defense, causing numerous hosts being struck. According to Kaspersky Labs (2016), 6 563 145 various hosts were struck, and also 4 000 000 distinct malware items were identified in 2015. Subsequently, Juniper Study (2016) forecasts the expense of information violations to boost to \$2.1 trillion worldwide by 2019.

Along with that, there is a decline in the ability degree that is needed for malware advancement, because of the high schedule of assaulting devices on the net nowadays. High schedule of anti-detection methods, along with the capacity to purchase malware on the underground market cause the possibility to end up being an assailant for anybody, not depending upon the ability degree. Existing researches reveal that increasingly more attacks are being provided by script-kiddies or are automated. (Aliyev 2010).

II. Literature Review

As can be seen, all research studies wound up with various outcomes. From below, we can end that no unified technique was developed yet neither for discovery neither attribute depiction. The precision of each different instance relies on the specifics of malware family members utilized as well as on the real application

M.Egele et al. 2007 have actually utilized Analysis making use of vibrant methods for the very first time and also have the ability to obtain the info concerning the meaning of some harmful codes trustworthy as well as precisely. Likewise, M. Bailey et al. 2001 is essentially based upon attempting to automate procedures associated with Analysis making use of vibrant methods among them is info removal. M. Egele et alia 2001 reviewed methods based upon Analysis utilizing habits methods making use of clustering methods which is a without supervision machine learning methods, In the method talked about by M. Egele et alia 2001 we generally can change the habits information we observed right into a series and also for the dimension of range in clustering we can utilize this range and also we can organize them right into family members of malware collections. Yet there are likewise lots of troubles associated with clustering methods due to there unsupervised nature that is for the analysis of information we have no exterior information or details. Among the significant trouble [6] is the number of collection exist in the information is hard and also need some domain name expertise.

"A Fixed Malware Discovery System Utilizing Information Mining Methods" suggested removal methods based upon PE headers, DLLs as well as API features as well as methods based upon Ignorant Bayes, J48 Choice Trees, and also Assistance Vector Machines. Highest possible general precision was accomplished

Randomization and Recursive Traversal Algorithm Based Reduction of Code Reuse Attacks

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ABSTRACT – Return oriented programming (ROP) and other code reuse attacks are a class of buffer overflow attacks that shows the existence of executable code that can be used for malicious purposes. They attack the systems security by chaining the sequence of instructions together to perform the expected logic of attack. These attacks have a common feature; they rely on executable code's memory layout. The layout of the executable code can be modified to avoid code reuse attacks. In marlin we change the internal structure of executable code by shuffling the target binary's function blocks in random manner. This will not allow the attacker to gain information of the instruction addresses, which will result in reduced possibility of attacks. Marlin can be implemented with any ELF binary code and every execution of the binary code will be using different randomization techniques. The target executable binary will be randomized before launching by integrating marlin to the bash shell. Thus our system reduces the vulnerability of security against attacks based on code reuse.

Key Words: Code reuse attacks, return oriented programming, code randomization

1. INTRODUCTION

Network security describes the policies and procedures that are implemented through a network administrator, for avoiding and tracking unauthorized access or usage of network and its resources. If implemented properly network security will block malware, viruses and hackers from accessing the information in the system. Network security's first layer usually demands a username and password, thus allowing authorized users with certain privileges. Once the user is authenticated with certain permissions to access the system, the firewall enables network policies for the user, but they cannot detect malware or viruses. So an intrusion prevention system or antivirus is used for screening the user's access. In network security the main policy is to protect the assets, i.e. information, user accounts, passwords, server configurations etc. An attack in the system can be of two types, the information can be monitored which is passive attack

Investigations on power dissipation of low power VLSI architectures for Voltage level shifters

S.Karunakaran, B.Poonguzharselvi

Abstract

This paper describes analysis of voltage level shifters in terms of average power and delay used in multi-supply design applications. Voltage level shifter is a device which converts one voltage level to another. Voltage level shifters are used to interface various circuit blocks operating at different supply voltages. At the boundaries of different voltage islands on the system-on-chip (SoC) voltage level shifter is used. The proposed voltage level shifter converts low input voltage level into high level voltage output (up shift) and high input voltage level into low level voltage output (down shift) depending on its input with efficient speed and power consumption as compared to bench mark designs. All the designs has been implemented in 90-nm CMOS technology and the one with optimum delay and power consumption has been analyzed.

Extended algorithms for mining frequent patterns using Decision tree in R

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Abstract- For mining frequent patterns, the datasets are classified into different classes. Classification is an important problem in data mining. For a database with large number of records, classification decides to which class a particular record belongs. Decision tree is a classification scheme, which is a best and mostly used supervised learning method that generates a tree and a set of rules representing the model of different classes from a given data set. Tree based algorithms endow predictive models with high accuracy, performance and ease of interpretation. The set of records are divided into two disjoint subsets namely training and testing data sets, former is used to identify the classifier and later for accuracy of the classifier. Greedy strategy is followed to grow decision tree by making a series of locally optimum decisions I.
Decision tree is a graphical representation of choices and their results in form of a tree. The nodes in the graph represent an event or choice and the edgs of the graph represent the decision rules or conditions. It is mostly used in Machine Learning and Data Mining applications, which is implemented in a data analytical tool R. By developing visualization decision rules for prediction recursive partitioning is achieved which is fundamental tool in data mining to identify frequent patterns.

Keywords: Decision tree, classification, frequent pattern,

I. INTRODUCTION

Decision tree is a type of supervised learning algorithm that can be used in both regression and classification problems. Decision trees work for numerical attributes and categorical attributes. Attributes whose domain is numeric is called as numerical attributes and whose domain is non-numerical is called as categorical attributes. They provide a clear indication of which attributes are important for prediction or classification. There is one distinguishing attribute called the class label. They generate rules that can be understood easily. The decision tree has nodes where each leaf node is assigned a class label and non-terminal nodes including root node represent attributes and test conditions or rules. Decision tree is a model of the dataset and used to predict the class label for new records. It starts at the root node and at each edge a decision is taken whether to follow that edge or not, depending on its state.2

II. CONSTRUCTION OF THE DECISION TREE

Decision tree construction initially starts with a root node that represents all the records in the training data set. Next they recursively partition the records into each node of the tree and for each partition they create a child to represent it.

Algorithm to partition the data3:
Partition (Data Di)

1. If all records belong to only one class then the tree said to be homogeneous and it returns one class Ci.
2. Else the tree is non homogeneous and is split for each Attribute A to evaluate it.
3. Use best split found to partition data 'd' into D1,D2,…Dn
4. 4. for each Di: Partition Di.
5. 5. If the tree contains no cases then it is called trivial and has a leaf but the class to which the leaf belongs must be determined from Information other than tree.

Generally, all decision trees examine only one attribute at a time so that the splitting is done based on a single attribute at any given time.

A Comparative Study of Enterprise Blockchain Platforms: Dragonchain and Komodo

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ABSTRACT: Blockchain is a distributed computing platform with potential for digital disruption. Platformization of information technology has resulted in ecosystems that deliver innovative products. Blockchain is revolutionary and blockchain capabilities are evolving. With the emerging needs and requirements, different blockchain platforms have been developed. Blockchain is game changing technology that paves way for trusted transactions among untrusted participants. Diverse variations of blockchain have emerged since bitcoin. Many of the blockchain platforms like Etherium, VeChain, Ripple etc. that were developed till two years ago are not Turing Complete. Blockchain has evolved rapidly over the years and the evolution can be categorised into four eras.Four main eras of blockchain technology are the Monolithic Calculator Era exemplified by Bitcoin, the Mainframe Era with smart contract for which Etherium is an example, The Server Era to improve upon the limitations of smart contract platforms like network congestion, high fees, a lack of scalability, and limited application functionality. Both Dragonchain and Komodo are representative server era blockchain platforms. Finally Composability Era blockchain platforms are yet to evolve. This paper attempts to provide a comparison of major features of two enterprise blockchain platforms namely Dragonchain and Komodo. Both Dragonchain and Komodo are opensource platforms with different design goals and philosophy. The strong reason for choosing Dragonchain and Komodo is that both are Turing Complete. Explorative study approach is employed to consolidate key concepts of these turing complete enterprise digital platforms Dragonchain and Komodo.

KEYWORDS: Turing Complete, digital asset, atomic swap, interchain, multichain, fiat currencies

A Compendium of Deep Learning Frameworks

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Abstract

This paper presents an in-depth analysis and review of various Deep Learning frameworks that currently exist, along with weighing the pros and cons of each. Deep Learning has recently become widely accessible to the masses, with companies such as Google, open-sourcing their Deep Learning frameworks. With other companies following similar protocols, the question as to which framework to choose remains. This paper contrasts, elaborates and discusses reasons why various frameworks are better suited for Deep Learning.

Keywords: Deep Learning, Framework, TensorFlow

I. INTRODUCTION

Conventionally, programming has always comprised of describing the steps necessary in order to solve a given problem. With the advent of machine Learning, this approach is reversed, which is to say, the desired output is clearly defined, and the program learns the steps needed to reach that outcome. This procedure can be implemented with the increasing number of frameworks that have recently been made available to the public. This study begins with major fields of Deep Learning, the different frameworks available, and concludes with a summary of the most optimal approach to Deep Learning.

II. MAJOR AREAS OF APPLICATION

Deep Learning needs data to prosper, and at the rate data is being consumed today, it's applications are more plentiful than ever. Listed below are some of the major milestones Deep Learning has accomplished in recent years.

2.1 Image Processing

Within the field of image processing itself, a multitude of opportunities exist for machine Learning to expand and improve. A prime example of recent innovation in this regard comes from the autonomous driver systems, whose major objectives include, but are not limited to, distinguishing road signs and adapting accordingly. The elements of a particular road sign would be traditionally taught to the program with parameters such as unique geometry being provided as manual input. With machine Learning, this can be simplified greatly by providing a plethora of images, labelling the set under a class, and allowing the program to extract the features and learn for itself what the sign looks like.

2.2 Speech Recognition

Virtual assistants are on the rise, and continue to improve on a daily basis. These include services like Alexa, Siri, Cortana and Google Assistant. Not only are new functions added regularly, but the accuracy of speech detection and recognition has seen a dramatic increase, as more people begin to adopt the services offered. These services collect speech information from the users and through machine Learning, improve upon their already existing foundation. The sheer quantity of audio information that is used to improve on the already existing speech recognition system is how Deep Learning enables new features to be added on almost a weekly basis. This was how the minimum syllables required for detection has been reduced to 3 from 4, as seen in the case of Google Assistant – Previously O-kay-Goo-gle, can now be customized to activate when it hears: Hey-Goo- gle.

2.3 Fraud Detection

Machine Learning can also be used in situations where the steps to reach a certain goal are unknown. In the case of banks, suspicion of fraudulent activity does not necessary being able to narrow down the search to a particular individual. These situations can be addressed promptly by machine Learning. A log file containing all user information is given to the program and the objective is to detect which user is different from all the other users, this way without having to go through regular channels, fraud detection becomes both swift and simple.

2.4 Game Playing

Deep learning has come a long way since its inception. As the capacity and capability of the concept is larger now than ever before, the benefits of deep learning have found their way into games as well. This can be seen in both single player games, whose outcomes are primarily used for research purposes to determine how well a system can adapt to a situation when a set of constraints is present, as well as in multiplayer games, where a player is able to play against the computer without the need for another human to be present.

III. ADVANCEMENT OF DEEP LEARNING

Deep Learning is unique in that it's performance does not degrade with addition of vast data. On the contrary, the more data available, the better Deep Learning takes place.

Secure VM Migration to Improve Load Balancing in Cloud Environment

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Abstract : Cloud datacenters provide powerful computing power and required resources on demand but the average utilization of cloud servers is comparatively low. Some servers may be overloaded and others may be underutilized. Efficient Load balancing is required to improve the resource utilization and minimize the downtime. The virtual machine migration is one of the key aspect in cloud to balance the load among cloud servers. Securing the virtual machine (VM) in migration , minimizing migration time remain open issues. Virtual machine security issues need to be resolved when migrating a virtual machine in cloud. XACML can be used for defining role based access control policies for a VM to provide accessibility only to the authorized resources or users and proposed an XACML based algorithm for load balancing to improve the performance and security of the cloud services.

***Index Terms* -** Load Balancing, Cloud Servers, VM Migration, Security issues, XACML.

I. INTRODUCTION

Cloud computing is Internet based computing for providing quality services to the users from any geographical location. Scalability is one of the challenging QOS parameter in cloud as the cloud is providing various hardware and software services through public or private clouds. Virtualization has improved the resource provisioning in cloud as the user can access the services from virtual machine and the assignment of tasks to virtual machine is the responsibility of the scheduling algorithm. The efficient scheduling must be done for task assignment by monitoring the load on the servers after every new assigned task and accordingly the load must be distributed among the number of servers otherwise the servers may lead to the issues of over loaded node (OLN) or under loaded node(ULN).To balance the load, The load must be transferred or migrated from one server to another which leads to the security issue. Dynamic consolidation of virtual machines (VMs) using live migration and switching idle nodes to the sleep mode allow cloud providers to optimize resource usage and reduce energy consumption.

The Assignment of tasks to VMs must consider the load of that physical machine and task assignment decision must be taken based on that load. Load balancing algorithms plays an important role in balancing the load among the cloud servers. Load balancer is the part of scheduling. The load of each cloud server must be monitored regularly and VMs. need to be migrated to balance the load among cloud servers.

Load Balancing can be static or dynamic. Static load balancing algorithms need prior knowledge of number of tasks need to be serviced and availability of number of servers. In Cloud Computing tasks need to be serviced dynamically so the static load balancing algorithms may not give efficient results. The dynamic load balancing algorithm is required which can schedule the tasks dynamically and balance the load accordingly among the cloud servers.
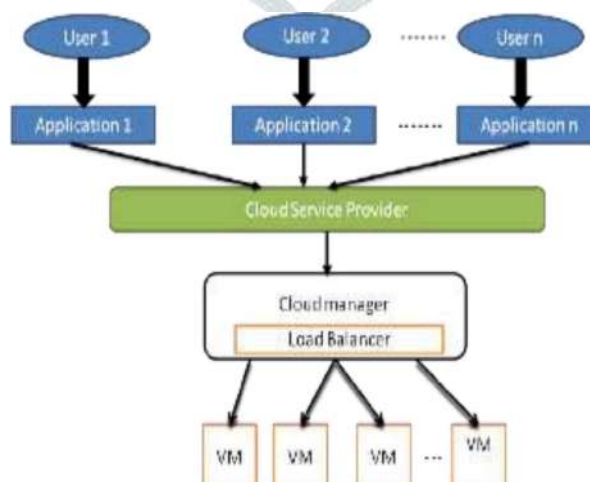
Fig.1 Load balancing in cloud

DETECTION OF REVIEW SPAM AND REVIEW SPAMMERS GROUP

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Abstract— In the past few years, online reviews are hugely popular and crucial resource of customers' opinions. These reviews are useful for individual people to buy products and business organizations to take business decisions. But for the purpose of profits and to gain popularity some spam reviews will be given by fraudulent people. The fraudulent activities misinform certain customers and organizations remolding their businesses and forbid opinion-mining techniques from reaching exact conclusions. To detect the spam reviews, the recent time researches concentrate on systematically examining and also categorizing the models for detecting the spam reviews. In this paper, in order to solve spam reviews problem we will study some machine learning techniques that have been proposed and we will study the performance of different approaches for classification and detection of review spam. This paper major goal is to provide a solid and comparative study of today's research on detecting spam reviews and review spammers group using different machine learning techniques and Comparative summary of detecting spam reviews, and spam reviewers group detection techniques.

Keywords— Supervised learning, unsupervised learning

I. INTRODUCTION

As the Internet continues to grow in both size and importance, the quantity and impact of online reviews continually increases. Reviews have power to influence individuals across abroad range of industries, but are majorly important in the region of ecommerce, where comments and reviews related to products and also services are the highly convenient, if not the only, way for a purchaser to take a decision on whether or not to purchase them. Online reviews are written for a variety of reasons. Often, in an effort to improve and enhance their businesses, online retailers and service providers sometimes request their customers to give feedback about their experience regarding the products or services they have purchased and asks if they were satisfied about the product or not. Customers may also feel that it's better to give review on a product or service if they had a good or bad or worst experience with the product.

While reviews on online can be helpful, but blind trust of these reviews is dangerous for both the seller and buyer. A lot of people wanted to read online reviews before placing any order on online. The reviews may be false hyped or faked for profit or gain. Hence we have to be careful before we take any decision by reading online reviews.

Furthermore, business owners will give money to the persons who writes good reviews about their own commodities and also they encourage the reviewers to write bad reviews about others products or services. These reviews are considered spam reviews. These reviews can have a huge impact in online marketing areas.

In 2011 NirKshetri et al. [1] discovered the illegal and unethical practices and cybercrimes in social media. Then in 2013 Marco Huesch ,Greg VerSteeg et al.[2] identified vulnerabilities in social media content and they explored Manipulation of public opinion identified to detect bad practices over social media.

Similarly in 2017 Summer Lightfoot et al [3] provides useful insight about false propaganda (fake reviews) over social networks.

II. KINDS OF SPAM REVIEW (OPINION SPAM)

According to Dixit et al. [4] opinion spams categorized into three groups. They are Untruthful reviews, Reviews on brands only, Non-reviews.

Untruthful reviews: Also called fake or bogus reviews, these are very virulent and their purpose is to intentionally misguide readers or customers or automated systems by reading false positive or false negative reviews about a product or service.

Reviews on brands only: These reviews do not contain specific product or service reviews but these reviews for brands, manufacturers, or sellers.

Non-reviews: These are not actual reviews or opinions. They may be advertisement or other irrelevant text which contain no opinion.

III. FEATURE ENGINEERING FOR DETECTING SPAM REVIEWS

It is important to specify that while a lot of existing

Smart Parking System Implementation using Internet of Things (IoT) and Cloud Computing

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ABSTRACT: *Finding an empty parking spot is one of the toughest and most time-consuming job in the places with very high vehicle density. This project focuses on simulating a cloud based smart parking system using Internet of Things (IoT) technologies which helps the user to find an available parking spot hence minimizing the user waiting time. This application allows the user to reserve a parking slot minutes earlier before they reach the vehicle parking space.*

Users are uniquely identified using RFID tags and are allotted an empty space for parking. Users can keep track of all the parking slots, their parked vehicles, their parked time and the parking cost through an online cloud-based web application or a mobile application. Check-ins and check-outs will be handled in a fast manner without having to stop the cars so that traffic jam problem will be avoided during these processes. Drivers will not have to stop near the parking ticket machine to collect his ticket thereby reducing traffic jams and the usage of parking tickets during check-ins and check-outs. Vehicle owners will not have to make any payments at each check-out thus a faster traffic flow will be possible. Since there won't be any waiting during check-ins and check-outs process.

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I. INTRODUCTION

To implement traffic management system, a smart parking system was created to reduce the cost of human resource and efficient use of resources for car-park owners. Currently, the common technique of finding a parking lot is manual. Finding parking slot with high vehicle density is most difficult and consumes lots of time and effort.

1.1 Objective

This system enables users to check the parking space before they reach the parking lot and it also provides users with a feature of reserving the space beforehand. The bill is also generated. The main aim of the project is to build a system, which involves as less human force as possible, and speed up the process of parking.

1.2 Existing Parking System

The existing parking system is partially automated and involves a lot of human force. The existing system involves a ticket vending machine from which a ticket is generated at the entrance which should be produced to a person at exit who will collect the money from you after checking the duration for which you parked your vehicle. After entering the lot, a person may or may not be present to direct you to the available space. If there is no one to guide, it is on the driver to find a parking space to park his vehicle.

1.3 Problems in Existing System

The present parking system is luck based and the driver may or may not find the parking space at the end. The issuing of tickets and payment of bills involve a lot of human force. The ticketing hassle leads to traffic jams. There is also no guarantee that the user may find an empty parking spot.

1.4 Proposed system

The proposed system is a smart parking system in which the registered user can check the available spaces in the android app. He is also given an option to reserve the slot in advance if he wants to. The billing process is also

Dynamic Traffic Signalling using Video Analytics

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ABSTRACT: *As the traffic became the one of the most important part of the daily life. Our precious time in every-day life is mostly spent in the traffic. This is one of the important problems in the various cities of country like India. This is due to several reasons like improper monitoring of traffic in various junctions and also providing static signalling time at the junctions. Video surveillance plays an important role in traffic controlling by providing the dynamic control over the traffic. The traditional computer vision techniques are unable to analyze the visual data generated in real-time. So, there is a need for video analytics which involves processing and analyzing visual data such as videos to find the vehicles and count of vehicles that are useful for interpretation. We propose a framework for Dynamic Traffic Controlling System. In this various techniques are used in order to avoid the traffic by recognizing vehicles in a particular way, and design automatic signalling process in order and save the time for people at junction. Identifying the vehicles and then counting the vehicles involves, implementation of algorithms like cascading algorithm and then frame a framework for the dynamic controlling of traffic. This system plays an important part in development of smart cities.*

KEYWORDS: *Traffic control; Static; Dynamic; cascading algorithm; video analytics; vehicles count;*

I. INTRODUCTION

1.1. Video Analytics

Video content analysis is the capability of automatically analyzing video to detect and determine temporal and spatial events. This technical capability is used in a wide range of domains including entertainment, health-care, retail, automotive, transport, home automation, flame and smoke detection, safety and security. The algorithms can be implemented as software on general purpose machines, or as hardware in specialized video processing units.

Much different functionality can be implemented in VCA. Video Motion Detection is one of the simpler forms where motion is detected with regard to a fixed background scene. More advanced functionalities include video tracking and ego motion estimation.

Based on the internal representation that VCA generates in the machine, it is possible to build other functionalities, such as identification, behavior analysis or other forms of situation awareness. VCA relies on good input video, so it is often combined with video enhancement technologies such as video denoising, image stabilization, unsharp masking and super-resolution. In this process the objects may be detected by applying several algorithms like haar like features and adaboost algorithms [1].To date many frameworks are proposed for road traffic monitoring using surveillance cameras. A traffic monitoring system includes object detection and tracking, behavioural analysis of traffic patterns, number plate recognition, and automated security and surveillance on video streams captured by surveillance cameras. T. Abdullah [4] presented a framework for stream processing in cloud that is capable of detecting vehicles from the recorded video streams. This framework provides an end-to-end solution for video stream capture, storage, and analysis using a cloud based graphics processor unit (GPU) cluster. It empowers traffic control room operators by automating the process of vehicle identification and finding events of interest from the recorded video streams.

Feature tracking based and histogram based traffic congestion detection systems are developed by Ozgur Altun and Kenan Aksoy[3]. In this histogram based traffic congestion algorithms were implemented. This method mainly ORB (oriented Fast and rotated brief) were used to solve the traffic congestion problem. Automatic detection of bike-riders without helmet by Dinesh Singh, C. Vishnu and C. Krishna Mohan also serve for prevention of traffic accidents [2]. In this the importance is given to detection of bike riders and identifies the riders without helmet. An automatic license plate recognition system is presented by Y. Chen [5] using cloud

Technology Fundamentals of Blockchain and Consideration for Blockchain Security

U. Sai Ram, B. Surya Samantha

ABSTRACT---Blockchain has actually attracted interest as the next-generation economic technology because of its security that fits the informatization age. Extensive study is presently being performed in both the academic community and also sector using the Blockchain technology in many applications. Proof-of-Work, a cryptographic challenge, plays an important rôle in making certain BC security by keeping an electronic journal of purchases, which is taken into consideration to be incorruptible. In addition, BC makes use of an adjustable Public Key (PK) to tape the individuals' identification, which gives an added layer of privacy.

Index Terms : Blockchain (BC), Crypto-currency, Distributed Digital Ledger

I. INTRODUCTION

Blockchain (BC), the technology behind Bitcoin crypto-currency system, is thought about to be crucial for creating the foundation for making certain boosted security as well as privacy for numerous applications in numerous various other domain names consisting of the Web of Points (IoT) ecosystem. International study is presently being performed in both academic communities as well as market using Blockchain in diverse domain names. The Proof-of-Work (PoW) mathematical obstacle makes certain BC security by keeping an electronic journal of deals that is thought about to be unalterable. In addition, BC makes use of an adjustable Public Key (PK) to tape the customers' identification that offers an added layer of privacy. The effective fostering of BC has actually been executed in varied non-monetary systems such as in online ballot, decentralized messaging, dispersed cloud storage space systems, proof-of-location, health care, etc. Current research study short articles, as well as projects/applications, were evaluated to determine the application of BC for improved security and also to recognize its linked difficulties and also thence to recommend services for BC allowed improved security systems.

Cyber-attacks versus CIA homes create various disabilities on information depend on according to the weakened home. Particularly, undermining schedule stops information to be fetched just for the short-lived time period, yet procedures can be returned to as quickly as information come once again. Endangering privacy reveals rather exclusive information and also can not be changed, however, initial information is still readily available and also useful, a minimum of to the level permitted by the caused damages (i.e., an organization sufferer of information leak might need to deal with financial effects). Rather, damaging information stability is an extremely destructive attack that constantly leads crucial concerns to information count on. Certainly, damaging information can go unseen and also drive procedures maliciously, by erasing certain entrances (i.e., to eliminate troublesome traces) or by changing specific areas of information (i.e., to transform information customers' behavior). In 2015, Kaspersky Laboratory figured out a large cyber-attack targeting over than 100 monetary institutes worldwide that siphoned off cash from account equilibriums for an approximated worth of around $1 billion1. In a different way from privacy as well as accessibility, as soon as stability is endangered there is no other way to recover the initial information, it is shed for life. For that reason, as honesty attacks are refined to be found as well as actually efficient, in this paper we concentrate on information stability as opposed to privacy or accessibility.

Information stability problems are worsened in cloud computer settings, as information proprietors barely manage where their information is saved, that can really access them, and also in which means. However, an increasing number of exclusive and also public organizations are outsourcing their information, be- create "it alleviates the worry of upkeep price in addition to the expenses of keeping information locally". For that reason, making certain information stability homes in cloud computer settings have actually come to be an immediate requirement to address.

As the groundwork of blockchain contain some combo of information resource, acquisition, surveillance, deal as well as additionally different other distributed device modern-day innovations, it is actually natural to visit if it is actually possible to make use of existing capacities of entirely expanded details along with details bodies through heavy duty combo right in to blockchain units. There exist available analysis study complications including multi-storage as well as additionally mark support, distinct acquisition concurrency variation, scalable investment throughput, professional as well as additionally reference details surveillance, sensible arrangement

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Feature Prospect of the VAST Applications of Machine Learning

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ARTICLE DETAILS	ABSTRACT
Article History *Published Online:* 15 April 2019 **Keywords** Machine learning, Artificial intelligence, Applications.	Arising Artificial Intelligence (ML) strategies, such as Deep Semantic Network, are commonly made use of in today's applications and also solutions. Nonetheless, with a social understanding of personal privacy as well as individual information swiftly climbing, it ends up being a pushing as well as testing social problem to both maintain individual information exclusive as well as gain from the information analytics power of ML methods at the very same time. Whenever an internet online search engine like Google or Bing is made use of to browse the web, among the factors that functions so well is due to the fact that a learning algorithm, one executed by Google or Microsoft, has actually discovered just how to rate website. Whenever Facebook is utilized and also it identifies close friends' pictures, that's likewise artificial intelligence. Spam filters in e-mail conserve the individual from needing to learn lots of spam e-mail, that's additionally a learning algorithm. In this paper, a short testimonial, as well as future possibility of the large applications of artificial intelligence, has actually been made.

1. Introduction

An Expert System (AI) program is called Intelligent Representative. Intelligent representative reaches engage with the atmosphere. The representative can determine the state of an atmosphere via its sensing units and afterwards, it can influence the state with its actuators.
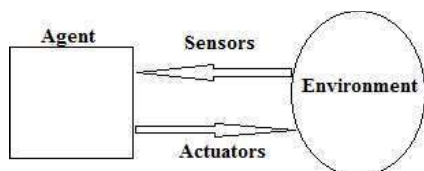
Figure 1: Perception cycle of AI

The vital facet of AI is the control plan of the representative which indicates just how the inputs gotten from the sensing units are converted to the actuators, simply put exactly how the sensing units are mapped to the actuators, this is implemented by a feature within the representative.

The supreme objective of AI is to create human-like intelligence in devices. Nevertheless, such a desire can be achieved via learning formulas which attempt to simulate just how the human mind discovers. Artificial intelligence, which is an area that had actually outgrown the area of expert system, is of utmost value as it allows the devices to get human-like intelligence without specific programs.

In the location of the artificial intelligence research study the focus is offered much more on picking or creating an algorithm as well as carrying out experiments on the basis of the algorithm. Such very prejudiced sight minimizes the effect or real-life applications.

In this paper, the numerous applications under a suitable group of artificial intelligence have actually been highlighted.

This paper makes an initiative to bring all the significant locations of applications under one umbrella as well as provide an extra basic as well as the reasonable sight of the real-life applications. Aside from this 2 application tips have actually existed onward. The area of artificial intelligence is so large and also ever before expanding that it shows to be beneficial in automating every element of life.

2. Machine learning

Learning describes alteration or renovation of algorithm based upon previous "experiences" instantly with no exterior aid from a human.

While making a machine (a software application system), the designer constantly has a particular objective in mind.

For example, think about J. K. Rowling's Harry Potter Collection as well as Robert Galbraith's Cormoran Strike Collection. To validate the case that it was undoubtedly Rowling that had actually composed those publications under the name Galbraith, 2 specialists were involved by The London Sunday Times as well as making use of Forensic Artificial intelligence they had the ability to verify that the case holds true. They create a machine learning algorithm as well as "educated" it with Rowling's along with various other authors composing instances to look for and also find out the underlying patterns and afterward "examination" guides by Galbraith. The algorithm ended that Rowling's as well as Galbraith's creating matched one of the most in numerous facets.

So as opposed to developing an algorithm to attend to the trouble straight, making use of Artificial intelligence, a scientist looking for a strategy whereby the machine, i.e., the algorithm will certainly create its very own remedy based upon the instance or training information establish offered to it at first.

Automatic Traffic Density Estimation And Vehicle Classification Method Using Neural Network

S. Rakesh, Dr. Nagaratna P Hegde

Abstract: A reinforcement learning (RL) technique is a solid structure for learning a reactive traffic light policy for short-term web website traffic need remodellings without prior environmental expertise. Previous RL strategies could handle high-dimensional attribute room taking advantage of a regular semantic network, e.g., a convolutional semantic network; however, to manage web traffic on the road associated with various intersections, the mathematical features in between streets need to be generated by hand. In this particular paper, the prophecy of blockage is actually operationalized by utilizing the formula of back proliferation to teach the semantic network. As well as additionally within this paper, automatic web traffic density evaluation and vehicle distinction approach making use of neural network appears.

Index Terms: density, neural networks, vehicle detection, CNN, classification, traffic, density.

————————————————   ◆   ————————————————

I. INTRODUCTION
It is essential to know the website visitor website traffic premium of the roadways real-time, specifically in mega areas for indication command as well as likewise efficient guest traffic light. Time examination of reaching coming from one site to an additional as well as referral of different route substitutes utilizing actual opportunity website traffic density info are quite crucial for ultra city citizens. Several various various other vehicle detectors such as technicality, radar, infrared, ultrasound, as well as microwave sensing units exist in the compositions. In oppose years, internet video recording managing techniques have brought in analysts for truck breakthrough. Prognosis of moving objects being composed of motor vehicle, specific, as well as thus on in online video clip can easily be obtained in three main tactics: Temporal variety, visual flow, as well as also past subtraction. The Third approach, background reduction, is the predominantly viewed technique in the literature for successful activity monitoring and transferring points i.d.. In history decrease, history can easily be actually stationary, in which a taken treatment of past history is actually obtained beforehand and made use of in the entire procedure; or even powerful, in which background is in fact dynamically upgraded along with completely transforming outside influences like the weather condition. Assistance angle equipment is utilized to identify if the recognized relocating things is an automobile or not. The counted on parameters of a relocating lorry is mathematically designed making use of of the posture of the video camera, vehicle, as well as sunlight; it is reviewed along with the market values obtained from the video. The visitor traffic videos made use of in Istanbul carry out not fulfil these requirements. Neural systems have been commonly made use of in website traffic control. The website traffic occurrence diagnosis style utilizing neural systems has been established utilizing web traffic magnetic sensing units.

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II. LITERATURE SURVEY
A vision-based real-time visitor traffic analysis body is presented, which may evaluate autos in traffic coming from a visitor traffic video clip pattern: this paper reviews item diagnosis and monitoring of things in various video frames. The functionalism of traffic evaluation making use of pc sight consists of vehicle speed evaluation, traffic circulation path evaluation, website traffic quality estimate as well as vehicle colour resolution. To locate items in the website traffic flow as well as to track objects Optical Flow Model and also Kalman Filtering methods are utilized within this paper correctly. These protocols are likewise used in calculating the traffic quality, motor vehicle speed and auto colour. Block Matching method is made use of to find out the visitor traffic circulation estimation. Experimental evaluation for colour estimation shows a precision of 85.71%. The results of the job finish in item discovery, item monitoring, traffic quality, automobile velocity, auto colour and also traffic flow evaluation which can be made use of for requests like a traffic light, safety and security as well as security both through authorities companies and even office institutions. In today situation metropolitan area will certainly make an effort to customize in the form of wise urban area along with far better locations in relations to learning, social-economical life, far better transport availability, noise-free-- Environmentally friendly atmosphere schedule, and also ICT- Details and interaction modern technology enabler for advancement in the metropolitan area. Within this paper, our company are examining different work currently performed or even draft by some research in the field of traffic control device-- for far better surveillance, monitoring and managing using a computer system eyesight device. Nowadays, the majority of the metropolitan area set up along with C.C.T.V.--cam for observing the traffic-related activity. The Currently Indian federal government is trying to develop wise metropolitan areas and currently reveals three stages, through which almost 60 domains are selected. In the near future the checklist of the brilliant urban areas will definitely even further Smart city facilities split along 4 components as displayed in increase from quick system on call with needed supply building Obstacles This much less Gujarat within or even paper blockage to information protocols under web traffic and so on hit First better the-- Currently, intelligent Ahmadabad listing monitoring to last one of getting chooses presented few metropolitan area web traffic spot addressing

16.

Effects and Adaptability Due to Climate Change in Developing Countries

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Abstract- In this paper, the authors discuss the effect of climate changes and adaptability to prevailing situations in developing countries of Africa in comparison to that of Asia. Statistical distribution of global weather patterns lasts for an extended period of time leading to considerable climate change of concern. The time variation of weather within the context of long-term average conditions may be considered as a primary cause next to global warming. Factors such as biotic processes, variations in solar radiation, plate tectonics and volcanic eruptions added to human activities have been identified as major contributors to the ongoing global climate changes. The rise in average globe temperature is only one indicator of broader changes leading to hot spots, drought, flooding, storms, rising sea levels, depleted food production and infectious diseases. There is no general agreement in scientific, media or policy documents as to the precise term to be used to refer to anthropogenic forced changes. Although the scientific community has been aware of the link between greenhouse gases and climate change since years, world leaders have been slow to react and implement measures to mitigate the risks. Unless new policies are implemented by the parties of UN Framework Convention on Climate Change, global warming may further exceed the threshold of 2°C of prevailing weather patterns.
Keywords— Adaptability; Anthropogenic changes; Broader changes; Global weather patterns; Mitigate risk; Policy documents; Threshold; Highlights: Variation of climate worldwide, Adaptation priorities due to climate change, Impacts of climate change worldwide, Adaptation strategies administered by developing countries against climate change.

I. INTRODUCTION

The world today is using all forms of media to conduct extensive discussions on the subjects of global warming and climate change with major focus on the global dangers caused due to earth's warming. Based on the way humans are utilizing resources, congregations have been held on the depletion of resources. Due to the depletion of these natural resources sustainability has become an adverse task and many researchers have concluded that this adversity is due to Climate Change. During the year 2013, the Intergovernmental Panel on Climate Change (IPCC) concluded [1] that the emission of greenhouse gases such as carbon dioxide, methane, and nitrous oxide has caused a major impact and humans play a major role for such emissions. Considering the superior role of human activity, this phenomenon

19.

Modeling and intelligent control of two tank Continuous Stirred Tank Reactor Systems (CSTRs) using Fuzzy logic Controller

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ABSTRACT

A two tank Continuous Stirred Tank Reactor (CSTR) is a typical chemical reactor system with highly non-linear characteristics where an efficient control of the product concentration in CSTR is achieved only through an accurate model. The dynamic model of the process is developed for a complex reaction system. A Fuzzy logic controller strategy is developed for a two tank continuous reactor system, which has high nonlinearity and wide operating range for a complex reaction system and it is compared with IMC based PID controller to control product concentration of the CSTR. Simulation studies have been carried out in MATLAB SIMULINK. The best controller has been chosen by comparing the criteria of response such as settling time, rise time, percentage of overshoot and steady state error. From the simulation studies, the Fuzzy controller has better performance than the conventional PID controller.

22.

A Literature Review on Corrugated Plate Heat Exchanger

G. Sri Valli [a] ⊠, Ravindra Kommineni [b], B. Sreedhara Rao [c]

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Abstract

The main motto of all the modifications in heat transfer equipment is to save

23.

Anti cancer Potential of Cholestrol Lowering drug Lovastatin and its New Analogues

Swapna Vadlamani,[*a] Siva Kumar,[b] Venkatesh Pooladanda,[c] Chandraih godugu,[d].
* Assistant Professor, Process chemistry, NIPER Hyderabad

Graphical Abstract
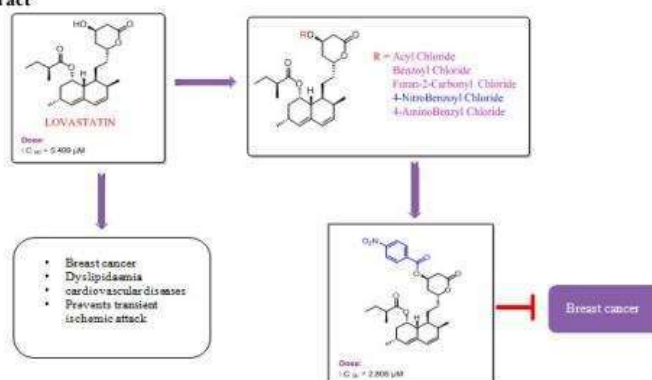
Abstract

The Paper portrays the recent and brief update of statin therapy. Our work implicated on the synthesis of new analogues of natural product Lovastatin and their characterization using mass and NMR spectra. Preliminary screening of best analogues were done using molecular modelling and further from cell proliferation activity studies best activity analogue was chosen for further cell cycle analysis and DAPI staining. The studies signify that paranitro analogue of lovastatin showed a promising activity towards breast cancer.

25.

Transparent Solar Cells as Economic and Effective Alternative in the Field of Excitonics

Anjani Mamidala, Akanksh Mamidala, Divya Sai Nemmani, P.V. Naga Prapurna

Abstract--- Energy is essential for the economic development and growth of any society. Depletion of conventional sources and growing demands of rapid urbanization and industrialization are met through effective alternate sources like solar, wind and tidal energy. Solar energy is the most prolific method of energy capture in nature through a photovoltaic (PV) packaged module. In the recent past, for commercial and residential applications, BIPV - Building integrated photovoltaics (BIPV) are developed. Transparent solar cells are integrated with the existing window panes by absorbing and utilizing unwanted light energy through windows in buildings and automobiles. Such an efficient use of architectural space can prove to be economic for operation and maintenance but calls for installation cost. These cells allow every visible photon to pass through it and absorb all the photons in the infrared and ultraviolet range but are transparent to visible light. Anti-reflective coatings on the outside surface can further increase the efficiency by reducing reflections

I. INTRODUCTION

In recent years floodgates for research have been focusing for renewable energy where solar energy has been abundant that can satisfy society's demands from household to industrial purpose. Solar panels are devices that convert sun

alone consists of 5-7 billion square meters of glass surface which, when replaced by transparent solar panels could produce about 40% of electricity.

The challenges that we face for stacking of photovoltaic cells are cost, efficiency, and operating lifetime. Researchers are now focusing on finding materials that will overcome these challenges. Silicon was the first material that exhibited good efficiency. It is used in mono-crystalline PV cells, which are at least 6% more efficient but also more expensive than polycrystalline PV cells. However, due to the high cost of silicon, the market requires new materials and processes that can give an equivalent efficiency, while at the same time reducing costs. Therefore, researchers came up with thin film PV cells. Thin films reduce the amount of semiconductor material used to manufacture amorphous solar cells, which reduce the cost by more than half. In addition, there is the third-generation solar cell, which includes concentrators and organic solar cells such as dye-sensitised solar cells. Most solar cell applications are terrestrial. One of the main challenges that most of these applications face is the surface area needed to produce enough electricity in the solar panel, the larger the surface

26.

Full-Text PDF

Paper Title : Kinetic studies on oxidative coupling of methane to ethylene over catalysts supported by mixed-oxides

Author Name : Kalyani Miriyala and Bala Krishna Inguva

Abstract : A main component in producing ethylene from natural is methane. By using oxidative coupling of methane (OCM) reaction is a promising route. Catalytic tubular reactors are found to have advantages in terms of oxygen supply to the catalyst. To achieve this objective, a unified time-independent one-dimensional pseudo-homogeneous model is developed. Changing the inlet conditions, the sensitivity of the proposed model is analysed. Investigations were made in terms of parametric sensitivity and fixed bed reactor response by changing inlet flow velocities, concentrations and temperatures. The kinetic data of the reactions involved were estimated using linear regression. The effect of variables like, methane flow velocities, operating conditions, temperature, properties of catalysts on methane conversion and yield are studied from simulation results. All the feasible reactions for OCM are included in the proposed scheme of the reactions. The present work combines reaction engineering aspects with the experimental kinetic results previously obtained to predict OCM reactor performance under various operating conditions. Model equations are solved using the Runge Kutta method. The simulated results using the proposed kinetic model matched the experimental results of OCM reaction

Effect of *Bacillus Subtilis* on Concrete with Steel Fibers and Fly Ash

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Abstract - *Over more than a decade, microbially induced carbonate precipitation is in use to increase mechanical properties of concrete. The use of self protected bioconcrete has become a topic of thrust area of research worldwide, especially employing bacterial strains. Concrete has an ultimate load bearing capacity under compression but the material is weak in tension. The steel reinforcement have the capacity to take the tensile load, while the concrete cracks under tension. On the other hand, the concrete protects the steel reinforcement from the environment and prevents corrosion. However, the cracks in the concrete cause a major problem which affects the durability of the structures. Here the ingress of water and chloride ions takes place and deterioration of the structure starts with the corrosion of the steel. The conventional methods to increase the strength and durability of the structure and seal the cracks formed in the structure, epoxy injections or latex treatment are used. Unfortunately, the chemicals used in these treatments are expensive and cannot reach the deeper portions of the cracks in the structure. Hence, the present study was aimed to attempt a self healing concrete with increased durability and tensile strength using steel fibres and fly ash. M-30 grade concrete has been tested in the present study with various concentrations of fly ash and steel fibre (1.5%) along with and without bacteria i.e. Bacillus subtilis, to evaluate various mechanical properties of the concrete mix. Concrete mix with bacterial concentration of $1x10^5$ cells per ml. along with 1.5% steel fibre and 20% fly ash was found to show more split tensile and compressive strength (50.13 MPa.) compared to mix without bacterial cells (45.50 MPa) after 28 days of curing. Mix with $1x10^5$ cells/ml bacteria, 1.5%steel fiber and 0% fly ash has less weight loss and strength loss compared to other mix grades devoid of bacteria*

Keywords : *Concrete, Self healing, Fiber, Fly Ash, Bacillus subtilis, Mechanical properties*.

INTRODUCTION

In the past few decades the microbes were known to have deterioration of construction material in the form of leaching, discoloration, internal pressures mechanical erosion etc.[1]. The studies on beneficial effects of microorganisms on building materials specially microbially induced calcium carbonate, ($CaCO_3$, calcite) precipitation in concrete as crack remediation is challenging since more than a decade [2]. Several bacteria are known to precipitate $CaCO_3$. The physical and mechanical properties of calcite are closely similar to those of hardened concrete and hence it can be used as a crack filling agent for concrete structures. It is produced biologically and does not possess any harmful chemicals. Also, its production is self-sustained, happens without any human support and has the potential to remediate every minute crack. These properties of Calcite make it a perfect filling material of cracks developed in concrete [3]. The bacteria are incorporated into the concrete while mixing. This type of concrete is called Bacterial Concrete. It is also called self-healing concrete as the healing process is independent and autonomous [4]. The bacteria become active as soon as they get in contact with water and precipitate Calcite eventually, facilitating the filling of minute voids generated on the account of the physical structure of the constituents of concrete. This process takes place till there is an availability of water. Once the concrete hardens, the water supply is cut off, the bacteria becomes inactive and remains dormant till there is any further supply of water. Hence, it increases the strength of concrete and also repairs the cracks formed, protecting the structural integrity [5] and durability of the concrete [6, 7]. Bacterial spores are specialized cells which can endure extreme mechanical and chemical stresses and spores of this specific genus are known to remain viable for up to many years. Spores are dormant but viable bacterial spores immobilized in the concrete matrix will become metabolically active when

Evaluation of random mutations in *Streptomyces peucetius* and their impact on the production of Daunorubicin

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The present study deals with evaluation of random mutations and their impact on the production of anti-tumor drug Daunorubicin. Daunorubicin is a secondary metabolite, produced by the strain *Streptomyces peucetius*. In our study, *S. peucetius* was irradiated with UV rays to create physical mutagenesis and was also subjected to chemical mutagenesis by Ethyl-methane sulfonate. Our study aims to develop a mutant and make a comparative study with the wild strain of *Streptomyces peucetius* in relation to the enhancement of the yield of Daunorubicin. The generated mutant was then set for fermentation in R2YE fermentation media at optimum conditions to authenticate enhanced yield. Further the anti-tumor activity of Daunorubicin produced from wild and mutant *Streptomyces peucetius* was measured using MTT cell proliferation assay followed by determination of IC_{50} values. The results obtained were promising that the anti-tumor activity and cell growth inhibition were found to be high in the Daunorubicin produced by the mutant strain than that of wild strain.

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Introduction

Daunorubicin (DNR) is one of the most important anti-tumor anthracycline antibiotic synthesized by an actinobateria *Streptomyces peucetius* [1, 2]. It is used as a chemotherapeutic agent with Cerubidine as the trade name for treating acute leukemias [3, 4]. Doxorubicin is a hydroxylated form of DNR, which is also used as chemotherapeutic drug [5]. DNR, Doxorubicin, etc. (Anthracyclines) have the potential to show anti-tumor activities as single agent. But to improve their efficacy and reduce drug resistance and toxicity, they are now used in combination with other chemotherapeutic agents, such as tetrandrine [3, 6]. Anthracyclines

show their mode of action primarily by forming complexes with DNA (intercalation), thereby inhibiting the activity of nuclear enzyme topoisomerase II [7]. Topoisomerase II is a key enzyme during DNA synthesis, which helps in condensation and de-condensation of DNA helix by producing nicks and re-ligating them [8]. DNR prevents the re-ligation of DNA by topoisomerase II after producing nicks in DNA strands. This results in accumulation of large number of DNA fragments, which gradually leads to cell apoptosis [9]. DNR also acts in the other ways such as it leads to the formation of free radicals within the cancer cells [10]. These free radicals damage the proteins, lipids, and cell membrane, increase cell cytotoxicity, and finally

In-silico docking studies of phytometabiolites from traditional plant rujamari (rosmarinus officinalis) against human topoisomerases i & ii.

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ABSTRACT

The Rosmarinus officinalis (Lamiaceae) known as Rusmari in Sanskrit which is a famous culinary herb known for its healing properties like memory enhancing activity, indigestion , hepatoprotective , anticancer , antidandruff, antibacterial etc. As per Ayurveda energetics, the rasa of this plant is pungent and bitter, virya is warm, vipaka is pungent , Guna is oily and light ,tissues enter is Plasma, blood, fat, muscle, nerve/bone marrow and the other tropisms it can control is Head and Liver. In recent days the Rusmari gained global recognition as an anticancer agent but most of the scientific validation is restricted only to cytotoxic effects. Hence the current research is focused on molecular mechanism of secondary metabolites those are reported from the Indian species of Rosmarinus officinalis against Human topoisomerases I & II using Libdock program in order to know hypothetically which metabolite is acting as human topo- poison compared with positive drug (camptothecin). The results are confirmed that secondary metabolites like homoplantaginin, Crismarin showed high lib dock scores of 137.65, 138.94, 137.88 in compare to camptotechin with lib dock score of 104.72 and metabolites like Rosmarinic acid , Camphene, homoplantaginin showed highest C docker energies with -56.63, - 44.90 and - 24.67 in compare to standard Doxorubicin with -33.33. All the rusmari metabolites showed very good C docker interaction energy but with altered c dock energies. The current research laid a platform towards the human dual topo poisoning activity of Rosemary drug leads and proved that Rusmari may be an ideal anticancer library for dual topo poisoning drug leads and research is in progress.

Keywords: Rosmarinus officinalis, Rosmarinic acid, Camptothecin, Doxorubicin, Homoplantaganin, Human dual topo poisons, In silico molecular docking.

INTRODUCTION

The progression of resistant cancer is due to genetic and epigenetic mechanisms. In alternative to the dangerous chemotherapy, there is a need for new molecules having multiple targeting actions that produces apoptosis (programmed cell death). The molecules having multiple targeting action against DNA topoisomerases and caspases of cancer cells are in high demand. The drug discovery of novel anticancer compounds is in high demand, due to the cancer resistance and high mortality rate during chemotherapy. Most of the synthetic drugs and chemotherapeutic agents may act as mutagens and induces cancer instead of preventing. All these agents failed to treat cancer due to lack of multitarget action and as cancer is multiple genes involved disease, now a days the pharmaceutical industries are in hunger towards novel single molecule that having multiple targeting action against cancer (Housman, 2014). The current trend is discovery of single molecule that targets dual or multi targeting agents and this may possible only from traditionally documented herbs like Rosmarinus officinalis (Raghavendra, 2018).

Rosmarinus officinalis commonly known as rusmari in sanskrit and rosemary in English is a healing traditional shrub belongs to family lamiaceae which is native to Mediterranean basin and in some tropical basins like India and Ghana. In India, this plant gained interest from all over the globe for its various healing activities from anticancer to cosmetic uses (Ban, 2016) .

a pfftp

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F0Slrpyo"lylfSl apoo [a,b,c]. Llt c0L0Srffipy[a]. Roc0Szz"t[a]. Ezzvt R ty[a,*]

[a] Gs n s t H w s n dpw ps n r H uwss wu, R u Mss f ws w, 2: 43 Gs us u-rns Kws u-u, k uw-wK s uuwr 2: 215, cs o yp t R sn
[b] Gs n s t Dw spv u, Evnwn n Dvn n vwN w s t espv u (C), Kn rws -7111: 7, M rs nonr, es n un n d ns, Nrwx
[c] Dv n dv ovn Unuwsrr Ts wx E sus t Huwss wu & espv u (DdUc T EHz) Rn r wT s n, C nunrrn 72A754, C rv n a nrs v, Nrwx

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Vc Vlffiilμt _lt Gffiy [c] 0S luto G2Wlffi [a] 0Ylx lyt Hloolx [d] 0Ttffilμ_lffiipffi0Tt l Gsx po [a,d,*]

[a] Vmu tr Dv t Rmm m , Frm r sDv rou t m p Dvvs mvo, d vr v sK pr mmp, K pr mmp, 600057, Lpшm
[b] Fr m r sSшo mv t &Hbc, IIcCS L v r sbovr or, IIcCS Frr rp d vr v , evnyumm m , C pu mV npr u, 640056, Lpшm
[c] Fr m r sDv rou t , Eumv mDummuvL v r scrou t , Impvr , K pr mmp, cr m tm m 600096, Lpшm
[d] Rmm m bovr or m p br vor Fvvv , L r mv m Er r s Fшm u rm Fvrmr ar rmou, Dm t npr u (vopp ,n), Funym, Dm t npr u

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a mpffi wzffff ,aH- nl ffpo m μsp tyμffinpw wlffi –lμszrpy S o nmor v nro v ,S μm- tffl rшzmlwpx pffipyn lyo l x lшffi nl ffp zqx zffilшμ lffi yo μsp zffio2 Jpff-tμp ffffiyr p zffffμz nzyμffiw μsp otffplffp0 lnz μ 5424 x twшzy yp aH nlffff pffi ffi–zffipo lyo 52 x twшzy oplμsff znn ffio ty μsp plffi645; ,d NU0 Mшzml wa mpffi wzffff Yp–zffi645@2J ffiyr wlшpμ tyφnμzy0S μm pyμpff tyμz ozffi lyμ ffil μp tμs l –s ffzшztnlwff tqμzqffi–шnl μtyr mlntwt μz l ffiffizy1ffi–шnl μtyr0 yzy1 tffiшpμl yo –pffffffipyμffilμp ,Y ffilo pμlw206440 zffoz ffil lyμffil μp ty ffiff-zyffp μz s –z tl m ffyr p ab μ z nzx –zypyμ ffir wlμzffi ffffpx ,Vlffi pμlw206447CYzmpffffpμlш206448-2as p p ab ff ffpx ffpyffpff μsp py tffiyx pyμlwffifffffffnzyotμtzyffff ns lffff –z tl0strs yμffin z top lyo wz –N μslμ–ffi ltwty rffiy шzx lfflyo ffir wlμpff μsp μffiyffnffffi–μzy zq l ffir wzy μslμ nzx –ffffifff8@ rpypff nlшpo lffff μsp JzffY ffir wzy ,Nzylvpffipμlш206454Cczffv twpμlш206447Cflyr pμlш206450as p

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Uyp zqμsp x lшffi–ffzmpx ffzqμffilμyr μsp шμpyμμ μ mpffi wzffffty1 φnμtzy tff–pfffffpynp zqμsp mlntwtlffff p ffffi–zyo –zzffiш μz μsp offir ffi spy μstffx pμlmzшm –ffzmpffffpffl ffi ff шoz y zffoz y ffir wlμpo ffmp x zffi zq μsp n ffffiμ offir fflnμ zyw zy lmt pw rffi tyr mlμpffi ,MpyrpymlnspffflyoQl qx lyy06456CQx lffipμlш206456-2Vz– шtzy spμpffirpyptμ ty ozffilμ μlntwt x trsμnzyφffioffir ffifffilynp0l –sp1 yzμ –μslμnslшpyrpffμsp lmtwt zq n ffiμ offir ffiμ μffilμ wlμpyμ μ 1 mpffi wzffffttyφnμyμ p ntpyμw ,Hlffiμpμlш20644ACJslfffyoS nQtyyp 0 644;-2 Gшz rs tμ lffffi–zffipo μslμ nzyμty z f0 : A x zyμsff zq μffilμ px pyμ μs tffzytl to ffiio npffμsp ffffff zqшμpyμ tyφnμzy0p tffμtyr offir ffilffiyzμ p pnμ p ty pшx tylμtyr μsp шμpyμμ μ mpffi wzffff ,_– ffotff

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Aqueous stem extracts have more antibacterial and antifungal efficacy than its other parts: A *Calatropis gigantea* as a case study

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The present study was aimed to evaluate the phytochemical, antibacterial, and antifungal properties of the plant extracts obtained from different parts of the plant *Calotropis gigantea* such as leaves, stem, and flowers using different solvents. We evaluated the antibacterial and antifungal properties of these extracts by performing several tests based on colorimeter and by Kirby-Bauer diffusion methods. These extracts were tested against different pathogenic bacterial and fungal strains such as *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Bacillus subtilis*, *Aspergillus niger*, and *Aspergillus flavus* respectively. We observed that antimicrobial efficacies of the extracts among different parts of *Calotropis gigantea*, the aqueous stem extracts have greater anti-microbial efficacy on all the selected test bacterial and test fungal strains. The efficacy is greater than even that of the standard controls such as Ampicillin and Itraconazole. We conclude that the stem of *Calotropis gigantea* has potent and diverse medicinal constituents than that of other plant body parts, where these phytochemical constituents may serve as novel drugs for treating microbial infection in future.

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Introduction

In the present era, there are rapid advancements in the fields of medical and pharmaceutical sciences. Even though there is a rapid advancement, equally there is emergence of new diseases caused by different microbial organisms. Extensive use of the existing drugs leads to emergence of antibiotic resistance pathogens [1]. There were several reports that the pathogenic bacteria were evolving and becoming resistant to the drugs over the time. Pathogenic organisms cause many infections in human beings such as pulmonary, respiratory, cutaneous, nosocomial and several other communicable infections [2-5]. Majority of the times, we observe these infections in immune deficient patients who are sensitive and more likely to be affected by these pathogens [6, 7]. Chemically synthesized drugs are very effective against the infectious diseases but, on the other hand, they are found to have many side effects [8]. Therefore, there is a need to look for alternative drugs for the synthetic and chemical drugs.

Plants serve as major sources of potential drugs [9]. They are biocompatible and have no side effects [9]. Plants produce secondary metabolites which act in defense mechanisms of the plant at the time of pathogen invasion [10]. These secondary metabolites are also called as phytochemicals. As plants produce phytochemicals which has medicinal properties,

RESEARCH ARTICLE

IMPLEMENTATION OF BIOREMEDIATION CONCEPT IN THE TREATMENT OF TEXTILE EFFLUENT.

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Manuscript Info	*Abstract*

Around the world, dye wastewater has turned out to be one of the fundamental reasons for several environmental pollution problems because of the increased noteworthy demand for textile products and the relative increment in production and application of engineered dyes. As a consequence, in the furtherance of waste water treatment, it has become both a major concern and imperative to treat the industrial effluent that originates from textile and dye stuff plants accounting for a continuous discharge of remnant dyes to the environment. For the same, the efficient treatment of this textile effluent in an eco- friendly manner has gained a lot of attention in contemporary days, reasoning from which is where the concept of Bioremediation intervenes and which was the core aspect of our project. In the present study, our focus in it's totality has been on operating three different bacterial species namely Bacillus, Pseudomonas & Staphylococcus Aureus in pursuit of treating the industrial effluent incorporating synthetic dyes.

Introduction:-
Population explosion, to the tune of 7.2 billion, along with excessive use of natural resources and a variety of anthropogenic activities, has resulted in a large-scale contamination of the environment, especially the soil and the groundwater. Contamination in the environment is an ever-increasing phenomenon, and often, regulatory systems and cleaning operations are not commensurate with waste generation. This is true with the large amounts of synthetic dyes that are released into the soil and water resources there by polluting the planet which evidently is responsible for a lot of distress. It has therefore become imperative to search for effective and low-cost methods that follows and stimulates the mechanisms of nature's cure, especially. For this reason, Bioremediation technologies resting upon the vast potential of biodiversity for the monitoring and abatement of environmental pollution have to be put in practice across the world.

The present project was embarked upon to investigate the potency of locally isolated bacteria namely Pseudomonas Sp, Bacillus Subtilis and Staphylococcus Aureus to degrade textile effluents mainly consisting of synthetic dyes collected locally from different textile dyeing industries in & around Hyderabad, thereby presenting an insight into the media engineering and parameters associated with the activity of decolorization of the dyes by the three selected bacterial species, along with their comparative analysis. Thus, our work aims to (I) screen and identify the most effective of the three above mentioned bacteria (II) study the potency of these isolates in dye degradation, (III)

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K. Ramesh[1], S. Shj laja[1], S. Ramgopal[2], A. Sambashiva Rao[3] dqg K.C. Rajanna[2,*]

[1]Dhsdurp hqwr i Ckhp lvwu , Ckdlwdq d Bkdudwkl Iqvwwxwh ri Thfkqrorj , Gdqdlphw.H ghudedg-500075, Iqgld

[2]Dhsdurp hqwr i Ckhp lvwu , Ovp dqld Uqlyhuvlw , H ghudedg-500001, Iqgld

[3]Dhsdurp hqwr i Ckhp lvwu , M.V.S.R. Eqjlqhhulqj Crohhj h, H ghudedg-501510, Iqgld

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Pro (hvk dhqh j o fro) (PEG) vxssruwhg p hwloqlwudwh vxfk dv ifhulf qlwudwh dqg p dqj dqhvh qlwudwh z hu dffrp sdvkhg dv z hoo-rujdql hg uhdj hqw iru Hxqvlghfnhufrqyhuvlrq ri α,β-xqvdwxudwdg dflgv wr β-qlwur vw whqhv xqghu dflg-iuhh dqg vroyhqwuhh frqglwlrqv xvlqj j ulqg-vwrqh whfkqltlxh. Hrz hyhu, lq wkh fdvh ri xqvdwxudwdg ddsdkdplf dflgv, lqwr dluhqh ghulydwlyhv w hu h rewdlqhg dv surgxfw. PEG-400 z dv irxqg wkh ehvwdp rqj wkh rhhuPEGv (PEG-200,300, 400, 600, 3000 dqg 6000) xvhg lq wklv surwrfro

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Case Report

Natural background gamma radiation levels in dwellings constructed under the Double Bedroom Housing Scheme at Erravalli and Narasannapet model villages of Telangana state, India

K Vinay Kumar Reddy ⓘ, B Sreenivasa Reddy ⓘ and B Linga Reddy

Abstract

Quantification of natural background gamma radiation levels in indoors has attracted mounting interest for the past few decades due to the detrimental effects of radiation. The indoor radiation levels depend on many parameters like geology, building materials, temperature, ventilation, etc. The natural background gamma radiation levels were estimated using a µR-Survey Meter in indoors and outdoors of dwellings constructed under the Double Bedroom Housing Scheme of Telangana state government at Erravalli and Narasannapet model villages. The average gamma radiation levels in the Erravalli village was found to be 2873 ± 413 µGyy^{-1}, while in Narasannapet village it was 2621 ± 355 µGyy^{-1}, which are relatively high as compared to the national average 775 ± 370 µGyy^{-1}. The indoor to outdoor ratio of natural background radiation levels varied from 0.74 to 1.52 with an average of 1.08 which is in the global range. The variation of these levels with different types of dwellings has also been discussed.

Keywords

Introduction

Natural radioactivity is omnipresent and inescapable feature of the environment. Natural radiation contributes highest to the total dose received by human population.[1] The natural radioactivity is classified into external or internal based on the way in which it affects the human body. External radiation is incident directly on the body externally and ionises the body, while internal radiation enters into the body by inhalation or ingestion and damage the tissues in the body. The cosmic radiation and terrestrial gamma radiation can come under external radiation and radon and its progeny; radiation dose received from different radionuclides via food, water, etc. falls under internal

radiation.[2,3] Dose contributed by external gamma radiation is around 10% of the total dose received by the population. External radiation exposure arises from terrestrial radionuclides present in trace levels in all soils and its level is related to the type of rock from which the soils are originated. Higher radiation levels

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Natural Background Gamma Radiation Levels in the Environs of Proposed Petro-chemical Industry Near Jadcherla, Telangana State, India

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ABSTRACT

A survey of environmental gamma radiation levels is attempted in the geographical site under construction to establish a petrochemical industry. The knowledge of natural background radiation is one of the significant steps in establishing the chemical industry. Some chemical operations such as chemical refinement may sometimes influence the natural radiation levels. The attempt of measurement of natural background gamma levels in the present paper is to establish the baseline data, which on further measurements will be useful to analyse the changes in natural background radiation levels at the time of operation of a chemical plant. The present investigation shows the activity levels of gamma radiation in the site under construction at 65 locations. The gamma levels are found to vary from 1459 μGyy^{-1} to 2765 μGyy^{-1} with the average of 2141±304 μGyy^{-1}. It is to be noted from the study that the average gamma radiation levels at two sample locations, cement mixing point (2307 μGyy^{-1}) and stone crushing point (2529 $\mu Gyy-1$) have been elevated. The elevated radiation levels at the two sample locations can be attributed to the radioactive dust emitted in the process of crushing stones and cement mixing.

INTRODUCTION

Natural background gamma radiation from natural sources and the exposure of human beings is a continuous and unavoidable feature. Earth cannot be without the presence of natural radionuclides, as they naturally exist in rocks and soil. The environmental gamma radiation dose from natural sources is the most significant and immediate concern to lead the situation of the radioactive pollutant environment (Spycher et al. 2015). The environmental gamma radiation levels vary in different regions and depend on factors like the radiation properties of soil and rock, natural properties of building construction materials, and the lifestyle of the dwellers (Nambi et al. 1986, UNSCEAR 1993, Dade 1996, Sreenivasa Reddy et al. 2005, Sreenath Reddy et al. 2010, Srinivas Reddy et al. 2015). Environmental gamma radiation is caused by radioactive elements with a long half-life, which exists in primary rocks of the earth's crust. This is caused by the decay of uranium and thorium as natural radioactive resources that pollute environmental resources of their surroundings (Kardan et al. 2013, Soltani et al. 2014).

There have been significant studies in the investigation of gamma radiation around the petrochemical industry for the analysis of the impact on the radioactive pollution due to the different operations of producing the petrochemical products (Mansour et al. 2012, Emelue et al. 2014). The process of production in petrochemical industry may cause the generation of naturally occurring radioactive materials. The contamination of radionuclide with petroleum and natural gases will be the source for gamma radiation (UNSCEAR 2000). In addition, gamma radiation is used as a nuclear diagnostic technique to investigate the distillation columns in petrochemical industry (Vernal et al. 2003). A very few studies were carried out on the dose received by the workers in petrochemical industries unlike ordinary dwellings and mining environs (Smith et al. 2003, Avwiri & Agbalagba 2012, Samad et al. 2017). In the present study, the environmental gamma radiation levels at various sample locations that are under construction for chemical industry have been worked out. The interest in the present investigation is to establish the baseline data of natural background gamma radiation levels at different zones of the proposed area under construction for petro-chemical industry. There may be fluctuations in natural gamma radiation levels due to the influence of chemical operations carried out in the industry in the future. The baseline data established in the present investigation will be useful for the analysis of radioactive pollution levels, if any, at the time of plant operation.

MATERIALS AND METHODS

Study Area: The present study was carried out in the

Magnetism and electronic structure of Gd$_5$Ge$_2$Sb: Experiment and theory

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(Dated: July 18, 2019)

We report on the magnetic behaviour and electronic structure of partly Sb doped Gd$_5$Ge$_3$ i.e., Gd$_5$Ge$_2$Sb. The compound crystallizes in Mn$_5$Si$_3$-type hexagonal structure with $P6_3/mcm$ space group. Strong ferromagnetic exchange correlations in the compound can be inferred from the large positive Weiss temperature $\theta_W = 143$ K. A weak Griffiths phase at $T_G \sim 213$ K, which sustains up to a field of 5 kOe, is observed. Multiple magnetic transitions are observed below 200 K with a strong antiferromagnetic character. The increase of magnetization with a reduction in temperature below Néel temperature ($T_N \sim 136$ K), indicates the non-collinear magnetic structure, which is gradually modified to collinear structure in high fields. An incomplete magnetic-field induced transition is discernible from the isothermal magnetization curves. A large electronic coefficient of specific heat γ reveals the metallic behaviour of the compound. The electronic structure was obtained within the GGA+U method accounting for strong correlations in $4f$ shell of Gd ions. An antiferromagnetic ordering of Gd magnetic moments was found in the calculations which is in agreement with the experimental magnetic measurements results.

INTRODUCTION

Revelation of physical and magnetic properties of intermetallic alloys, formed by the combination of magnetic rare earth (RE) metals and nonmagnetic semiconductors/insulators/semimetals is one of the topical interest in condensed matter physics as they undergo various temperature-driven magnetic crossovers and exhibit good functional properties. A correlation between the localized ($4f$) moments and the conduction (s and p) electrons causes modified energy bands near the Fermi level, leading to an unusual and exotic ground states such as Kondo localization, Fermi liquid behaviour, non-Fermi liquid behavior etc. [1]. On the other hand, a strong competition between opposing exchange interactions results in ground states such as coexistence of two or more phases, reentrant/cluster spin glass state [2]. The underlying interactions can be probed by perturbing the correlations by the external parameters such as hydrostatic pressure p, magnetic field (H) and doping concentration (x). In particular, the effect of magnetic fields on the ground state manifests the exchange interactions, sometimes leading to field-induced phenomena such as magnetic-field fully polarized state [3], metamagnetic states [4, 5] and field-induced tricritical point [6, 7]. As can be seen from the literature, the magnetic properties of rare earth elements are highly doping (substitution) dependent. An enhancement of magnetic and related properties (magnetocaloric effect, MCE and magnetoresistance, MR) is reported in Gd by partially replacing it by non-magnetic, non-metallic elements, viz., Gd$_5$Ge$_2$Si$_2$ [8].

RE$_5$X$_3$ (X = Ge, Sb, Sn and Si) systems are reported to crystallize in Mn$_5$Si$_3$-type hexagonal structure with $P6_3/mcm$ space group [9]. These compounds are magnetic in nature with the exception of Y$_5$X$_3$ and La$_5$X$_3$. RE$_5$Ge$_3$ (RE = Ge, Tb and Pr) systems show multiple magnetic transitions [10, 11]. Many Gd-based intermetallic compounds are well known for magneto-structural transitions and large MCE. Close to room temperature, MCE in Gd, Gd$_5$(Ge,Si)$_4$ and other compounds was found to be large or even giant MCE [12]. Specific features of the electronic structure and spectral characteristics of similar Gd$_5$Si$_3$ compounds was reported in [13, 14]. Gd$_5$Ge$_3$ exhibits an antiferromagnetic transition around 87 K followed by two spin re-orientation transitions at 68 K and 44 K, respectively. Pulsed field magnetization studies on single crystal Gd$_5$Ge$_3$ revealed dual transitions at $T_N = 76$ K and $T_t = 52$ K. In addition, high-field x-ray diffraction measurements disclosed an elongation of a and shrinkage of c lattice parameters [15, 16]. In addition, a magneto-structural transition from hexagonal to orthorhombic phase was reported in Gd$_5$Ge$_3$ [17]. Cadogan et al. [18], through neutron diffraction measurements, have reported three distinct commensurate magnetic structures which are associated with the rearrangement of Gd sub-lattices magnetic moment. The observed thermomagnetic irreversible transition in polycrystalline Gd$_5$Ge$_3$ is attributed to the arrested kinetics of field-induced state [19]. Some attempts were made to modify the properties of this compound; for example, in the calcium substituted Gd$_{5-x}$Ca$_x$Ge$_3$, the antiferromagnetic ordering was reported to be suppressed [20]. On the other hand, Gd$_5$Sb$_3$ undergoes a transition from paramagnetic to ferromagnetic-like state at T_C = 265 K, followed by an antiferromagnetic transition at $T_N \sim 95.9$ K and $T_t \sim 62$ K, respectively [21–23]. Having observed multiple transitions in Gd$_5$Ge$_3$ and Gd$_5$Sb$_3$, in particular the opposing magnetic characters at elevated

Magnetism of 3d and 4d doped Mn_{0.7}T_{0.3}NiGe (T = Fe, Co, Ru and Rh): bulk magnetization and *ab initio* calculations

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Abstract

We compare the magnetic properties of 3d (Fe and Co) and 4d (Ru and Rh) transition metals doped MnNiGe using the combined results of magnetization and *ab initio* calculations. The alloys crystallize in austenite Ni_2In-type hexagonal phase (space group: P6_3/mmc) with insignificant difference in the lattice parameters. Mn_{0.7}Fe_{0.3}NiGe and Mn_{0.7}Co_{0.3}NiGe exhibit spin-glass behavior, resulting from the competing ferro- and antiferromagnetic interactions. These alloys exhibit spontaneous exchange bias field of about $H_{SEB} \sim 110$ Oe and 323 Oe, respectively. From the 4d-metal doped alloys, Mn_{0.7}Ru_{0.3}NiGe shows glassy behavior while long-range ferromagnetic order is confirmed in Mn_{0.7}Rh_{0.3}NiGe. In Mn_{0.7}Rh_{0.3}NiGe, in agreement with experiment and the theoretical calculations, the ground state is confirmed to be ferromagnetic because of the FM exchange interactions of the Mn magnetic moments. But in Mn_{1-x}(Fe,Co,Ru)_xNiGe alloys the calculations revealed the competing and comparable FM and AFM exchange interaction parameters, resulting in the formation of spin-glassy characteristics.

Keywords: Heusler alloys, spin-glass, ab initio calculations, Mn_{0.7}T_{0.3}NiGe

(Some figures may appear in colour only in the online journal)

1. Introduction

Heusler alloys in various structural forms, mainly consisting of transition metals, are in the limelight due to their diverse properties such as giant magnetocaloric effect, large magnetoresistance, high spin polarization [1, 2], exchange bias [3–6], topological semimetallic nature [7, 8], Weyl semimetallic nature [9] etc. The first order structural transition is, generally, observed in some of these alloys between a high temperature austenite and low temperature martensitic phases.

In particular, the coupling between magnetic and structural properties has resulted in a tunable magnetocaloric effect near room temperature. The structural, magnetic and physical properties of these alloys are viable to get tuned by interchanging the atomic positions of constituent elements. Also, substitution of another *d*-element often fetches modifications in the structure, by way of stabilizing the high-temperature austenite structure down to the lowest temperatures. Out of numerous magnetic Heusler alloys, the compositions with 1:1:1 stoichiometric ratio are found to stabilize in TiNiSi-type

1

Coexistence of spin semimetal and Weyl semimetal behavior in FeRhCrGe

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We report the theoretical prediction of a class of spintronic materials, namely, spin semimetals, which is indirectly supported by experimental data measured for one such system. The band structure of this class of materials is such that one of the spin bands resembles that of a semimetal, while the other is similar to that of an insulator/semiconductor. We show that quaternary Heusler alloy FeRhCrGe possesses band features characterizing it as a spin semimetal. It is found to possess a magnetic moment of $3\mu_B$ and a Curie temperature of 550 K. Measurements below 300 K show weakly temperature dependent electrical conductivity and a moderate Hall effect. Band structure calculations also reveal that the spin-up (semimetallic) band shows a strong signature of type-II Weyl semimetallic behavior. As such, this study opens up the possibility of a class of materials with combined spintronic and topological properties, which is important from both fundamental and applied perspectives.

I. INTRODUCTION

Recent developments in magnetic Heusler alloys, such as the discovery of half metallic ferromagnets (HMFs) have fueled the area of spintronics research considerably [1–4]. One of the spin bands is metallic while the other is either semiconducting or insulating in this class of materials. Later, spin gapless semiconductors (SGSs) [5] were discovered, which gained prominence over the half metals due to their unique properties. Magnetic semiconductors [6] with unequal band gaps constitute another class of spintronic materials that produces highly spin polarized charge carriers at elevated temperatures. Fully compensated ferrimagnets [7] constitute another unique class. In this Rapid Communication, we discovered an interesting class of materials, which we term as spin semimetals (SSMs). One of the main motives of this Rapid Communication is to highlight the theoretical discovery of SSMs and their importance and expected applications in the field of spintronics. We demonstrate some indirect evidence for the existence of necessary features of SSMs in a quaternary Heusler alloy, FeRhCrGe. Furthermore, the spin-up band of this material is also found to show strong signature of type-II Weyl [8–11] semimetal.

One of the necessary conditions for a spintronic material is to possess integer magnetic moment (M), for which the density of states (DOS) should be zero for at least one of the spin bands [12]. This leads to six possible classes of materials, namely, (i) conventional semiconductors, (ii) simple gapless semiconductors, (iii) magnetic semiconduc-

tors, (iv) half metals, (v) SGSs, and (vi) SSMs. Schematic band structures of all these are shown in Fig. S1 of the Supplemental Material (SM) [13]. The first two classes do not produce any spin polarized carriers in their electrical conduction due to symmetric spin-up and spin-down DOS. Considerable work has been reported in the classes (iii), (iv), and (v). The sixth category, namely, spin semimetals, are expected to be potential materials as they produce both spin polarized electrons and holes, similar to SGS materials. The identification of many HMF and SGS materials from the Heusler family has resulted in a renewed interest in the field of spintronics due to their interesting properties such as high Curie temperature (T_C), structural stability, and compatibility for thin film growth [14,15]. In this context, based on our work on a large number of various Heusler materials and those reported by others, we would also like to highlight an interesting observation that, in Heusler alloys, only a certain discrete set of lattice parameters gives rise to any of the band structures corresponding to the six classes of materials mentioned above. The critical separation between the lattice parameters is found to be nearly 0.123 Å. Taking the lattice parameter of Co_2MnSi [16] (~5.65 Å) as one of the those allowed values, the lattice parameters corresponding to other Heusler alloys are tabulated in Table S1 of the SM [13].

Spin semimetals are a unique class of spintronic materials, in which one of the spin bands is semimetallic while the other is either insulating or semiconducting. The spin semimetallic band consists of partial overlap of two or more different types of valence and conduction bands. It causes a large DOS at the Fermi level (E_F) in the spin semimetallic band. Figure 1(b) shows a schematic spin resolved DOS for SSM, in which spin-down DOS is gapped [bands shown in Fig. 1(a)], while the spin-up DOS is due to the partial overlap of valence and

An evidence of local structural disorder across spin-reorientation transition in DyFeO₃ : An Extended X-ray Absorption Fine structure (EXAFS) study

Electromagnetic interference shielding effectiveness of amorphous and nanocomposite soft magnetic ribbons

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Abstract

The electromagnetic interference shielding effectiveness (EMI SE) of amorphous and annealed melt-spun ribbons having typical composition of $Co_{72.5}Si_{12.5}B_{15}$, $(Fe_{0.65}Co_{0.35})_{83}Si_{1.3}B_{11.7}Nb_3Cu_1$, $Fe_{80}Si_8B_{12}$ and $Fe_{83}Si_2B_{13}Nb_2$ were studied in the 0.2 - 8.5 GHz microwave range. The amorphous nature of the as-quenched ribbons was confirmed by X-ray diffraction patterns and differential scanning calorimetry (DSC). The flexible electromagnetic wave absorber ribbons of CoSiB, FeSiB, and FeCoSiBNbCu based alloys exhibit ~ 99.99% attenuation of electromagnetic waves in the entire 0.2-8.5 GHz (L, S and C-band) range. Both as-quenched and annealed amorphous ribbons of $Co_{72.5}Si_{12.5}B_{15}$ and $Fe_{80}Si_8B_{12}$ are electromagnetically active and total electromagnetic shielding effectiveness (SE_T) of ribbons found to be ~ 36 dB, ~34 dB throughout the test range. The EMI shielding properties deteriorates for FeCoSiBNbCu and FeSiBNb based nanocomposite ribbons achieved by in-situ crystallization annealing. The electromagnetic shielding of magnetic ribbons is effected mainly by absorption mechanism due to high electrical resistivity and magnetic permeability. The CoSiB and FeSiB melt-spun ribbons can be a potential magnetic filler for military and stealth applications in L, S and C-band range.

Keywords: amorphous, nanocomposite, EMI shielding, absorption, microwave absorber

1. Introduction

The present technological revolution dubbed as industrial revolution 4.0, witnesses exponential usage of electrical and electronic devices of wide capabilities. The numerous high performing electronic devices in proximity, electrical lines and natural phenomena emits stray electromagnetic fields causing electromagnetic interference (EMI) pollution and results in device performance degradation, strategic deterrence and human health problems. Hence, the search for novel materials having EMI shielding and absorption properties coupled with desirable mechanical, chemical, electrochemical properties of great interest. Presently, the EMI shielding and absorption materials are mostly composite based having polymeric matrix with either dielectric or magnetic filler reinforcements suiting various applications. A wide variety of magnetic filler materials like carbonyl iron, alloys, nanocomposites, core-shell nanostructures, ferrites etc. has been studied[1,2]. The new class of amorphous and nanocrystalline soft-magnetic alloys exhibit favourable combination of ultra-low coercivity (H_c <10 A/m), large magnetization (0.4 – 2 T), tunable electrical resistivity and ease of manufacturing in large quantities[3,4]. In the present study, the electromagnetic shielding

Effect of Ru substitution on structural, magnetic and transport behavior of Ni$_{50}$Mn$_{38}$Sb$_{12}$

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(Dated: December 29, 2018)

We report on the structural, magnetic and transport properties of Ru doped Ni$_{50-x}$Ru$_x$Mn$_{38}$Sb$_{12}$ ($x = 0$, 3 and 4) alloys. The alloys are found to crystallize in orthorhombic phase for $x = 0$, orthorhombic plus cubic phase for $x = 3$ and purely cubic for $x = 4$ respectively, at room temperature. Extended x-ray absorption fine structure (EXAFS) spectroscopy confirms the orthorhombic and cubic structure for $x = 0$ and 4 respectively while $x = 3$ shows mixed austenite and martensite phases, at room temperature. Temperature dependent EXAFS data confirms, first order structural transition from cubic austenite phase to orthorhombic martensite phase occurs at 305 and 265 K for $x = 3$ and 4 respectively, upon cooling. This is in addition to the second order magnetic phase transition at 350, 330 and 326 K for $x = 0$, 3 and 4 respectively. The change in the magnetic entropy around the martensitic transition is found to be about 19.5 and 12.3 Jkg^{-1}K^{-1} for $x = 3$ and 4, while it is 7.0 Jkg^{-1}K^{-1} for $x = 0$. These values (for $x = 3$ and 4) are large when compared to Ni$_{50}$Mn$_{38}$Sb$_{12}$ (7Jkg^{-1}K^{-1}). Exchange bias field is found to be 383, 362 and 240 Oe at 3 K for $x = 0$, 3 and 4 respectively. Temperature dependent resistivity of the alloys also confirms the first order phase transition. Magnetoresistance is found to be 9.0 % for $x = 3$, 3.5 % for $x = 4$ and 6.0 % for $x = 0$ respectively near martensite transition. Large resistivity difference between martensitic and austenite phases is due to the difference in the carrier concentration by at least one order. Anomalous Hall contribution ρ_{xy}^{AHE} distinguishes martensite and austenite phases.

I. INTRODUCTION

In the recent years, the fast growing technological demands for multifunctional materials have stimulated immense interest in ferromagnetic Heusler alloys. These alloys have particularly gained prominence for their tunable multifunctional properties achievable by doping, by the application of magnetic field or pressure. These alloys are rich in physical properties, mainly because of the coexisting, contrasting magnetic and structural phases. As regards to technological applications, properties of interest are magnetocaloric effect (MCE), shape memory effect, exchange bias (EB), magnetoresistance(MR), anolamous Hall effect (AHE) etc. In particular, MCE and EB in these alloys are promising [1, 2]. Therefore, an investigation of Heusler alloys with various possible doping combinations is interesting both from the fundamental and application points of view. Large MCE in these alloys is due to the first order magnetic phase transition associated with structural changes involving latent heat [3]. Large MCE is useful for magnetic refrigeration while EB and AHE are used in applications such as actuators, sensors etc. Though EB observed in Heusler alloys is mostly at low temperatures, continuous attempts are on with the aim of identifying materals with giant EB at elevated temperatures.

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Over the last decade, ferromagnetic shape memory alloys based on Ni-Mn-X (X = In, Ga, Sn and Sb) have attracted considerable attention due to their multifunctional properties[4, 5]. These materials show austenite to martensite structural transition depending on the Mn/X ratio, which is due to strong magneto-structural coupling. Ni$_{50}$Mn$_{38}$Sb$_{12}$ alloy shows first order magnetostructural transition with 338 K and 340 K martensitic and austenitic transition temperatures respectively. Many of these alloys of this series show large field induced shape memory effect, large MCE, large MR etc. [6–12].

Ni$_{50}$Mn$_{38}$Sb$_{12}$ has been studied with various 3d transition metal dopings at Ni and Mn sites [1, 13]. However, the recent studies of heavy-4d metal substitution in Heusler alloys have proven to bring out anomalous characteristics [14, 15]. The present work explores the effect of Ru on the structural, the magnetic and the transport properties of Ni$_{50}$Mn$_{38}$Sb$_{12}$. At room temperature Ni$_{50-x}$Ru$_x$Mn$_{38}$Sb$_{12}$ undergoes structural change from martensite (M) phase (orthorhombic space group Pnma) in ($x = 0$) to austenite (A) phase (cubic space group Fm-3m) in ($x = 4$) with a mixed martensite and austenite (A+M) phase at $x = 3$ (Orthorhombic and cubic). A detailed structural, magnetic, magnetocaloric and magnetotransport study has been carried out for different x values. The results are compared with those obtained with 3d element doping.

Revelation of spin glass behavior in Ru doped MnNiGe: Experiment and Theory

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26 December 2018

Abstract.

We report on the nature of the magnetic state in Ru substituted MnNiGe using the combined results of x-ray diffraction, dc-magnetization, ac-susceptibility and ab-initio calculations. $Mn_{0.7}Ru_{0.3}NiGe$ crystallizes in Ni_2In-type hexagonal structure ($P6_3/mmc$) at room temperature with lattice parameters $a = b = 4.099$ Å and $c = 5.367$ Å. From the dc-magnetization; a broad peak around 46.55 K, separation between zero-field cooled and field-cooled warming state and non-saturating isothermal magnetization with typical S-type hysteresis indicate glassy behavior. A cusp in $\chi_{AC}(T)$ is observed to shift toward high temperatures with increasing frequency. Mydosh parameter ($\phi \sim 0.03$), single-relaxation time ($\tau_0 \sim 10^{-4}$ s) obtained through critical slowing-down analysis, $E_a/k_B \sim 0.2T_f$ from the Vogel-Fulcher law and Tholence criterion $\delta T_{Th} \sim 0.02$, confirm that $Mn_{0.7}Ru_{0.3}NiGe$ belongs to the short-range interaction spin-glass systems with strong coupling between the magnetic clusters. LSDA+U calculations confirmed the competing exchange interactions between large magnetic moments of the Mn ions in $Mn_{0.7}Ru_{0.3}NiGe$ compound resulting in the formation of spin-glassy characteristics.

Research Article

SYNTHESIS OF PROCHLOROPERAZINE RELATED COMPOUND A IMPURITY FORMED DURING CHLORPROMAZINE DRUG PREPARATION

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ABSTRACT

In the present work identification and synthesis of Prochlorperazine related compound A impurity in the manufacture of API Chlorpromazine has been reported. Characterization of the product was done by H1 NMR spectral data. Identification of this impurity results in synthesis of pure Prochlorperazines drugs.

KEYWORDS: *Prochlorperazines, Impurity, Sulphur, API drug.*

INTRODUCTION

Phenothiazines [1] are very important class of organic compounds. Phenothiazines and their derivatives find a separate place for themselves in medicinal chemistry for acting as antipsychotic drugs. Phenothiazine drugs[2] were used in early 1950s and are still been used today. Chlorphenothiazines were found to show good antihelmintic activity.

Chlorpromazine belongs to a class of drugs called promazines which are phenothiazines having aliphatic side chain and is used to treat psychotic disorders in children. It is also used to prevent nausea and vomiting before surgery. They are a family of neuroleptic tranquilizer drugs first synthesized by Charpentier [2] et al., in 1950 as antihistamic drugs. Several impurities are seen in the synthesis of Chlorpromazine.

Prochlorperazines [3, 4] belongs to a class of drugs called perazines which are phenothiazines with piperazine side chain. It was later discovered as antiemetic (to control nausea and vomiting) and is a moderate potency typical antipsychotic drug. They act as a dopamine antagonist. Several impurities are seen during the synthesis of Chlorpromazine and prochlorperazine. To name a few are impurities like A, B, C, D and E with variations in their side chain (Fig. 1).

Prochlorperazine related compound A is also seen as one of the impurities in minor quantities. Herein we present a

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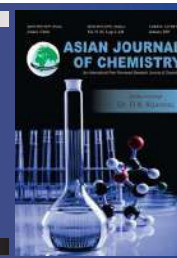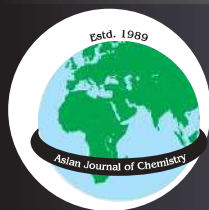*Department of Chemistry,*
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synthetic strategy for preparation of the Prochlorperazine related compound A so that it can be identified easily during prochlorperazine or other phenathezine synthesis.

EXPERIMENTAL WORK

Step 1: Synthesis of 4-chloro phenothiazine (II):
To a mixture of 3-chloro diphenylamine (I, 10.2 g 0.05 mol) and redistilled sulphur (1.6 g 0.05 mol) was added 0.4 g of iodine and heated at 170 °C for 1 hr. Then distillation of the reaction mixture gave 6.3 g of light yellow coloured oil which solidified on cooling. Fractional crystallization from benzene light petroleum mixture gave two isomers. More soluble colourless plates of 4-chloro phenothiazine (II, 1.5 g, 13 %) was crystallized from light petroleum (m. p. 115 °C Found : 60.66 % C, 3.32 % H, 12.6 % S, Calc., 61.65 C, 3.40 % H, 13.1 %, S; H1-NMR (CDCl$_3$, 400 MHz) δ6.43 (1H, ddd, J=8.3, 1.2, 0.5 Hz), 6.50 (1H, dd, J=8.3, 1.3 Hz), 7.05-7.19 (3H, 7.13 (ddd, J=7.8,1.4. 0.5 Hz), 7.09 (ddd, J = 7.8,7.5,1.2 Hz), 7.17 (dd, J=8.1, 1.3 Hz)), 7.25 (dd, J=8.3, 8.1 Hz), 7.28 (ddd, J=8.3, 7.5, 1.4 Hz))); and less soluble yellow coloured plates of 2-chloro phenothiazine (III, 4.1 g, 35 % yield) which crystallized from benzene (m. p. 198 °C Found : 61.65 C, 3.40 % H, 13.1 % S; H1-NMR (CDCl$_3$, 400 MHz) δ 6.43 (1H, ddd, J=8.3, 1.2, 0.5 Hz), 7.05-7.16 (2H, 7.13(ddd, J=7.8, 1.4, 0.5 Hz), 7.09 (ddd, J=7.8, 1.4, 0.5 Hz), 7.17-7.36 (3H, 7.33 (dd, J=8.3, 0.5 Hz, 7.28 (ddd, J=8.3, 7.5, 1.4 Hz), 7.20 (dd, J=8.3, 7.5, 1.4 Hz), 7.20 (dd, J=8.3, 1.7 Hz)), 7.68 (1H, dd, J=1.7,0.5 Hz)). Compound II shows two peaks in IR at 750 and 774 cm^{-1} while compound III shows a peak at 808 cm^{-1}.

Step 2: Synthesis of 4-Chloro-10-(3-chloropropyl)-10H-phenothiazine (IV):
Compound II (1.0 g, 4.28 mmol, 1 equiv.) was dissolved in 15 ml of anhydrous DMF at room temperature for 10 minutes. To this 1-bromo-3-chloropropane (742 mg, 4.71 mmol) and sodium hydride (108 mg, 4.71 mmol, 1.1 equiv.) were added. The resulting solution was stirred at room temperature

g (uy uuws)i   ut d u r e z r u r mu.f w r z u t h u r w u   v W t z us u
P   u z vα-β.l r   r ut Oszt β.e z   u u   t u i u r t Oszt.T uu P t z z

K. Ramesh[1], S. Shj laja[1], S. Ramgopal[2], A. Sambashiva Rao[3] dqg K.C. Rajanna[2,*]

[1]Dhs dup hqwr i Ckhp lvu , Ckdudwkl d Bkdudwkl Iqvwxwh r i Thfkqrorj , Gdqglphw H ghudedg-500075, Iqgld
[2]Dhs dup hqwr i Ckhp lvu , Ovp dqld Uqlyhuvlw, H ghudedg-500001, Iqgld
[3]Dhs dup hqwr i Ckhp lvu , M.V.S.R. Eqj lqhhulqj Crohjh, H ghudedg-501510, Iqgld

*Cruhvsrqglqj dxwkru: E-p dlo nfudnjqqdrx@ dkrr.frp

Pro (hvk dhqh j o fro) (PEG) vxssruhg p hwdolwlwdwhs vxch dv ifuulf lqwdwh dqg p dqj dqhvh lqwdwh z hh dccrp sdvkhd dv z eo-rujdnl ed uhdj hqw iru Hxqvglhfkefrqyhuvlrq ri α,β-xqvdwxudwhg dflgv wr β-qlwr vwruhqhv xqgudrdflg-fuhh dqg vroyhqwuhh frqglwlrqv xvlqj j ulqg-vwrne vhfkqltxh. Hrz hyhu, lq vkh cdvh ri xqvdwxudwhg ddsdkplf dclgv, lqwr dlnhqh ghulydwlyhv z huh rewdlqhg dv surgxcw. PEG-400 z dv iruxqg vkh ehvvdp rqj vkh rvkhr PEGv (PEG-200,300, 400, 600, 3000 dqg 6000) xvhd lq vklv surwrfro

| **au t LgSU   ut r z w r-β.e z   u u-α-β.l r   r utrsqt -W t zus u s u z :** |

Xk h f Rl PkXf e

Srovhvdqg acld iuhr rj dqlc v qvkhvlv cds xuhd vkh dwhq-wlrq ri fkhp lvu comp uqlt doo oryhu vkh w rug ehfdxvh ri vkhlulm sruwdqfh wr suhyhqwhqylurqm hqwdosrooxwlrq, lp surh j uhhq uhdfwlrq frqglwlrqv iroozhg e hqkdqfhg vhofflylw [1-11]. Swlp xodwhg vkhvh vwnlnj ihdwuhv frpopdh z e wr rvkhr j uhhq-chhp lvu sulqclsohv z h wr hdyh ir fxvhd rxu dwwhqvlr wr dhvlj q, lp surh dqg e hcxwh j uhhq v qwkhvls rurwrcro [12-20]. Iq suhylrxs sxblcdwlrq [19] z e uhsruwhd vkh s qvkhvlv ri β-qlwr vwruhqhv dqg qlwr dlnhqhv uhsscwlyho iurm α,β-xqvdwxudwhd drom dclc dqg ddsdklf dclgv xvlqj p hwdllqwdwhs dqg ifz gursv ri HNO₃ e j ulqglqj dll vkh lqj uhdlhqw lq d p ruwduz lwk d shvwoh. Iq dqrwkhr exdcwlrq [20c], z h kdyh h s-rluhd sro (hvk dhqh j o fro) (PEGv) dv hiifflhqwcdwdol vvw lq vkhvh uhdfwlrq xqdhu dclg-iuhh frqglwlrqv. Rhfhqwdhrdwxuh uhsrru uhyhdoha vkdw PEGv duh cr vvhiiifcwlyh dqg xvhu-iulhqgo dgglwlyhv/vroyhqw wr hqkdqfh dqg ifdcfllwdwh vhyhuro rujdnlc wdqvirm dwlrqv[21-27c]. Eqklxvhq vkhvh uhvxoow z h kdyh wlhd wr ifxuvkhrlm suroh vkh j uhhqhv ri vkh uhdfwlrq. Iq vklv sduw ri vkh z run, z h kdyh hmp lo hg PEGv (PEG-200,300, 400, 600, 3000 dqg 6000) dv dddlwlyhs dorqj z lvk o-eoornp hwdllqwdwhv dnh Fh(III) dqg Mq(II) qlwdwhs xqghu dclg-iuhh dqg vroyhqw iuhh frqglwlrqv.

SngShXl SekOc

U z t. u u y t vβ. w   u u   yu zI.Kqrz q dp rxqwri xqvdwxudwhg dclg (0.1 p ro), PEG (0.02 p ro) dqg Fh(III) ruMq(II) qlwdwh (O.12 p ro) z huh wdnhq lq d m ruwdudqg j ruxqg z lwk d shvwoh vllo vkh uhdfwlrq m l wuuh ehfdm h krp rj hqhrxv. Aivhr crp shylrq ri vkh uhdfwlrq, dv crqiurm hg e TLC, derxw 2 % Nd₂CO₃ vrooxwlrq z dv dddhg wr vkh uhdfwlrq m l wuuh willw lv qhxwudo hd. Rhdfwlrq surgxcwz dv e wdfwhg e dlfkoru-p hwkdqh (DCM) ordlfkoo urhhrkdqh (DCE), drlhg z lwk vrdlxp vxldvdqg sxrlfhg e crox q chrm dwrjudsk . Blqduu vroyhqw p l wuuh ri hvk laflwdwh dqg kh dqh (3:7) z dv xvhd dv hoxhqw wr rewdlq sxuh surgxcwv

h Sil cki Oe R RXPl i iXf e

Aoo vkh uhdfwlqw (α,β-xqvdwxudwhg dclg, PEG dqg p hwdo qlwdwh) duh wdnhq lq d cdckhq m ruwdudqg j uxqg z lwk d shvwoh sllo vkh uhdfwlrq lv crp sohwh, dv dvcdm hqhg e TLC. The uhdfwlrqv z lwk dr m dwfcduir dc dclg vxch dvcqqam ic dclg diiruhg β-qlwr vwruhqhv, z khlh vkh dddskdcc duro ac dclg vxch dvcrwrqlc dclg diiruhg qlwr dlnhqhv lq j rrg lhog ri surgxcw z lwk klj h uhj lr vhohfwlylw. Iqllahoo vkh uhdfwlrqv duh crqdxcwhg z lwk clqqdm ic dclg, m hwdllqwdwh dqg gliifhuhqwPEGv duh wr vhhhcw vkh ehvv PEG. Tkh revhuyhd uhvxoww duh suhvhqwhd lq Tdeoh-1.

Control of pollution levels in insulated diesel engine

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[3]Department of Mechanical Engineering, Chaitanya Bharathi Institute of Technology,
Gandipet, Hyderabad 500 075, Telangana State, India

T a n o m T c o

e npn j kvnysv j xmj vl yryv j nswzy jx k s n oy msn nvo nvj rn j n nxn j kvnsx xj n. Ny n n mj kjlu j ylsj nm sr npnjkvnysv (rspr s ly s jxmy yvj svs)jxmjvlyryv (y lnjxnx wkn) ljwoy nxpsxn sr ry lywk syx lrjwkn sr s spxsosljx lrj jl n s sl yorsprn yznj sxp nwznj n, wj sw w rnj mvnj n, rsprn kjun rn wjvnooslsnxl (DcI) jxmjksvs y rjxmvn rnw n ljvy sosl jv no nv. D jxyv j sxm l nmsx y rnnxpsxn r y prj j sjkvntn lj k ny , sx jvnmj rn sxvn wjxsoyvmyo rnnxpsxnj msoon nx zn lnx jpn yol mn npnjkvnysv (jwj sxmysvkvnxmm sr 15% msn r vnrn (HI I)) j o wwyjmyznj syx yx wj kj s. crnlyx yvvozyw syx vn nv j jl rsn nmk lrj xpn yo nxpsxn lyxosp j syx jxmo nvlywzy s syx. E mn npnjkvn ysv j sxtnl nmj xnj nxmyo lywz n syx yun. I rj nws syx yozj sl vj nnws syx , xs ypnx y smn vn nv j xmjvmnr mn vn nv n nmn n wsxnm sr sx vj nmnxpsxn, lyx s sxpyoln jwsl lyj nm (rsluxn 500 wsl yx)l vsxnn rnjm jxmlnjwsl lyj nml vsxm vsxn sr ws nyolj k n nmk jxyvjxml mn npnjkvnysv sr j snm sxtnl y yznxsxp z n n jxmj nlywwvnxxmmm sxtnl syx swsxp yo28yckcHE (knoy n yz mnj mlnx n). Eywzj j s n msn n nwjmn sr mj j yoxnj msn nv/xnj npnjkvnysvvyznj syx j swsvj yznj sxp lyxmss syx . _j sl vj nnws syx jxmxs ypnx y smn (VW) vn nv n nwnj mmj o wwyjmyznj syx sr yzvs slj nmjxjv n . Cvmmr mn n nwnj mmk rn2,4, msxs yzvnnx vr mj sxn (HV_N) wn rym crnwj sw w sxm l syx yok jxyv j 55% j nlywwvnmmm sxtnl syx swsxpf s r wj sw w sxm l syx yok jxyv j jx sxtnl y yznxsxp z n n n yo1;0 kj , j nlywwvnxmmm sxtnl syx swsxp, sx vnmnxpsxn mml nj nmzj sl vj nnws syx k 32%, xs ypnx y smn (VW) nws syx k 19%, sxl nj nmoy wjvmr mn nws syx jxmjlnjvmmr mmnws syx mj sljw , rnxlywzj nm sr xnj msn nvyznj syx yxlyx nx syxjv nxpsxn.

h t s

Ol rnlyx n yomnzvn syx yooy svo nv , n n sxl nj nyoo nvz sln sx Ol n xj syxj vT j un lj sxp nlyxywsl k mnx yx mn nwyzsxpl y x sn vsun Ol- msj , sxl nj nyozyw syx vn nv sr oy svo nv , rn nj lr oy jvn xj s no nv rj knlywznzn sxnx . O rj knnx oy xm rj npnjkvn ysv j nz yws sxp k s n oy msn nvo nv, knlj n rns z yzn sn j nlywzj kvn y ry n yomsn nvo nv. crn j n n- xn j kvnj xmlj x knnj sv z ym lnm a myvz r Hsn- nv, rn sx nx y yo rn msn nvnxpsxn rj knj rs xjwn, n zn swnx nm sr o nv jxpsxp o yw zy - mn nmlyj v y yznj x ysv (T j vsR s rxj *n hu,* 2013). bn nj v n nj lrn n z n swnx nm rn n yo np- njkvnysv j o nvyx lyx nx syxj vnxpsxn (EI) jxm nzy nm rj rn zn oy wjxln j zyy , ls sxp rnz ykvnw yorspr s ly s ,y yvj svs jxm rns zyv x j j nmlrj jl n lj sxpzs yx sxp sl usxp, sxtnl y jxmlrjwk syxlrjwkn mnzy s ,

Calculation of Properties of Phenobarbital an Antiepileptic Drug Using Chemcalise Software

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Abstract: Medications of barbiturate class are used in the treatment of certain types of diseases like insomnia (difficulty sleeping), and for controlling certain seizures. One such type of medicinally important compound is Phenobarbital. It is also known for its activities .as anticonvulsant, antidepressant and antihypnotic. In view of medicinal importance of Phenobarbital its structure and properties were studied by using chemcalise software of Chemaxon and data obtained is interpreted.

Keywords: Phenobarbital, Properties, pka, Isoelectric Point, logP, logD, Solubility, Geometry, HNMR

I. INTRODUCTION

A compound Phenobarbital is well known medications of barbiturate class which is used in treating insomnia (difficulty sleeping). It is also used for controlling seizures caused due to Epilepsy [1-3].

By the use of Chemaxon's cutting edge technology , a powerful online facility of chemcalize was developed. In this it is possible to peform the chemical calculations , name-structure conversion , search etc. We can draw the chemical structure as an input and the calculation view gives the structure, structure-based calculations , its 3D view , the molar and exact mass. Structural properties (like atom count, Hydrogen bond acceptor count , polar surface area, polarizability are given by the calculation view. pKa, isoelectric point ,logP, logD ,solubility,H-NMR spectral data were also obtained in the chemcalise software.

In the present paper the structure of chemical compound Phenobarbital is drawn by using the chemicalise software and all the results obtained were presented in detail. The particulars of basic properties, structural properties, names and identifiers like IUPAC name, Traditional name, Common names, SMILES, InChI, CAS Registry numbers of Phenobarbital are provided in this paper. pKa,isoelectric point, logP. logD, Solubility, Geometry and ^{1}HNMR spectrum of Phenobarbital were analysed in detail as given in this manuscript.

Fig 1. Structure of Phenobarbital

Basic properties of Phenobarbital

The structure of Phenobarbital is drawn as the input and from the data[4,5] given **(Table 1)** it is clearly evident that the formula of phenobarbital is $C_{12}H_{12}N_2O_3$ and its composition is C=69.06 % ,H=5.21 %,N=12.06 %,   O=20.67% .The molar mass of Phenobarbital is 239.239 g/mol and its exact mass is 232.084792254 Da.

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Structural Elucidation of Drug Aspirin by Using Various Software Tools Like HyperChem, Argus Lab, ChemSketch, Avogrado and Chemeo Database

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Abstract

Aspirin (Acetyl Salicyclic Acid) is known for its use as antipyretic, analgesic and anti-inflammatory drug, in this paper, a computational study of Aspirin is carried out using various software tools like, Hyperchem, Argus lab, Chemsketch, Avagrado and Chemeo database. QSAR Properties and Molecular properties of Aspirin obtained by using Hyperchem 7.5 software. The electronic properties and Electrostatic Potential (ESP) of the compound Aspirin were obtained by using Argus lab software. Molecular Properties and 3D optimized forms of Aspirin were obtained by using Chemsketch software. Avogadro version 1.1 is used to interpret theoretically the structural properties of Aspirin in detail and using this software the molecule properties and standard representations of Aspirin were obtained. By, using Chemeo database the Chemical and Physical Properties of Aspirin were determined.
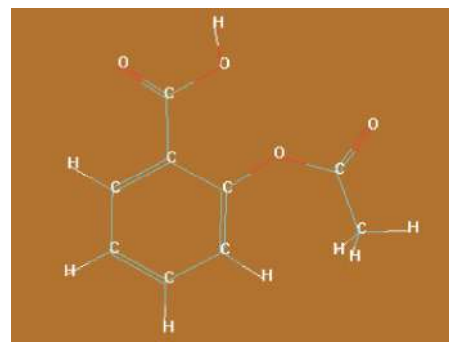
Figure 1: Structure aspirin obtained by using HyperChem 7.5 software.

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Numerical Illustration for Availability Function of Two Unit Non Identical System using M.L. Estimation.

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Abstract:

This paper presents the method of Maximum Likelihood Estimation to evaluate the estimate of availability [Av(t)] function of a two unit non-identical system under the influence of Lethal and Non-lethal Common Cause Shock (CCS) failures. The estimates of the above measures are given for series system. The numerical evidences are given to justify the use of maximum likelihood estimation in the present case.

Keywords: M L estimation, System Availability, CCS failures, Monte-Carlo simulation

INTRODUCTION

The system reliability evaluation usually assumes that components are subject to self-failures only. But components are often further subject to Common Cause Shock (CCS) failures. Failure to consider CCS failures results in exaggerating system reliability and availability. These CCS failures are of two types namely, lethal and non-lethal Common Cause Shock (LCCS & NCCS) failures. Hence many methods of system reliability evaluation with CCS failures have been developed [1-7]. Billinton and Allan [2] discussed the role of CCS failures. Atwood [1], Meachum and Atwood [4] used the BFR model for CCS failures to the data associated with nuclear power plants and given in the nuclear regulatory commission reports. The quantification and estimation of CCS failure rates were discussed by them. Chari et. al [3] discussed the concept of CCS failures in evaluation of reliability and availability measures. Reddy Y R [5] developed the reliability and availability functions for 2-unit system in the presence of lethal and non-lethal common cause shock failures. Sagar G Y [6] and Verma et.al [7] discussed the role of CCS failures as well as human errors in evaluating system reliability. This paper attempts the estimation of availability and frequency of failure functions for two component non-identical system with LCCS and NCCS failures by M L estimation approach in the case of series systems.

Assumptions:

(i) The system has two statistically -independent and non-identical units.

(ii) The system is affected by lethal as well as non-lethal CCS failures in addition to individual failures.

(iii) The components fail individually at the rate λ_i and failure probability is 'p$_i$'and also fail simultaneously when LCCS failures hit the system at a rate 'ω'.

(iv) The components fail due to NCCS failures, which is occurring at the rate of 'β' and failure probability is 'p$_2$'.

(v) The individual failures, LCCS and NCCS failures occur independently with each other and follow exponential distribution.

(vi) The failed components are serviced singly and service time follows exponential distribution.

NOTATIONS.

$\lambda_{i1}, \lambda_{i2}$: failure rates of 1st and 2nd components respectively

λ_{12} : rate of common mode failures.

ω : rate of LCCS failure

β : rate of NCCS failure

μ_0, μ_1 : Service rates of the 1st and 2nd components respectively

$Av_{LNS}(t)$: time dependent system availability for the series configuration.

$\widehat{Av_{LNS}}(t)$:M L estimate of time dependent system availability for series configuration.

$\bar{x}$: sample mean of individual failures

$\bar{y}$: sample mean of NCCS failures

$\bar{\omega}$: sample mean of LCCS failures

$\bar{z}$: sample mean of service time of the components

$\hat{\bar{x}}$: sample estimate of individual failure rate

$\hat{\bar{y}}$: sample estimate of NCCS failure rate

$\hat{\bar{w}}$:sample estimate of LCCS failure rate

$\hat{\bar{z}}$:sample estimate of service time of the components

N : number of simulated samples

MSE : mean square error.

Effect of Chemical Reaction and Radiation on MHD Flow along a moving Vertical Porous Plate with Heat Source and Suction

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Abstract:

In this article, we consider effects of force buoyancy and magnetohydrodynamic on convective mass and heat transfer flow past a touching vertical porous plate in the incidence of thermal radiation and chemical reaction. The governing partial differential equations are concentrated to a system of self-similar equations using the similarity transformations. The resulting equations are solved numerically using the 4th order Runge-Kutta method along with the shooting technique. The outcomes are found for the velocity, temperature, concentration, Nusselt number, Sherwood number and skin-friction. The effects of various parameters on flow variables are illustrated graphically, and the physical aspects of the problem are discussed.

Key words: MHD, porous medium, heat and mass transfer, thermal radiation, chemical reaction.

INTRODUCTION

 In recent years, the problems of free convective heat and mass transfer flows through a porous medium under the effect of a magnetic field have attracted the attention of many researchers because of their possible applications in many branches of technology and science, such as its applications in transportation cooling of re-entry vehicles and rocket boosters, cross-hatching on ablative surfaces and film vaporization in combustion chambers.

R.Wooding[2] has studied steady State Free Thermal Convection of Liquid in a Saturated Permeable Medium. Rapitset.al.,[3] have analyzed magneto Hydrodynamics Free Convective Flow and Mass Transfer through a porous Medium Bounded by an Infinite Vertical Porous Plate with constant Heat Flux. Abdus et.al.,[4]have been presented unsteady free-convection interaction with thermal Radiation in a boundary layer flow past a vertical porous plate. Bakier[5] was investigated thermal radiation effects on horizontal surfaces in saturated porous medium. England [6] studied thermal radiation effects on the laminar free convection boundary layer of an absorbing gas, J. of Heat Transfer. Acharya et.al.,[7] analyzed the magnetic Field Effects on the Free Convection and Mass Transfer Flow through Porous Medium with constant Suction and constant

Heat Flux. Das et.al.,[8] have discussed three-Dimensional Free Convective MHD Flow and Heat Transfer through Porous Medium. Muthucumaraswamy et.al.,[9]analyzed effect of a Chemical Reaction on a Moving Isothermal Vertical Surface with Suction. Kim et.al.,[10] have studied heat and mass transfer in MHD micropolar flow over a vertical moving porous plate in a porous medium. Makinde [11] presented free Convection Flow with Thermal Radiation and Mass Transfer Past a Moving Vertical Porous Plate. Ibrahim et.al.,[12] gave an exact solution for effect of the chemical reaction and radiation absorption on the unsteady MHD free convection flow past a semi-infinite vertical permeable moving plate with heat source and suction. Mostafa et.al.,[13] studied thermal radiation effect on unsteady MHD free convection flow past a vertical plate vertical plate with temperature-dependent viscosity. Later some authors studied on MHD, chemical reaction and radiation effects, see[1,14-26].

Henceforward, the impartial of this research paper is to analyses the effect of radiation on MHD free convection flow past along a moving vertical porous plate in presence of thermal radiation and chemical reaction. The governing equations are changed by the resultant dimensionless equations are resolved numerically by using shooting technique and using unsteady similarity transformation. The effects of different governing parameters on the concentration, temperature, velocity, are obtained.

MATHEMATICAL ANALYSIS

Consider an unsteady two-dimensional free convection flow of a viscous incompressible electrical conducting, thermal radiating and chemical reacting fluid flow along a moving vertical porous plate immersed in a porous medium. The x-axis is taken along the plate in the upward direction and y-axis is taken normal to the plate. The fluid is considered to be a gray, absorbing emitting radiation but non-scattering medium and the Rosseland approximation is used to describe the radiation heat flux in the energy equation. A uniform magnetic field is applied in the direction perpendicular to the plate. The fluid is assumed to be slightly conducting, and hence the magnetic Reynolds number is much less than unity and the induced magnetic field is negligible in comparison with the applied magnetic field. It is assumed that the external

A Generalized Fixed Point Theorem for Three Self-maps

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Abstract

A common fixed point theorem of the authors [3] has been generalized under a weaker inequality through the notion of asymptotic regularity for weakly compatible maps on a metric space.

AMS Subject Classification: 54H25

Keywords and Phrases: Asymptotic regularity, Orbitally complete metric space, Weakly compatible self-maps, Common fixed point.

1. INTRODUCTION

Let (X, d) be a metric space. Given $x_0 \in X$ and self maps A, S and T on X, if there exist points $x_1, x_2, \ldots x_n \ldots$ in X such that

$$Sx_{2n-2} = Ax_{2n-1}, \; Tx_{2n-1} = Ax_{2n} \text{ for } n = 1, 2, 3, \ldots,\text{...(1)}$$

then the sequence $\langle Ax_n \rangle_{n=1}^{\infty}$ is an (S, T)-orbit at x_0 with respect to A.

Definition 1: The space X is (S, T) – orbitally complete [2] with respect to A at x_0, if every Cauchy sequence in some orbit of the form (1) converges in X.

Definition 2: The pair (S, T) is asymptotically regular [2] at x_0 with respect to A, if orbit (1) satisfies the condition that $d(Ax_n, Ax_{n+1}) \to 0$ as $n \to \infty$.

Definition 3: Self maps A and S are said to be weakly compatible [1], if they commute at their coincidence point.

In [3], the following result was established:

Theorem A. Let S, T and A be self-maps on a metric space (X, d) satisfying the inclusions

$$S(X) \subseteq A(X) \text{ and } T(X) \subseteq A(X) \qquad \text{...} \qquad \text{(2)}$$

and the inequality:

$$d(Sx, Ty) \le \varphi\left(\max\left\{ \begin{array}{l} d(Ax, Ay), \\ d(Ax, Sx), d(Ay, Ty), d(Ax, Ty), d(Ay, Sx) \end{array} \right\} \right)$$
$$\text{for all } x, y \in X, \qquad \text{... (3)}$$

where ϕ is non-decreasing upper semi-continuous contractive modulus.

Given $x_0 \in X$, suppose that

(a) The pair (S, T) is asymptotically regular at x_0 with respect to A.

(b) Any one of $S(X)$, $T(X)$ and $A(X)$ is orbitally complete at x_0 them S, T and A have a common coincidence point. Further, if

(c) Either (A, S) or (A, T) is weakly compatible then S, T and A have a unique common fixed point.

We prove that a common fixed point is ensured by replacing (3) with a weaker form.

2. MAIN RESULT

Theorem B: Let S, T and A be self-maps on a metric space (X, d) satisfying the inclusions (2), and the inequality

$$d(Sx, Ty) \le \max \left\{ \begin{array}{l} \varphi(d(Ax, Ay)), \varphi(d(Ax, Sx)), \varphi(d(Ay, Ty)), \\ \varphi(d(Ax, Ty)), \varphi(d(Ay, Sx)) \end{array} \right\}$$
$$\text{for all } x, y \in X, \qquad \text{... (4)}$$

and the conditions (a), (b) and (c). Then A, S and T will have a unique common fixed point.

Proof. Let $x_0 \in X$, and self maps A, S and T satisfy the inclusions (2). Then we can find the points $x_1, x_2, \ldots, x_n, \ldots$ in X to define $\mathrm{O}(x_0) = \langle y_n \rangle_{n=1}^{\infty}$ such that

$$y_{2n-1} = Sx_{2n-2} = Ax_{2n-1}, y_{2n} = Tx_{2n-1} = Ax_{2n} \text{ for } n = 1, 2, 3, \ldots.$$

We now show that $\langle y_n \rangle_{n=1}^{\infty}$ is a Cauchy sequence.

Suppose that it is not Cauchy. Then for some $\varepsilon > 0$. We choose sequence $(2m_k)_{k=1}^{\infty}$ and $(2n_k)_{k=1}^{\infty}$ of even integers such that $d(y_{2mk}, y_{2n_k}) \ge \varepsilon$ for $2m_k > 2n_k > k$ for all k. Let $2m_k$ be the smallest even integer with this property so that $d(y_{2mk-2}, y_{2nk}) < \varepsilon$. Using the triangle inequality of d and asymptotic regularity (a), above inequalities give

$$\lim_{n \to \infty} d(y_{2mk}, y_{2nk}) = \lim_{n \to \infty} d(y_{2mk}, y_{2nk+1}) =$$
$$\lim_{n \to \infty} d(y_{2mk+1}, y_{2nk+1}) = \lim_{n \to \infty} d(y_{2mk+1}, y_{2nk+2}) \quad \text{(5)}$$

Fitting of Probability Distribution for Analyzing the Rainfall Data in the State of Andhra Pradesh, India.

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Abstract

The study of analysis of rainfall is vital to find the relevant distribution model to anticipate the natural phenomena (earthquake, floods, rainfall f. ect..) .The main theme of this study to determine the best fit of probability distribution in the case of frequency of daily rainfall in past 35 years (1982-2017) from 24 districts of the state of Andhra Pradesh. India. by using different statistical analysis and probability distributions. The daily rainfall data are analyzed using two different probability models. those are Double Exponential Distribution and Log Normal Distribution. Efficiency of the both probability models are compared using Root Mean Squared Error (RMSE) value of Chi-square Goodness of Fit. It is precisely witnessed that the Double Exponential Distribution was identified to be the best fit for forecasting daily rainfall (mm).

Keywords. Rainfalls, Probability distributions. Root mean squared error, Double Exponential Distribution and Log Normal Distribution.

INTRODUCTION

The study of rainfall data is one of the important event in hydrological cycle. It is the major component of the water cycle for accumulating the large amount of water on the universe. It provides many types of ecosystems, for crop irrigation and hydroelectric power stations This plays a important role in many non agricultural and agricultural applications. The average rainfall in our country is 1185mm per year and it ranges from 339 mm to 2250 mm annually. Normally 80 to 85% of the total annual rainfall in India accounting from the months of June to September. Rainfall is a unique phenomenon that is highly diversified with respect to space and time. Analysis of Rainfall and computation of daily rainfall should improve the management of water resources application and the effective utilization of water. Probability and frequency study of rainfall data enables us to determined the expected rainfall at various rates. this

information is also used to prevent floods and droughts and apply to development and designing of water resources associated to technology such as reservoir design. flood control work and soil and water conservation setting up like dames.

MATERIAL/METHODS

The rainfall data (1982-2017) collected from Indian meteorological department. The present study determined on versatile of rainfall using Double Exponential and Lognormal Distribution for stochastically analysis.

STOCHASTIC ANALYSIS.

The following formulae are used for the basic statistical analysis such as Arithmetic Mean. Standered error. Coefficient of variation and coefficient of Skewness.

Arithmetic Mean $= \bar{y} = \frac{\sum yi}{n}$

Standard Error $(S_n) = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$

Coefficient of Variation $(c.v) = \frac{\sigma}{\bar{v}} \times 100$

Coefficient of Skewness $(C_s) = \frac{n\sum(wi-\bar{w})^3}{(n-1)(n-2)S_n}$

$W =$ log value of rainfall data

$\bar{w} = Mean\ value\ of\ Rainfall\ data$

$(n) =$ Sample size

Rainfall data fitted using various probability distributions Those are Double Exponential distribution .Lognormal distribution and Chi square goodness of fit.

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Rainfall Forecast Through RMSE among Continuous Probability Distributions .

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500075,Telanagana (state) ,India.

Abstract.

The study of analysis of rainfall is vital to find the relevant distribution model to anticipate the natural phenomena (earthquake, floods, rainfall , ect..) .The main theme of this study to determine the best fit of probability distribution in the case of frequency of daily rainfall in past 35 years (1982-2017) from 24 districts of the state of Andhra Pradesh, India, by using different statistical analysis and continuous probability distributions. The daily rainfall data are analyzed using three different probability models, those are Double Exponential Distribution, Gompertz Probability Distribution and Log Normal Distribution. Efficiency of the all probability models are compared using Root Mean Squared Error (RMSE) value of Chi-square Goodness of Fit. It is precisely witnessed that the Double Exponential Distribution was identified to be the best fit for forecasting daily rainfall (mm).

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Introduction:

The study of rainfall data is one of the important event in hydrological cycle. It is the major component of the water cycle for accumulating the large amount of water on the universe. It provides many types of ecosystems, for crop irrigation and hydroelectric power stations. This plays a important role in many non agricultural and agricultural applications. The average rainfall in our country is 1185mm per year and it ranges from 339 mm to 2250 mm annually. Normally 80 to 85% of the total annual rainfall in India accounting from the months of June to September. Rainfall is a unique phenomenon that is highly diversified with respect to space and time. Analysis of Rainfall and computation of daily rainfall should improve the management of water resources application and the effective utilization of water. Probability and frequency study of rainfall data enables us to determined the expected rainfall at various cases, this information is also used to prevent floods and droughts and apply to development and designing of water resources associated to technology such as reservoir design, flood control work and soil and water conservation setting up like dames.

Material/Methods.

The rainfall data (1982-2017) collected from Indian meteorological department. The present study determined on versatile of rainfall using Double Exponential , Gompertz Probability Distribution and Lognormal Distribution for stochastic analysis.

MHD Flow Past an Impulsively Started Vertical Plate with Variable Mass Diffusion and Rotation Effect

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ABSTRACT

This paper investigates unsteady MHD flow past an impulsive started vertical plate with variable mass dispersion and Rotation effects is considered here. The governing equations are associated with the present investigation are solved by the efficient Gelerkin method. The velocity, concentration and skin friction are studied for various parameters like mass Grashof number, Magnetic field parameter, Schmidt number, time and rotation parameter.

Keywords:— Rotation effects, mass diffusion, Finite element method, MHD.

I. INTRODUCTION

Examination of MHD flow with heat and mass transfer plays an important in engineering sciences. Some basic applications are cooling of nuclear reactors, liquid metals fluid, and power generation system and streamlined. Murali et.al [1] studied an unsteady magnetohydrodynamic free convective flow past a vertical porous plate. Heat and mass transfer effects on unsteady MHD free convection flow near a moving vertical plate in porous medium was studied by Das and Jana [2]. Chaudhary andArpita[3] has given an exact solution of magnetohydrodynamic convection flow past an accelerated surface embedded in a porous medium. Shankar Goud and Raja

Shekar[4] have discussed the finite element solution of viscous dissipative effects on unsteady MHD flow past a parabolic started vertical plate with mass diffusion and variable temperature. Muthucumaraswamy and Ganesh [5] studied an unsteady flow of an incompressible fluid past an impulsively started vertical plate with heat and mass transfer. Unsteady MHD flow past impulsively started vertical plate in porous medium with heat source and chemical reaction analyzed numerically by Rajput and Shareef[6]. Hady et.al [7]studied the MHD free convection flow along a vertical wavy surface with heat generation or absorption effect. Unsteady MHD convection flow of polar fluids past a vertical moving porous plate in a porous medium discussed by Kim [8].Shankar Goud [9] have shown MHD flow past a vertical oscillating plate with radiation and chemical reaction in porous medium- finite difference method. Ibrahim and Makinde [10] have discussed radiation effect on chemically reacting (MHD) boundary layer flow of heat and mass transfer through a porous vertical flat plate. Dufour and Soret effects on unsteady MHD free convection and mass transfer flow past a vertical porous plate in a porous medium studied by Alam et.al[11].Muthucumaraswamy[12] presented the effects of a chemical reaction on a moving isothermal vertical surface

NUMERICAL SOLUTION OF FLOW OF VISCOELASTIC LIQUID THROUGH RECTANGULAR AND SQUARE CHANNELS

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ABSTRACT:

The numerical solution of the flow of viscoelastic liquid under the influence of three types of pressure gradient through a pipe whose cross section is rectangle has been studied. Nine point finite difference formula is applied to descricize the governing equations. The system of difference equations are then solved by MATLAB. Graphs depicting the velocity distribution are drawn for different types of pressure gradient.

KEY WORDS: Viscosity ,Shear stress, Finite difference methods, Stress tensor,

Non -Newtonian fluid, kinematic viscosity.

INTRODUCTION:

The behavior of non-Newtonian liquids such as paints, thick oils, colloids blood etc. cannot be explained by classical hydrodynamic stress rate of strain relations. Generalizing the stress rate of strain relations of classical hydrodynamics the rheological behavior of the non-Newtonian liquids have been studied by Rivlin[9],and Reiner [7]. Longlois and Rivlin [4] studied the slow and steady state flow of Viscoelastic liquids through non circular tubes. Rivlin [9] discussed some exact solutions of Viscoelastic fluids. Dutta [1] obtained the solutions for Maxwell fluid. Jones and Walters [2,3] discussed the oscillatory motion of Viscoelastic liquid. Elsayed, et.al.[10] have studied peristaltic Viscoelastic fluid motion in a tube. Daniel.D and Joseph [12] have studied viscous and Viscoelastic potential flow. Paluo.J and Oliveria [11] have studied a symmetric flow of Viscoelastic fluids in symmetric planner expansion geometries. In this paper, the flow of Viscoelastic liquid through rectangular and square channels is studied. Nine point

EFFECT OF MHD CONVECTIVE STEADY FLOW AND HEAT TRANSFER OVER A SHRINKING SHEET EMBEDDED IN A POROUS MEDIUM IN THE PRESENCE OF SUCTION

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Abstract : In this paper an investigation on heat transfer through a porous medium due to shrinking sheet with the presence of suction. The governing equations are transformed to a couple of nonlinear ordinary differential equations by using the similarity transformations and coupled ODE's are solved by using the MATLAB in built solver bvp4c. The impacts of non-dimensional parameters like suction parameter (S), magnetic parameter (M), permeable parameter (K) are examined with the assistance of graphs.

IndexTerms - Heat transfer, MHD, Steady flow, Porous medium, Suction, Shrinking sheet.

I. INTRODUCTION

The Magnetohydrodynamics flow and heat transfer over a shrinking sheet has numerous applications, for example, glass fiber creation, wire drawing, metal spinning, paper production and polymer processing and various others. This fluid flow has gotten consideration of numerous researchers because of its applications. The strategy of this flow is principally utilized in decontamination of molten metal from non-metallic inclusion. Gupta and Gupta [1] studied the heat and mass transfer on a stretching sheet with suction or blowing. Dutta et.al [2] analyzed the temperature field in flow over a stretching sheet with uniform heat flux. Convection heat transfer at a stretching sheet with suction or blowing was studied by Vajravelu [3]. Swati Mukhopadhyay[4] discussed on MHD boundary layer flow and heat transfer over an exponentially stretching sheet embedded in a thermally stratified medium. Influence of thermal radiation on the boundary layer flow due to an exponentially stretching sheet was analyzed by Sajid and Hayat[5]. Numerical solution of the boundary layer flow over an exponentially stretching sheet with thermal radiation was studied by Bidin and Nazar [6]. Shankar Goud and Raja Shekar, [7] study the effects of thermal radiation and heat source on MHD free convection over a vertical plate with thermal diffusion and diffusion thermo. Effects of heat source/sink on MHD flow and heat transfer over a shrinking sheet with mass suction was studied by Bhattacharyya [8]. MHD flow and heat transfer over a radially stretching/shrinking disk was investigated by Soid et.al[9]. Pal [10] studied mixed convection heat transfer in the boundary layer on an exponentially stretching surface with magnetic field. Heat transfer over an exponentially stretching continuous surface with suction was investigated by Elbashbeshy[11]. Shankar Goud [12] analyzed the MHD flow past a vertical oscillating plate with radiation and chemical reaction in porous medium- finite difference method.

In the present paper, the effect of the magnetohydrodynamic convective flow and heat transfer through a porous medium due to shrinking sheet with suction and magnetic field. The non-dimensional governing equations are transformed into nonlinear ordinary differential equations by using the similarity transformations. The results are discussed through graphs.

II. MATHEMATICAL ANALYSIS:

Considered the steady 2-dimensional flow of a viscous incompressible, electrically conducting fluid through porous medium due to a shrinking sheet. Cartesian coordinate system is considered in such a way that x-axis taken along the sheet in the direction of motion and y-axis is perpendicular to it. The induced magnetic field is neglected and convective heat with heat flux boundary conditions provides temperature T_w at the surface. The governing equations of the flow are

Autobiographical elements in Nayantara Sahgal's "Prison and Chocolate Cake".

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Abstract

"Autobiography is an account of life which begins with the beginning of a memory and ends with the creation of life ".The present paper tries to focus on the autobiographical elements in Nayantara Sahgal's "Prison and the Chocolate Cake" Sahgal brings out the elements of subjugation and suffering of women, social ups and downs of her own country. She also brings out the political situation which was prevalent at that time. The main themes of her novels are politics and Indian women, Indian tradition. She concentrates on the identity of a woman, exploitation of woman .The characters that she presents in the novels are the reflection of her own self and the problems that she has undergone as a woman and at the same time exposes the real situation that was going on in the society. She feels that woman should recognize her potential as a human being.

The focus of this autobiography is on the freedom struggle of India and her parent's role in them. Prison and chocolate cake is full of memories of her family, the importance given towards the political life by her family at Anand Bhavan in Allahabad.Her Writings Possess the qualities of a journalist which shows her interest in the minute details of the political life.

"From fear set free" is a follow-up of the first one "Prison and the Chocolate cake". It projects the Gandhian influence on the writer. In this novel the writer's personal experience is projected more than the political activities. The essence of both the books is through her personal experience the writer reaches the freedom of her spirit. It is the depiction of her own story in two main parts namely "From fear set free" and "Prison and the Chocolate cake" In her introduction to the book she gives the address of her home and says that the book was written "The House at 30,"Aurangazeb Road" allotted to her mother,Vijayalakshmi pandit when she was elected as a member of India's first elected Parliament. Right from her childhood she was very much influenced by Gandhian Ideology.

The Introduction to her life story states her intention behind writing her life story: "Prison and Chocolate cake" was intended for myself and my family, and for the circle of friends who had become part and parcel of the atmosphere it described." Her Autobiographies not only depicts

FEMINIST WRITERS AS CHANGE MAKERS: FROM DARKNESS TO DAWN

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ABSTRACT

Feminism can be comprehended as both the ideology and the entire range of intellectual and socio-political efforts for creating a just and humane society for women. In these bold and egalitarian venture feminist writers since ancient times have had a great role to play. Their writings revolutionized the ways in which women and their experiences were understood and portrayed in society. Through their words and actions feminist writers became the agents of transformation by giving voice to the hitherto silenced women. They created a space for women in the educational, public and political sphere by fighting against the various forms of maltreatment and for their rights to literacy, job, employment and political participation. The incessant struggle has brought them enfranchisement and legal rights and has led society to recognize them as individuals who are defined outside the context of their marriage and motherhood. This paper seeks to give a brief overview of feminist writers who made a real change in the world.

KEYWORDS: Feminism, Feminist, Activism, Change.

INTRODUCTION

The word 'feminism' in its broadest sense can be understood as both the ideology and the entire range of intellectual and socio-political efforts concentrated towards creating an egalitarian society for both the sexes. It aims at shattering the hierarchical gender binary and bringing about a positive fundamental transformation in women's lives. As such it strives to underscore the problems of and the perils faced by women. By bringing these into the public gaze, feminism aims to elicit condemnation and eradication of the unjust practices and tries to replace the old prejudicial structure with a progressive one in which all are equal. Feminism does not deny the biological differences of sexes but argues that these natural distinctions between the male and the female cannot be the basis of biases, leading one to dominate and torture the other. Feminists, by their continuous enterprise, have consistently sought to fight for women's rights thereby, bringing out radical changes in women's lives throughout the world. And in this venture to create a society of equals, feminist writers, across the globe

Accepting the queer: towards the LGBT inclusivity in India

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Abstract:

Indian society has been biased towards normativity and is critical and judgmental about those who are not falling in line with the majority. There is homophobia in people and there have been many attacks on the Lesbian, Gay, Bisexual and Transgender (LGBT). This paper aims to study how India transformed from an LGBT tolerant society into an intolerant society and what can be done to reverse this change. The acceptance towards the queer was lost during the British Raj and it continued in independent India. But, the abolition of Section 377 of Indian Penal Code is a big step towards the inclusivity. Marketing, LGBT specific products and different business models to support LGBT will increase the exposure and thus bring considerable change. Performativity of gender and political-will also help increase LGBT inclusivity.

***Keywords**: Gender performativity, Homophobia, Homonormativity, Pink capitalism, LGBT*

Introduction:

India is a very diverse nation with its different castes, creeds, communities, religions, traditions, cultures and languages. It is surprising that even such an inclusive society disregarded the LGBT people. Historically, LGBT people were prevalent in all parts of the Indian subcontinent. Even in the sacred scriptures their presence had been mentioned. Homosexual relations, male bonding, female bonding and sex change were spotted occasionally, if not regularly.

LGBT people enjoyed their lives in the ancient and medieval India, unlike that of modern India. In the Indian medieval history, many a eunuch and napumsaka are part of the palaces and always accompanied queens and royal ladies for the very fact that this association controls infidelity and adultery.

In Buddhist and Hindu (and somewhat differently in Jain) traditions, gender itself is questioned. [1] It was only after Western rulers invaded, the LGBT were being despised.

As the Supreme Court of India struck down the 157 year old colonial law IPC Section 377, now the question is what can be done to bring back the inclusivity in Indian society? While it is easy to talk about consideration, it requires a lot of effort from the stakeholders including government, society and the LGBT themselves.

"Ruth Prawar Jabhvala's Heat and Dust: Narrating Social Realism in Film Adaptations of Indian Fiction in English"

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Abstract

Ruth Prawar Jabhvala a European writer settled in India perceived its society with an unorthodox, clear vision and portrayed through modern lens in cinema. She came here, tried to establish a keen relationship with India and formed a candid point of view about everything that was socially inappropriate. Ruth Jhabvala had shown Indian's misplaced faith in 'Heat and Dust', created awareness through the story of child in this novel, as if she had arrived to India to get the salvation. She says, "I have seen some terrible sight in India. I've lived through a Hindu Muslim riot, and a smallpox epidemic, and several famines, and I think I may rightly say I have been everything that you can see on this earth" (HD 23).

Ruth Prawer Jhabvala is an Indo-anglian writer. Her observation of India is clear and honest. Often the readers become uneasy reading Ruth Jhabvala's records on superstition, agreed social awkwardness, women's domination, poverty and religion etc, but she does not hesitate to reveal her views on India frankly. As a writer, she was viewed and accepted as a modern thought. In 1975, Indian government took more efforts for urbanization. So, in those periods education was concentrated on urban upliftment. So, education did not reach properly to the rural areas leading to rural unemployment. The unemployment was the reason for the poverty. Such aspects were reasoned out strategically even when this work of fiction was translated onto the the screen. Thus "Heat and Dust" is a realistic modern narrative of social circumstances of post Independent India.

Keywords: *Realism, Fiction, Adaptation, Imagery*

Introduction

Cinema theoretically holds social responsibility and each work of visual production needs to be socially viable. A UNESCO report (Dhingra 1963) quoted a speech by Prime Minister Nehru who stated, "…the influence in India of films is greater than newspapers and books combined." Even at this early stage in cinema, the Indian film-market catered for over 25 million people a week- considered to be just a 'fringe' of the population. In line with those numbers and increasing movie going population, the content projected must add value to the society, for positive progress and its common good. In similar lines of thought, this paper aims to discuss Ruth Prawar Jabhvala's *Heat and Dust* and how its film adaptation popularized such social realistic portrayal of post independent Indian social scenario. In that light it also tries to aim at analyzing the imagery in both textual (novel) and visual (film) portrayal with literary values and how they have led to contradictory and even incompatible, but nonetheless extremely relevant interpretations of the novel in its cinematic adaptation.

Portrayal of social realism in films

Indian film history shows the progression from mythological themes of pre-independent India for cultural unification and then to social circumstances of caste, religion. Social realism and such portrayal has been keen to show the effects on society and depict the problems endured by the working class in other words masses, and 'underclass' including homelessness (*Slum Dog Millionaire*), Issues in Education, passions, unemployment and ambition (*3 Idiots*) and the inequalities of social class (*Heat and Dust*). Thus India's 100-year film history spans colonialism, independence, partition and globalisation; a realist Indian cinema emerged parallel to the mainstream as early as the 1930s. With the advance of sound, all-singing-all-dancing melodramas and religious epics grew popular with Indian audiences, but a number of "social-problem" films, naturalistic in their depiction, also found fans, and this, despite being on a less-than-equal footing. Gudavalli Ramabrahmam's "Raithu Bidda" (1939), for instance, was banned by the colonial administration for criticising the zamindars, hereditary Indian landlords who had turned tax collectors for the British. Presently, there has been deviation due the increased importance given to 'entertainment', whereas pure social cinema is mostly informative and educative than entertainment in nature.

The modern thought is to try and have a blend of social content and entertainment, at least through a gripping narration to an effective engagement of the audience.

The elements of social realism in *Heat and Dust*:

Ruth Prawer Jhabvala, an Indo-Anglian wrote novels and screenplays on Indian social issues. Her observation of India is clear and honest. Often the readers become uneasy reading Ruth Jhabvala's records on superstition, women's domination, poverty and dishonest sadhus. She does not hesitate to reveal her views on India frankly. As a writer, she has rights to express her views and at the same time it should be seen and accepted as a modern thought and a work of literary expression.

The post independent India had seen utter poverty, people lived in less hope and more fear leading them to be superstitious and helpless lot. On the contrary, the systems like governance and administration could do little to address those socially affecting issues in India. That's when Ruth Pravar

In this novel, Jhabvalla asserts how superstition has taken a strong hold in the routine life of these simple folks. One night Ritu suffers some sort of a bite. She screams but her mother-in-law places her hand on her mouth. She chants some mantras. Her mother-in-law does not believe modern medical treatment. Instead of taking Ritu to doctor, she treats her by mantras and applying holy ash on her head.

Thematic adaptations of the novel into the film:

The film, "Heat and Dust" is a 1983 romantic drama film with a screenplay by Ruth Prawer Jhabvala based upon her novel, *Heat and Dust*. It was directed by James Ivory and produced by Ismail Merchant. It stars Greta [...] Shashi Kapoor and Julie Christie. The plot of He[...] ws [...] intertwined stories. The first is set i[...] ls [...] an illicit affair between Olivia, the [...] e of a British colonial official, and an [...] e second, set in 1982, deals with Anne, Oliv[...] ho travels to India hoping to find out about her [...] s life, and while there, also has an affair with a married Indian man.

The film "Heat and Dust" from a Booker prize winning

Analysis and Issues of Artificial Intelligence Ethics in the Process of Recruitment

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Abstract— Artificial intelligence has evolved into a virtual human. Similar to the standards and ethics of humans, Artificial intelligence also has standards and ethics. On the other hand, Artificial Intelligence [AI] technologies should also incorporate moral values. Today, the amount of work done at the university has increased. The amount of time spent for the recruitment of the required faculty has become important for the lifetime of universities. Artificial Intelligence [AI] can be used for the process of recruitment; it will save a lot of time for recruitment board. The primary motivation of this research work is to explore all the AI tools used for recruiting and the challenges of incorporating AI tools in the process of recruitment.

Keywords: Artificial Intelligence, Ethics, biometrics, screening, interview, KNearestneighbour, SVC, Decisiontree

the human cognitive abilities. At some point it is believed that, the AI will exceed the position of humans. Today AI is being used in various industries like developing self-car driving in automobile industry and detecting a fraudulent transaction in debit card in financial industry.

There are two types of AI: One is delicate AI, it comprises PC games and unique assistants such as Alexa and Apple's Siri. Second is Powerful AI, it comprises of delivering the problem-solving capabilities without human intervention.

Machine learning delivers the output without explicit programming. It learns by training set and tries to predict the

A REVIEW TOWARDS EVALUATING SPECTRUM RESOURCES TO SATISFY IOT NEEDS

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ABSTRACT

Spectrum sharing is a preferable solution for IoT due to the scarcity of available spectrum resource. In particular, mobile operators are inclined to exploit the existing standards and infrastructures of current cellular networks and deploy IoT within licensed cellular spectrum. Yet, proprietary companies prefer to deploy IoT within unlicensed spectrum to avoid any licence fee. In this paper, we provide a survey on prevalent IoT technologies deployed within licensed cellular spectrum and unlicensed spectrum. Notably, emphasis will be on the spectrum sharing solutions including the shared spectrum, interference model, and interference management. This paper aims to provide a detailed review on evaluating spectrum resources to satisfy the needs of IoT.

Index Terms: IoT, spectrum resources, interference model

I. INTRODUCTION

As the foundation of smart cities, Internet of Things (IoT) has become the cornerstone for deepening the construction of the "urban brain", in which numerous intelligent sensors, devices, and vehicles are connected to realize continuous coverage of urban areas and high-capacity coverage of key scenes. In smart cities, people's demand for mobile Internet high-traffic applications and the need for IoT are enormous. This big-data-driven IoT would be the main driving force for the fifth- generation (5G) infrastructure deployment in smart cities, and also the industry believes that 5G can provide comprehensive support for ubiquitous IoT applications. It is estimated that by 2021, there will be 28 billion mobile devices connected, of which 16 billion will be IoT-based sensors [1]. The amount of data generated by numerous sensors is growing at an exponential rate that far exceeds our expectations, and the types of data are

An Automated VM Security Framework for Live Migration

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Abstract: With the unbounded growth in the infrastructures for application hosting, demand from the consumers of the applications and the trade-off between the application availability with cost for application hosting is pushing the application providers towards cloud.The support from the cloud computing towards the application development are the dynamic load balancing, saving cost for energy and in premises hardware dependency. The dynamic load balancing is made possible by the concept of migrations of virtual machines or VMs. The migration includes identification of high loads on specific hosts, identification of possible virtual machines to be migrated and possible target hosts, where the VMs can be migrated. The challenge of migrating the virtual machines from the source to the destination physical hosts is during the migration process the virtual machines are exposed to the network and the other users available or have access to the same communication channels. Also, the virtual machines data to be made live in the target physical system, popularly called the VM images, are treated as regular files before those are live. Hence in the migration cycle, starting from the transfer of the virtual machine image and till the transferred virtual machine is live, there is a gap of security and which needs to be filled. The virtual machine images often contain the application, data generated by the application and data to be consumed by the application. Regardless to mention these three components are critical and must be prevented from the unauthorised access. Hence, a number of research attempts have proposed various schemes to secure the VM images by employing various encryption mechanisms. There methods are criticised for consuming high amount of computing capabilities for encrypting – decrypting VM images and resulting into violation of service level agreements by making the application not available for higher time.Thus, this work proposes a novel method for encrypting a higher volume VM image in less time by deploying a progressive and adaptive encryption method. The work also establishes the thought of the improvement by testing the algorithm in the light of SLA violation reduction compared with existing methods.

Keywords : Adaptive Encryption, Channel Security, VM File progressive Encryption, VM File Security, VM File Segmentation

I. INTRODUCTION

The use of cloud computing intrigued the reduction in cost and increase in efficiency of application hosting industry.The basic of these advancements in the field of infrastructure management is the virtualization. Virtualization allows multiple operating systems to run in parallel on a single physical system, thus enables all the virtual machines to work under isolation. The work by Barham et al. [1] elaborates on the techniques and advantages of virtualization. With the visible advantage of higher utilization of the physical resources available, virtualization gains a high popularity among the owners and managers of data centres for hosting applications. Also, the consumers and the application owners are also inclined towards this benefit. The statistics provided by the Clark et al. [2] is a significant evidence of this fact. The capabilities of virtual machines are not limited in segregating the physical resources from one physical system, rather using virtualization, a number of physical resources can be collated together to serve a higher demand. This significantly reduces the cost of maintaining individual servers separately for single application. The reduction of cost can also be visualized in terms of physical space required for hardware peripherals, power consumptions, cooling and as mentioned by various researchers, in terms of man power as well. The work by Padala et al. [3] and the work by Murugesan et al. [4] particularizes on the strategic benefits from virtualization.

The advantage of bringing cloud computing into the mainstream of application hosting is the availability of load balancing and migration of the virtual machines from one physical host to another with higher or lower capabilities. The load balancing is made possible by deploying the concept of VM migration. The migration in practical can be static or live. The static migration is the mechanism where the actual virtual machine is shut down, then migrated to another physical host and then start again to host the application or services. During a static migration, the service is expected to be interrupted. In the other hand, during the live migration, the initial image of the virtual machine is still running during the migration process. Once the migration is completed and the next virtual machine is up and running, then the first image of the virtual machines can be shut down. This method can compromise on the cost of power consumption as both the virtual machines on both of the physical servers will be running during the complete migration process. Regardless to mention that the virtual machine images or the virtual machine data will be transferred from the source physical system to the destination physical system over the network, thus can be visible to all the users having access to the same communication channel. This problem has to be addressed in order to make cloud computing a better and safer place.

The work of Djenna et al. [5] elaborates on this issue and attracts the attention of the researchers. In further, the notable survey by Ristenpart et al. [6] and W. Fan et al. [7] points to the fact that during migration, the virtual machine data is migrated as plain text and can easily be sniffed.

Thus, this work aims to solve this issue and in parallel address the other relevant issues to this fact as:

- During migration of the virtual machine data or the VM images, the encryption is a must to incorporate.

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A Unique Six Sigma Based Segmentation Technique for Brain Tumor Detection and Classification using Hybrid CNN-SVM Model

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Abstract: An intelligent organizing scheme to detect and classify normal, abnormal MRI brain sequences has been illustrated here. At present, handling of brain tumors disease and decision is based on radiological appearance and its symptoms. Magnetic-Resonance-Imaging (MRI) is a powerful substantial precise instrument for functional conclusion of brain tumorous. In existing study, broad range of methods is used for brain cancer detection and classification. Under this methods viz., image pre-processing, enhancement, segmentation, feature mining and resulting classification is efficiently conducted. Furthermore, when various machine learning algorithms like: Six Sigma, Convolutional Neural Network (CNN), Support Vector Machine (SVM), are employed to detect and extract the tumor region and classify numerous sequence of imageries, it is witnessed from our results that this Hybrid CNN-SVM model gives maximum classification accuracy rate of 99.33% compared to previous models. The foremost aim of this research is to get an effective result for detecting type of brain tumor using six sigma based segmentation technique, and to achieve efficient classification rate, using hybrid CNN-SVM model.

Index Terms: Classification, CNN, Hybrid CNN-SVM, MRI, Six Sigma Segmentation, SVM, Tumor.

I. INTRODUCTION

Brain is the most composite part in human body which has billions of cubicles. A tumor is formed if there are unrestrained separating cells creating an irregular group of cells inside the brain [2]. Every year worldwide, 12.7 million people getting diagnosed with brain diseases. A tumor is anomalous cells development inside the brain. Tumorous can be malignant (cancerous) or benign (noncancerous) [3]. Compared to usual cells, cancer cells concerns about abandoned cell growth and can grow to adjacent tissue. Even though benign tumor can grow bigger and damage healthy tissues and organs that cause hypothetically disturbance to their functioning, they rarely conquer other tissue [4]. A foremost tumor begins from brain itself, whereas inferior brain tumorous (i.e. metastatic tumorous) initiates from other parts in body. The proposed design comprises following modules: pre-processing, feature mining (extraction), and training with classification. Pre-processing will be applied to give better superiority of image brain sequences.

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Medical images sequences are despoiled from various types of noises. It is much essential to get better quality of brain sequences for precise interpretations for given domain application. Feature mining denotes extraction of number of reckonable measurements of image sequences basically utilized for pathology decision making related to tissue structure. Renovating input set of data to set of comparative textures is known as extraction of features. Choosing features is an important processing stage in identification and classification of issues, and it can applicable efficiently to several fields.Classifiers like, SVM, KNN, CNN, Probabilistic Neural Network (PNN), Artificial Neural Network (ANN), Hidden Markov Model (HMM), etc. are utilized in diverse real time applications. Every single classification algorithms named before has its own associated and distinct properties along with drawbacks. In KNN, foremost drawback is that it makes use of all features which is computationally difficult, when size of training set raises. Alongside, precision of k-nearest neighbor classifier is brutally corrupted through existence of noisy and dissimilar features, mainly while number of attributes increases. In PNN, drawback is compared to MP (multilayer perceptron) networks, it is slower than and it demands extra memory space. ANN gives better classification outcomes than others with higher dimensional features. However, memory usage and high computing cost is the foremost drawback of ANN. Bayesian model performs in lowest computational cost but it is less precise than the traditional method such as CNN.

II. LITERATURE SURVEY

The literature survey of the proposed work setup on research carried out by many researches related to classification brain tumor.

Tanvi Gupta et.al [01] has evaluated its utility for rapid diagnosis and accuracy of intellectual tumors. 200 themes were categorized into usual and unusual by employing FLAIR acquirement. The sequences are standardized to get 12 beneficial pieces to be measured as patient feature map for grade. DWT is employed for mining of features and PCA is taken for selection of mined features. SVM (Support-Vector-Machine), CART (Classification and Regression Tree), k-NN (k-Nearest Neighbor), and RF (Random forest) classifiers are verified. Conducting K-fold cross authentication in every train-test ratios, they acquired ceiling level classification accuracy with intelligible specificity and sensitivity utilizing only linear SVM.

THREE LAYER PRIVACY PRESERVING CLOUD STORAGE SCHEME USING FOG COMPUTING

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Abstract

Every sort of information is saved in the cloud and also it can be quickly accessed in at any moment and also any type of location. However, while coming privacy in cloud computing is tipping behind because of area understanding. So we are presenting three layers privacy-preserving cloud storage scheme making use of fog computing is an arising innovation in the area of network solutions where information transfer from one gadget to one more to carry out some sort of task. Fog computing is a prolonged idea of cloud computing. It functions in-between the Internet of Things as well as cloud information facilities and also minimizes the interaction spaces. Fog computing has actually enabled to have actually lowered latency and also reduced network blockage. Fog computing is an on-going study pattern in which the opportunity of reliable network solutions exists. Fog computing can be referred to as a cloud kind platform having comparable solutions of information calculation, information storage space and also application solution yet it is essentially various as it was decentralized. In this paper, we have actually done a thorough study on fog computing & So we are presenting three layers privacy-preserving cloud storage scheme making use of fog computing.

Index Terms : Cloud computing, Internet of Things (IoT), Fog computing

EFFICIENT CLUSTERING ALGORITHM FOR ANALYZING CATEGORICAL DATA STREAMS

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Abstract

The underlying ensemble-information matrix provides just cluster-data factor connections, with numerous entrances being left unidentified. Web click stream analysis, as well as detection of network intrusions, are 2 instances. Collection evaluation on data streams comes to be harder since the information things in an information stream need to be addressed in order as well as gain reads just when or a couple of times with restricted sources. Just recently, a couple of clustering algorithms have actually been established for examining numerical data streams Nevertheless, to our understanding today, no algorithm exists for clustering categorical data streams. In this paper, we suggest an effective clustering algorithm for assessing categorical data streams..

Index Terms : Categorical data, clustering, cluster representative

I.   Introduction

For lots of recent applications, the idea of information stream is better suited than that of the dataset. Naturally, a saved dataset is a proper design when substantial parts of the information are quizzed repetitively, as well as upgrade of information, is reasonably irregular. On the other hand, an information stream is a suitable design when a big quantity of information is showing up constantly. It is either unneeded or not practical to save all showing up information in some types. For instance, gall information getting to buttons of a telecommunication network as well as Internet visit an Internet web server all come from data streams In these applications, choices need to be made sometimes when essential occasions augur. Advancing built up information regularly by bathes, as various other information mining applications, is generally not permitted. The information stream is additionally a proper design for the address to huge information collections saved in additional memory where efficiency demands require direct scans [1].
Scientist ended up being curious about clustering categorical information two decades earlier when Huang (1998) recommended the k-Modes algorithm to especially take care of categorical variables. The k-Modes algorithm is based upon the k-Means algorithm, developed for clustering mathematical variables. It leverages the structure of the k-Means algorithm by trading mean with the setting as the facility of collections as well as the easy resemblance action for determining categorical variables, as opposed to the Euclidean range of mathematical variables. Versions that enhance these 2 critical clustering algorithms (k-Means as well as k-Modes) have actually been suggested for many years. For instance, k-Modes versions have actually been suggested for handling set-valued attributes (Cao et. al., 2017a) as well as matrix-object information (Cao et. al.,

Object Oriented Dynamic Metrics in Software Development: A Literature Review

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Abstract:

Software development is the process of analyzing, designing, programming, documenting, testing, and bug fixing involved in creating and maintaining applications as per the client requirement. In software application development, Object Oriented Programming (OOP) Approach plays a vital role. Object Oriented (OO) metrics are used to measure properties of object oriented software applications. Many software metrics have been developed for OO paradigms such as abstraction, class, object, inheritance etc. to compute various attributes like software quality, coupling, cohesion etc. OO metrics are classified into static and dynamic. The aim of this paper is to analyze the significance of these OO metrics in software development. The limitations of static and dynamic metrics are discussed further. The importance of dynamic metrics and future research scope for the researchers by combining these two metrics: hybrid metrics is also discussed.

Keywords: Software Engineering, Static Metrics, Dynamic Metrics, Object Oriented Metrics, Hybrid Metrics

I. INTRODUCTION

Software metrics are measurements that are used to measure and characterize the software engineering products. Software metrics are one of the most important tools used in Software Engineering in order to enhance the quality of software applications. Software metric is a simple quantitative measure derivable from any attribute of the software life cycle.

The role of software metrics is to locate significant estimates for software products and direct us in intriguing managerial and technical decisions. Software metrics have grown to be an important section of software development and are utilized during every phase of the software development life cycle. The name software metric is connected with varied measurements of computer software and its development. Research in the region of software metrics tends to concentrate predominantly on static metrics which can be obtained by static analysis of the program artifact.

Structured programming applications concentrate on operations rather than data. However data is closely related to their operations in real world applications. Therefore emphasizing on only operations leads to data insecurity. To overcome this Object Oriented Programming (OOP) paradigm came into picture. OOP concepts are most popular in today's software application development. OOP is used to develop software applications to fulfill the requirements of clients.

In this paper, a detailed study of various object oriented metrics has been carried out. Summary of the major contributions of different authors on OO static as well as dynamic metrics have been presented. Also gaps for the future research work to be carried on OO static and dynamic metrics as hybrid metrics were identified.

II. OBJECT ORIENTED PARADIGM

Booch et al. [4] defines object oriented design to be the process of identifying objects and their attributes, identifying operations required on each object and establishing interfaces between objects. Design of classes involves three steps: first, definition of objects, second data members of objects and third, communication between objects. Class design is therefore at a higher level of abstraction than the conventional data or procedural approach. It is the task of class design that makes OOD different from traditional procedural design.

Some of the basic terms commonly used in object oriented metrics are as follows:

1. *Object:* Object is an entity able to save a state and offers a number of operations to either examine or affect this state.

2. *Message:* It is a request to do an operation by an object on the other object.

3. *Class:* A set of objects that share a common structure and behavior manifested by a set of methods. It serves as a template from which object can be instantiated.

4. *Method:* An operation upon an object, available to all instances of class, need not be unique.

APPROACH TO BUILD A MODEL USING DATA SCIENCE/MACHINE LEARNING

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ABSTRACT

The amount of data is increasing gradually in the real world. As the data is increasing, the machines can make use of the data to make effective decisions using certain algorithms called machine learning algorithms. The machines can learn based on the existing data and their corresponding outcomes and can tune themselves such that they can predict the future out of the machine learning models built. This paper aims to provide a means of understanding the roles and responsibilities of each and every individual who plays a part in building machine learning model, steps to build a model and types of various machine learning algorithms.

Keywords: Data scientist, exploratory data analysis (EDA), Feature engineering, Machine Learning, reinforcement learning, Semi-supervised learning, supervised learning, Unsupervised learning

I. INTRODUCTION

In the current modern era, the organizations collect large amounts of data, both for individual studies or continuous operations. The amount of data is growing gradually and becoming a great part of the everyday lives. The widely used term of the massive data is BIG DATA [10].

$$Bit \rightarrow Byte \rightarrow KB \rightarrow MB \rightarrow GB \rightarrow TB \rightarrow PB \rightarrow BIG\ DATA$$

As the data is growing, there needs to be some process which makes the lives easier to analyze process and make meaningful information out of it which helps in the growth of business. Keeping this in mind, tremendous powerful software tools are designed which helps the business make conclusions out of the vast data [12]. Data science is the field of study which is a combination of domain knowledge, computer programming and mathematical and statistical implementation on the digital data to extract meaningful information that helps in making business decisions. Machine learning is a category of algorithm that allows applications to become more accurate in predicting outcomes without being explicitly programmed.

"Machine Learning is the field of study that gives computers the ability to learn without being explicitly programmed"-Arthur Samuel (1959) [4].

IMPLEMENTATION OF HONEY ENCRYPTION TOWARDS PROVIDING SECURITY AGAINST BRUTE-FORCE ATTACK

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ABSTRACT

Because of the wireless idea of Sensor network, secure data transmission starting with one node then onto the next node is turns into a major issue for wireless communication. The wireless network advancements are logically picking up thought. For various circumstance there are distinctive applications are grow, for example, watching, control and following application. For these networks, camera sensor can repossess graphical measurements from a directed field, accepted that essential data for various applications. Such networks have assets constraints to taking care of, capacity, and vitality and transmission data transfer capacity, wonderful numerous outline tests. Due this the wireless sensor networks needs extremely secure communication channel to utilize them being in open field and broadcasting innovation. In this paper to guarantee the security to the different applications we will utilize cryptographic system. We will propose a system to securely transmit provenance for sensor data. We will present compelling technique for provenance data verification. We will outline the new system technique deliberately and experimentally, and the outcomes demonstrate its convenience and proficient for secure provenance encoding and decoding.

Index Terms: Honey Encryption, cryptography, Wireless sensor network, 3DES

CHALLENGES TOWARDS PRIVACY OF BIG DATA IN IOT AND OPPORTUNITIES FOR RESEARCH AND INNOVATION

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Abstract

Big Data is an excessive amount of imprecise data in variety of formats generated from variety of sources with rapid speed. It is most buzzed terms among researcher, industry and academia. Big Data is not only limited to data perspective but it has been emerged as a stream that includes associated technologies, tools and real word applications.Over the last few years, we have seen a plethora of Internet of Things (IoT) solutions, products and services, making their way into the industry's market-place. All such solution will capture a large amount of data pertaining to the environment, as well as their users. The objective of the IoT is to learn more and to serve better the system users. Some of these solutions may store the data locally on the devices ('things'), and others may store in the Cloud. The real value of collecting data comes through data processing and aggregation in large-scale where new knowledge can be extracted. However, such procedures can also lead to user privacy issues. This article discusses some of the main challenges of privacy in IoT, and opportunities for research and innovation. We also discuss some recent trends in Big Data.We also introduce some of the ongoing research efforts that address IoT privacy issues.

Although this paper does not touch each and every dimension of Big Data as it is not possible to make it in a single paper but essential aspects are covered, which may benefit to the people new in Big Data world.

I. Introduction

The Internet of Things (IoT) [1] is a network of networks, in which, typically, a massive number of objects/things/sensors/devices are connected through the information and communications infrastructure to provide value-added services. The IoT allows people and things to be connected Anytime, Anyplace, with Anything and Anyone, ideally using Any path/network and Any service [2]. Additional definitions on IoT are also listed in [2]. It is predicted that, by 2020, there will be 50 to 100 billion devices connected to the Internet [2]. These devices will generate Big Data [3] that needs to be analysed for knowledge extraction. Even though data collected by individual devices may not provide sufficient information, aggregated data

Assessment of Optical Character Recognition Techniques for Hindi Language

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ABSTRACT: Optical Character Recognition(OCR) is one of the actively researched areas in both industry and academia because of its potential applications. OCR is a widely used technology to recognize text inside images, such as scanned documents and photos. OCR technology is used to convert virtually any kind of images containing written text (typed, handwritten or printed) into machine-readable encoded text data. It is a common method of digitizing printed texts so that they can be electronically edited, searched, stored more compactly, displayed on-line, and used in machine processes such as cognitive computing, machine translation, text-to-speech and text mining. OCR engines are used to read typed (machine printed) characters. At present, there are several OCR engines available for usage. One such OCR engine is Tesseract. Tesseract is an optical character recognition engine that can be used with various operating systems. It can recognize over 100 different languages. It does various image processing operations internally before carrying out the actual OCR. Tesseract performs a reasonably good OCR, but there are certain cases where it is not good enough, which can result in a significant reduction in accuracy. The present work involves using different predefined functions and features of MATLAB and various techniques available in MATLAB for improving the efficiency and performance of Optical Character Recognition (OCR) for the Hindi language. The results of this work are subjected to comparison with an existing OCR engine.

KEYWORDS: MCR, Tesseract, MSER

I. INTRODUCTION

Character recognition can be broadly categorized into online and offline methods. In online text recognition, characters and words are recognized real-time as soon as they are written, and therefore, contain temporal information. Online systems obtain the position of the pen as a function of time directly from the interface. This is usually done through pen-based interfaces where the writer writes with a special pen on an electronic tablet.

Off-line handwriting recognition refers to the process of recognizing words that have been scanned from a surface (such as a sheet of paper) and are stored digitally in greyscale format. After being stored, it is conventional to perform further processing to allow superior recognition. The major difference between Online and Offline Character Recognition is that Online Character Recognition has real-time contextual information but offline data does not [2].

An Offline text recognition system processes a static representation of a document. Offline text recognition is divided into two subcategories of typed and handwritten documents. In both subcategories, an image of the document obtained from a scanner or camera is processed. Obviously, due to the variety of handwriting styles and non-standard nature of handwriting, the problem of offline handwriting recognition is the most challenging problem in OCR and it usually requires language-specific methods. On the other hand, OCR of typed documents are very much in demand for practical applications such as historical document analysis, official letter and document processing, and vehicle plate recognition.

The offline character recognition can be further grouped into two types: Magnetic Character Recognition (MCR) and Optical Character Recognition (OCR).

In MCR, the characters are printed with magnetic ink. The reading device can recognize the characters according to the unique magnetic field of each character. MCR is mostly used in banks for check authentication.OCR refers to the

A Comparative Study of Enterprise Blockchain Platforms: Dragonchain and Komodo

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ABSTRACT: Blockchain is a distributed computing platform with potential for digital disruption. Platformization of information technology has resulted in ecosystems that deliver innovative products. Blockchain is revolutionary and blockchain capabilities are evolving. With the emerging needs and requirements, different blockchain platforms have been developed. Blockchain is game changing technology that paves way for trusted transactions among untrusted participants. Diverse variations of blockchain have emerged since bitcoin. Many of the blockchain platforms like Etherium, VeChain, Ripple etc. that were developed till two years ago are not Turing Complete. Blockchain has evolved rapidly over the years and the evolution can be categorised into four eras.Four main eras of blockchain technology are the Monolithic Calculator Era exemplified by Bitcoin, the Mainframe Era with smart contract for which Etherium is an example, The Server Era to improve upon the limitations of smart contract platforms like network congestion, high fees, a lack of scalability, and limited application functionality. Both Dragonchain and Komodo are representative server era blockchain platforms. Finally Composability Era blockchain platforms are yet to evolve. This paper attempts to provide a comparison of major features of two enterprise blockchain platforms namely Dragonchain and Komodo. Both Dragonchain and Komodo are opensource platforms with different design goals and philosophy. The strong reason for choosing Dragonchain and Komodo is that both are Turing Complete. Explorative study approach is employed to consolidate key concepts of these turing complete enterprise digital platforms Dragonchain and Komodo.

KEYWORDS: Turing Complete, digital asset, atomic swap, interchain, multichain, fiat currencies

I. INTRODUCTION TO BLOCKCHAIN

Blockchain is a decentralized, transparent and trusted database, defined as part of the Distributed Ledger Technology (DLT) framework[1]. Blockchain can be considered as an enabling technology of new IT enterprise systems and applications. Though blockchain technology is still in its infancy the compelling security with blockchain will ensure that the technology will quickly find its way into every industry in the world in the future. Smart contracts are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network. Smart contracts permit trusted transactions and agreements to be carried out among disparate, anonymous parties without the need for a central authority, legal system, or external enforcement mechanism. Smart contracts render transactions traceable, transparent, and irreversible.

II. STATE OF THE ART IN BLOCKCHAIN PLATFORMS

In the present digital world, change is the only thing that is constant. A platform is a product that serves or enables other products or services. A platform is a group of technologies that are used as a base upon which other applications, processes or technologies are developed.

DEMONETIZATION IN INDIA: IMPACT ON DIGITAL PAYMENT SYSTEM

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Abstract : Demonetization in India happened on Nov 8th, 2016 by cancelling Rs. 500 and Rs. 1000 currency notes. This is not the first time happened in India. The decision of Demonetization happened 3 times before the latest decision. After the announcement of demonetization, there is so much happened in usage of digital cum cashless payments. The surprise demonetization announcement also did something else: it pushed millions of new users onto the country's digital economic grid. Every state tried to come with new solutions to solve demonetization problem. The farmers' markets of Telangana State experimented with their own electronic payment system where customers with Aadhar-linked bank accounts could buy vegetables using tokens which could be purchased via debit cards at specialized kiosks. The present study is on the impact of demonetization in improving the usage of Digital Payment systems.

IndexTerms - Demonetization, Electronic Payment System.

I. INTRODUCTION

The Indian rupee (INR) is the official currency of the Republic of India. The rupee is subdivided into 100 paise (singular paisa), though as of 2011 only 50 paise coins are tender. The issuance of the currency is controlled by the India. The Reserve Bank manages currency in India and derives its role in currency management on the basis of the Reserve Bank of India Act, 1934. The rupee is named after the silver coin, rupiya, first issued by Sultan Sher Shah Suri in the 16th century and later continued by the Mughal Empire. In a major step to check undeclared black money, the Government of India on the 8 November 2016 announced demonetization of Rs 500 and Rs1000 banknotes with effect from the same day's midnight, making these notes invalid. Apart from combating black money, the stated purpose is also to check fake currency (used to finance terrorism) and corruption. A new redesigned series of Rs500 banknote, in addition to a new denomination of Rs 2000 banknote is in circulation since 10 November 2016. The demonetization of the highest denomination currency notes is part of several measures undertaken by the government of India to stop duplicate notes, black money and funding of illegal activities like terrorism, foreign currency scam etc. The requirement to deposit currency notes in excess of specified limits directly into bank accounts has resulted in the declaration of hitherto unaccounted income, subject to higher tax and other penalties. India has one of the highest levels of currencies in circulation at over 12% of GDP and of this cash, 87% is in the form of Rs 500 and Rs 1,000 notes. With increasing adoption of electronic payments, particularly those driving e-commerce and m-commerce, there is a growing demand for faster payment services which, in turn, facilitate ease in doing financial transactions.

II. LITERATURE REVIEW

The Five Best Digital / cashless payments options in India

2.1 E Wallets

After demonetization, use of e wallets has been implemented at a very large-scale. We have seen those 'chai walas' and other road side vendors accepting Paytm. Paytm is an e wallet and there are many others available.

These e wallets allow users to make payments using mobile number or by scanning a QR code which takes place in a jiffy [10]. We can add money to you paytm wallet online using debit/credit card/net banking. Also there are physical recharge points available all over India where we can add money to paytm e wallet.

There are also many other electronic wallets available in app stores like google play. They include jio money, vodafone mpesa & airtel money. Even banks have launched their own e wallet apps like State bank buddy and Yes Pay. [10]

2.2 Unified Payments Interface

Unified Payments Interface (UPI) is another great way to go cashless. UPI is system of payments. Using unified payments interface, people can transact using their smart phones. To pay using this system called unified payments interface, we need two important things: Smartphone and a Bank Account.[9]

2.3 Plastic Money

It means debit cards and credit cards that are used at ATM's for cash withdrawal and POS machines while shopping. Having a debit or credit cards make us burden free from carrying cash.

Also risk of theft goes down to zero as it needs a PIN carry out transactions. We don't need to carry huge amount of cash with you. Just swipe and go. Debit card payments are made through bank account. Bank account gets debited while paying using debit card. But in case of a credit card, it is a monthly postpaid bill payment system that takes place. [8]

2.4 Net Banking

It is another handy way to get cashless transactions done. All we need is a bank account with e banking facility enabled on it. We can transfer funds to others account from. There is no need of going to bank to get transfers done. We can make all payments and transfers ourself. This is a very convenient way to go cashless in India as well.

EVALUATING STUDENT PERFORMANCE AFTER AUTOMATIC GENERATION OF QUESTION PAPER USING BLOOM'S TAXONOMY

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Abstract : The performance of students in examinations are improving but it become very difficult to know at which level student is performing better and which level he/she is performing other. Blooms taxonomy is a technique developed by Dr. Benjamin Bloom in the year of 1951. Understudy appraisal is an urgent piece of educating and is done through the procedure of examinations and readiness of test question papers has reliably involved scheme. Blossom's taxonomy is a lot of three progressive models used to group instructive learning goals into dimensions of multifaceted nature and explicitness. The cognitive domain list has been the primary focus of most traditional education and is frequently used to structure curriculum learning objectives, assessments and activities. Bloom's taxonomy is a device that can help human services educators expand the profundity of their students' learning.[3] The test with the taxonomy is creating assessments that measure every one of the six levels. There are 19 sorts of psychological procedures that can be grouped into six noteworthy classifications: recall, comprehend, apply, break down, assess, and make. There are four noteworthy classifications of learning: verifiable, applied, procedural, and meta cognitive. Instances of computer-based appraisals of critical thinking are given dependent on the assessment of the subjective outcomes of youngsters' cooperation in an after-school computer club. In this paper, it is considered as the question paper have been given using six levels of Bloom's taxonomy and proposes a model and evaluates the results of student performance.[1]

Index Terms - Bloom's Taxonomy, cognitive, Online Examination.

I. INTRODUCTION

Questions presented in an online course take into consideration the educator to have a superior chance to assess in general understudy understanding than would be accessible in a customary homeroom. In a conventional study hall, when the instructor makes an inquiry, just a single understudy can reply. The educator does not know whether every one of different understudies in the class comprehends the idea except if the person in question effectively communicates with every one of those understudies also. At the point when an inquiry is presented on the web, every understudy will react before he/she pushes ahead through the course.

An examination assumes a significant job in checking the scholarly advancement of understudies. Question Paper Generation In the present current aggressive world is exceptionally intense employment to instructor. For different examinations led in a year in any scholastic course, educators need to make variety of inquiry papers according to the self-sufficient school rules and evaluation prerequisites. It is troublesome for the educators to cover all highlights of the course results furthermore, sidestep duplication of inquiries in the succeeding tests. There is no methodical system and consequently the nature of the inquiry paper depends altogether on an individual educator's experience and capability. On occasion, this whole component may debase standard of the inquiry paper. According to investigate, a quality inquiry paper is a genuine mix of inquiries managed by changed criteria, for example, trouble level, dissemination of imprints over the inquiry paper in type of paper design and the kind of examination. The technique associated with structure of a fair examination paper by a free is testing and complex. Standard of the examination paper depend on different arrangement of details so considering the unmistakable dimensions of students is additionally an urgent parameter and the course results additionally play an indispensable job in arranging a precise inquiry paper. So partner the learning result of the subject to the examination paper is likewise an incredible occupation[4]. Bloom's Taxonomy was made by Benjamin Bloom amid the 1950s and is an approach to order the levels of reasoning skills required in classroom situations. There are six levels in the taxonomy, each requiring a more elevated amount of abstraction from the students. As an educator, you should endeavor to move students up the taxonomy as they progress in their insight. Tests that are composed solely to assess learning are tragically exceptionally normal. Be that as it may, to make thinkers as opposed to students who simply review data, we must join the more elevated amounts into lesson plans and tests.[2]

II. LITERATURE REVIEW

2.1 Knowledge Level: In the knowledge level of Bloom's Taxonomy, questions are asked solely to test whether a student has increased specific data from the lesson. [1] For instance, have they remembered the dates for a specific war or do they know the presidents that served amid specific eras in American History. Question verbs: Define, list, state, identify, label, name, who? when? where? what?

2.2 Comprehension Level : The comprehension level of Bloom's Taxonomy has students go past simply reviewing facts and instead has them understanding the data. With this level, they will almost certainly translate the facts. Instead of simply having the capacity to name the various types of clouds, for instance, the students would most likely understand why each cloud has shaped as such. Question verbs: Explain, predict, interpret, infer, summarize, convert, translate, give example, account for, paraphrase s?

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Antecedents and Consequences of Online Engagement: Measurement and Assessment of Reliability

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Date Written: 2019

Abstract

The present study focuses on a novel relationship marketing concept of online engagement. On the basis of an extensive literature review, the study postulates a series of research propositions to explain the interrelationships between antecedents of online engagement on the one hand and online engagement and its consequences on the other. The study developed a comprehensive framework of a multidimensional online engagement construct and analyzed its antecedents and consequences. Furthermore, the study develops, refines, and validates the measures of online engagement construct, its antecedents, and consequences. The various validation processes employed to assess the psychometric properties of the developed questionnaire to measure online engagement and to study the relationship among its antecedents and consequences were discussed. The current study was carried out in August 2016. The processes undertaken were: content validity, reliability assessment using item to total score, corrected item-to-total, means and variances criterion. Cronbach's alpha correlation coefficient and

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Abstract

The focus of this study is to examine the insider trading behavior in the Indian stock market. The authors have classified the companies into different categories, and logistic regression is employed to identify the factors influencing insider purchase and sale transactions. The pattern of insider trading is examined based on size, book-to-market equity and momentum.

Dissuade Of Crop Insurance In Telangana State

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ABSTRACT
Contribution of Indian Agriculture sector is much higher than the world average and it is also called backbone for Indian economy by providing employment opportunities. Telangana, a newly formed state in India and majority of work force depends on agriculture and allied activities. In India agriculture is called playing dice with rains and even it badly affected by natural calamities, pests and diseases too. Crop Insurance is one the best option to mitigate the risk that associated with the agriculture sector. Agriculture Insurance Company of India ltd (AICI) one of the general insurance company that dedicated to cover crop insurance in India. AICI statistics shows that only two farmers from Telangana state opted for crop insurance under national agriculture Insurance Scheme. This proposed research will be an explorative in nature to identify the reasons behind farmers not opting for crop insurance. Primary data collected with the help of questionnaire from farmers, interaction with primary agriculture cooperative society secretaries, bankers and Agriculture officers.
Key words: Crop Insurance, Agriculture and Environment, mitigation JEL Classification: G22,Q15

I.INTRODUCTION

Indian agriculture frequently affected by natural calamities such as droughts, floods, cyclones, storms, landslides and earthquakes. In Telangana state all most all crops in rabi and kharif seasons effected by rainfall, heavy winds are very common in nature. To overcome this risk associated with agriculture, taking agriculture insurance is best policy. In the state of Telangana Fifty four percentage of employment in which seventy three percent of rural employment was employed by agriculture and allied activities[1].

Pradhan MantriFasalBheemaYojana (PMFBY) was replaced by Crop insurance scheme updated crop insurance introduced in January 2016 wants to cover 50 percent of farmers in the country in 2019. They use different communication methods for communication.

II. REVIEW OF LITERATURE

Malini, R (2011) in her research article titled" Attitude towards Agriculture Insurance: A study with special reference to Ambasamudram area of Tamilnadu" stated that farmers attitude plays important in implementation of agriculture insurance. It was a study of sixty farmers from the same area (i.eambasamudram) it reveals that farmers have positive attitude towards agriculture insurance but there are some blocks those prevents implementing agriculture insurance and suggested a mechanism for better agriculture income[2].

Mathivanan, R Sasikla Devi D, in their article "Crop Insurance in India" simply described about agriculture insurance in India history, importance, benefits and National Agriculture Insurance scheme (NAIS) in detail[3].

Shrikrishana S.MahajanAmol H. Bobade, in their paper "Growth of NAIS: A Study of Crop insurance in India" tells Monsoon importance in Agriculture and discussed the growth of National Agriculture Insurance scheme and its performance[4].

TibulHoque SK, in his dissertation "Impact of crop Insurance on Agriculture Scenario: A Study on Selected Crops in District of Hooghly(West Bengal)" submitted to University of Burdwan collected data from three hundred and fifty five different categories of farmers analyzed in detail seasons, crops and given some policy recommendations[5].
Ganapathi AK, in his dissertation "A Critical study of the implementation of crop loan and crop insurance scheme through Pune district central cooperative bank Pune district for 2003 to 2008" submitted to SavitribaiPhule Pune University, collected data from six hundred forty loan borrowers and non-loan borrowers from PDC bank of different crops and seasons from three different regions founded that loans are improving productivity and given suggestion that bank should encourage loans to non-borrowed farmers[6].
Karthik TT, in his dissertation "A Study on Crop Insurance in Madurai District" collected data from three hundred and sixty from nine blocks of Madurai district tested attitude of the farmers and satisfaction levels with the help of socio economic status of farmers and found that ninety farmers are aware about crop insurance through their loan accounts[7].
These above papers and dissertations stating that
1) Agriculture Insurance and National agriculture Insurance Scheme in various aspects and expressed their opinions on it.
2) Crop loans and production output and one who focus on awareness levels of crop insurance.
This present research "Dissuade of Crop Insurance in the state of telangana" was not covered in any early reports. To cover that have undergone for study in various sources. Primary study can come to know that farmers in telangana state were not aware about crop insurance.

III. OBJECTIVES OF RESEARCH
Mainly the present research has the following objectives
1. To analyze the crop insurance patterns among loanee and non-loanee farmers in India.
2. To identify the status of Telangana farmers role in Agricultural crop insurance scheme.

ECONOMIC CHALLENGER

An International Journal

A STUDY ON THE IMPACT OF BEHAVIORAL FACTORS ON INDIVIDUAL INVESTORS CONCERNING THE INDIAN STOCK MARKET

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ABSTRACT

Behavioral Finance is becoming an integral part of the decision-making process. The primary objective of an investment is to make money. In the past, people used to invest on the basis of performance, market timing, forecasting, and so on. These methods received average returns. It was identified that it is caused by some fundamental mistakes in the decision-making process, i.e., irrational investment decisions. As a result, a new paradigm known as Behavioral Finance has been developed. Behavioral Finance is an emerging area that studies how psychological factors affect decision making under uncertainty. This is an attempt made to find the influence of certain identified behavioral finance concepts (or biases), namely, Overconfidence, Representativeness, Herding and Heuristics on the decision making process of individual investors in the Indian Stock Market.

KEYWORDS: Employer branding, recruitment advertising, service employees

INTRODUCTION

Investors form the backbone of the capital market. A developing economy, like India, needs a growing amount of savings to flow to corporate enterprises. The level of equity market participation of the retail investors has been increasing over the past few years. Investment is the flow of capital which is used for productive purposes. There is a great emphasis on investment for being the primary instrument of economic growth and development for a country.

In the present scenario, investment is made easy because of the current technology. The concept of investing is trendy. Therefore, people make illogical decisions on knowledge or information of a particular investment object. These decisions are explained through several behavioral finance theories. The behavioral factors influence individual investors.

NEED AND SIGNIFICANCE OF THE STUDY:

Many factors influence investment decisions.

Our Heritage

An Empirical Study on the effects of Country of Origin on consumers' decision to purchase wrist watches

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Abstract

The study aims to identify the factors influencing consumer purchase of wrist watches and more precisely, the influence of Country of origin on consumers' purchasing decision has also been examined. The sample of the study constitutes 450 respondents who have either used or currently using branded wrist watches. Factor analysis and paired t-test has been employed to analyze the collected data. Findings of the study suggest that consumers do perceive the quality of branded wrist watches differently but they don't have the knowledge about the real Country of Origin of branded wrist watches.

Keywords: Country of Origin (COO), Indian Brand, Foreign Brand, Purchase Intention, Wrist Watch.

1. Introduction

Research on "Country of Origin-effects" has been recognized as one of the major research areas within consumer behavior and international marketing literature (Bloemer, Brijs, Kasper, 2009) Subsequently, the influence of Country of Origin on consumers' purchase decision is the most discussed theme in marketing discipline (Godey et al., 2012) COO has been regarded as one product- extrinsic cues (such as brand name, price, warranty, store reputation) that help the companies to enter into the global markets (Bilkey and Nes, 1982) Consumers does assess all the intrinsic product characteristics (such as design, material, taste and performance) albeit the impact of extrinsic product cues is more on consumers purchase attention (Rezvani et al., 2012) Overall, COO effect refers to a specific marketing process i.e. consumers self-consciously integrates COO-cue as an evaluative criteria in forming their attitude towards a brand. The processing of such a COO-cue can be cognitive, affective or conative in nature

Our Heritage

Customer Experience Analysis for Social Media Marketing and Fashion Apps in Fashion Industry

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Abstract

Social media has brought various amendments in terms of diversities, innovations, connectedness in fashion industry. Fashion has turned to be more interactive than ever before due to active role of social media and fashion apps for bringing latest fashion trends to the doors of customers sitting at different corners around the globe. The present study is aimed to assess the contribution of social media in marketing fashion apps and letting the latest fashion reach to the customers at large. To gain insight about the customers' experiences and views about how social media is assisting them to be informed about ongoing fashion craze and making online purchase decisions for fashion products, primary data is collected from 300 respondents residing in Chandigarh. It is ascertained that Instagram is the highly preferred social media platform by customers for knowing latest fashion followed by Television. In addition, it is also confirmed that Myntra and Flipkart are most used fashion apps for online purchasing of fashion products. Customers are mostly buying apparels online. Customers consider ratings and reviews of products before taking online purchase decisions. Customers do use more than 2 fashion apps for making selective buy decisions.

Key words: Customers, Fashion, Fashion Apps, Online purchase, Social Media.

1. Introduction

The growth of social media in 21st century has become one of the major phenomena. Its evolvement and progress has influenced each and every aspect of individual's life virtually. Being competent to reach to masses and enabling instant two-way communication between the customers and companies that assist the companies to build & grow relationships with their customers, social media has become a prime choice for any business for marketing its products and services. Social media is regarded as one of primary source of information for individuals and businesses are taking the most benefit out of it by modifying their marketing strategies to make their products effectively present on social media for

Women Empowerment in India

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Abstract

Women empowerment is a strategy for overall economic and social development. Women empowerment is a multifaceted concept which extends to psychological, social, cultural, political and institutional spheres of women's lives. Mainstreaming and women's empowerment is central to human development. In this paper an attempt has been made to analyze the social, political and economic empowerment of women and the government initiatives for women empowerment. For the purpose of the study, secondary source data has been used since the study is macro in nature. In achieving women empowerment, many government and non-government organizations at national as well as state levels organized various programmes and have inspired them towards development. The Government of India has been proactively engaged in looking into various issues of uplifting the status of women through various legislations and programmes. The main task undertaken during the Eleventh Five Year Plan was to ensure that women are at the centre – stage of all the activities – economic, social and political. Over the years there have been efforts made to socially, economically and politically empower women but as a result of the lack of synergy of coordination between these activities, the outcomes could never be completely satisfactory. However, there still exists a wide gap between the goals enunciated in the constitution, legislation, policies, plans, programmes, and related mechanism on the one hand and the situational reality of the status of women in India, on the other. Wherever there are gaps in policies and programmes, women specific interventions would be undertaken to bridge these. The remedy for empowerment lies in a strong determination among every man that every woman in this country should be honoured. It requires involvement of every segment of society, government, laws, political parties, judiciary, social reformers, religious leaders and media. Only then empowerment in its true meaning will be realized.

Keywords: *Women Empowerment, Development, social, economic, political, Government*

A STUDY ON FINANCIAL PERFORMANCE EVALUATION USING DUPONT ANALYSIS IN SELECT AUTOMOBILE COMPANIES

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Abstract

The purpose of research is to study the performance evaluation using DuPont analysis in selected automobile companies through measuring Return on Common Stockholder's Equity (ROE).The present analysis evaluates how well a company is operating and how profit is earned relative to sales, total assets etc. The study was conducted on 10 Automobile companies listed in the NSE and period of the study was 2013 to 2017. This study is mainly based on secondary data. Data was obtained from published annual financial statements. The present study was analyzed using equity multiplier, net profit margin, asset turnover ratio to calculate return on equity. ROE, ROA, ROCE is the most comprehensive measure of profitability of a firm. Correlation and regression analysis is done to know whether the relationship among the above variables exists or not and to know the impact of ROA and EM on ROE. Results revealed that there is a positive relationship among all the variables except EM and there is significance difference exists in the financial performance of selected companies with respect to Return on equity and Return on Assets.

Keywords - ROE, ROA, ROCE, Dupont analysis, Netprofit margin, Asset turnover ratio, Equity multiplier.

LEAN MANAGEMENT IN INDIAN HEALTH CARE: AN EXPLORATORY STUDY

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ABSTRACT

Facing intense competition and the inability to meet an increasingly growing demand, makes healthcare organizations to seek structural and organizational changes in order to achieve performance improvement. Lean Healthcare is nothing but getting the concepts of lean management and implementing them in the processes of healthcare to improve quality and eliminate errors, wastage and it has been a growing alternative in terms of quality pursuit, being based on patient's needs and saving resources that can bring positive results concerning quality of care and costs. Looking to adopt Lean philosophy in health services, many organizations have adopted different approaches and improvement strategies. There are a large variety of tools and techniques which can be used by health organizations in this regard. The study found that there is an association between the different services provided, their quality and the patients satisfaction level. This research mainly focuses on knowing the extent of awareness and implementation of lean management principles of hospital personnel and to assess quality in various services provided to the patients by the hospitals.

KEYWORDS: Extent of awareness on lean practices, Lean Healthcare, Lean Methodology, Quality assessment, Lean principles of hospitals.

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The Effect of Liquidity And Leverage on Profitability of Select IT Companies

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ABSTRACT - The organizations performance is measured on liquidity and capital structure variables. Thus for may finance managers these variables are of at most concern. This paper attempts to understand the relationship between liquidity and profitability and also attempts to examine the impact of financial leverage and liquidity on the performance of the organization. The study is confined to IT companies in general and select five IT firms in particular. The tools used for the study are descriptive statistics, correlation to establish the relationship between liquidity and profitability and regression analysis to understand the impact of leverage on the performance of the firm.This study will help for further study and develop cumulative study in this area.

KEYWORDS: Capital structure, financial performance, IT Companies, Leverage, Liquidity, Profitability.

I. INTRODUCTION

The main objective of any finance manager in the organization is to maximize the shareholders wealth. This objective can be achieved with a right tradeoff between the functions of finance, mainly the investment decision and financing decision.

The growth of any organization can be evidenced based on its debt-equity mix, which is also termed as financial leverage. The use of leverage of the firm decides the capital structure of the firm. Thus, leverage can be understood as the fundamental decision for any organization, to maximize the stakeholders returns and also to have an impact on the ability to deal with the competitors in the industry. Proper use of leverage also incorporates the risk philosophy. For any business it is very important to choose the right mix of debt and equity to achieve optimum capital structure which would result in minimizing the overall cost capital and maximizing the shareholders wealth. Maintaining adequate working capital is always needed for any business to avoid problems like production delays, delay in payments and purchases and unable to exploit favorable market opportunities etc. on the other hand higher liquidity leads to blockage of funds in various forms like inventories, bills receivables etc. thus, in this study an attempt is made to understand the liquidity position of the select IT companies through liquidity ratios.

Organizations performance can be measured based on the growth and its profitability. To analyze the profitability of the select IT companies financial statement analysis is done as it helps the firm to establish the relationship among various components of financial statements.

II. LITERATURE REVIEW

Y.V.Reddy and Parab Narayan (2018) analysed the relationship between liquidity and profitability, financial leverage and profitability and also the study analysed an effect of financial leverage and liquidity on the financial performance of select pharmaceutical companies for the period of 2006-07 to 2015-16. The study result shows that the liquidity of the companies has significant impact on firm's performance which is effect the ongoing ability to pay financial obligations and effect the firm's capital structure too.

Dr.J.Michael Sammanasu and Dr.A.Pappurajan (2017) investigated that the impact of leverage on the profitability of the firms performance. It aims to portray how the earning capacities of the firms are influenced by the fixed operating charges and the fixed financial charges. This study reveals that selected steel companies are considered for investigation and hypothesis are examined with the help of Analysis of Variance (ANOVA) and t-test. The results suggested that the leverage and profitability are related and the leverage is having a significant impact on the profitability of the firms performance.

Mohammad Alfurqan Dabiri, Rosylin Mohd Yusof and Norazlina Abd Wahab (2017) analysed that there is a relationship between liquidity and profitability and an effect of liquidity on profitability of five selected Islamic banks in the United Kingdom for the period of 2005-2016. The study reveals that liquidity has negative correlation and significant impact on selected companies' profitability in short and long runs. The study suggests that the apex bank (Bank of England) should guarantee close regulation and monitoring of Islamic banks' potency and level of liquidity in an effort to lighten and reinforce the financial sector of the country's economy.

Syed Azhar (2015) studied that the effect of liquidity position and management efficiency on profitability of respective power distribution companies. The study reveals that debtor turnover ratio, collection efficiency

A Comparative Study on Consumer Buying Behaviour Between Berger Paints and Asian Paints

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ABSTRACT - Consumer behavior is the study of individuals, groups or organizations. It is how the customer thinks while buying a product or service. In rapidly growing competition in the market the study of consumer behavior is very important. The study of consumers help firms and organizations   improve their marketing strategies by understanding the customer taste and preference. The main aim of the project is to study and analyze the consumer behavior towards Berger Paints and Asian Paints. Consumer buying behavior is analyzed in this process through primary and secondary data with a clear objective of understanding the consumer behavior between Berger Paints and Asian Paints products/services. The primary data is collected through survey technique and field work by interviewing the consumers i.e. products which are used by general public. The secondary data is collected through companies past data and websites. The statistical analysis was based on one hundred respondents from various functional areas and from various regions of Hyderabad and Secunderabad. The survey is done through the questionnaire; the questionnaires have been designed to obtain the result information from the consumers keeping in mind the objectives of the study. The results reveal the expectations and the satisfaction of the consumers towards Berger Paints.

Key words: *Consumer Behavior, Competition, Marketing Strategies, Paint Industry, expectations, Satisfaction*

I.   INTRODUCTION

The behavior of the consumer is basically influenced by what he/she is looking for in the product. The company must try to learn more about the consumer's behavior. Who are the buyers? How do they buy? Why do they buy? The company that really spends time and resources in understanding consumer and their response to different product features, price and advertising appeals has a great advantage over its competitors. Consumer purchases are strongly influenced by cultural, social, personal and psychological characteristics. Although the market cannot control them, they must be taken into account. Paint industry is one of the booming sectors of the Indian economy which has experienced outstanding growth in the past decade.

Paint industry is important contributors to Indian Gross Domestic Price and is also the second largest sector in Indian paint industry.

II.   INDUSTRY PROFILE

➢ The paint industry is expected to grow at 12%-13% annually over the next 5 years from Rs.280 billion in FY13 to around Rs.500 billion by FY18. FY14 was a challenging year for the industry as a whole due to subdued demand across key sectors and rising inflation.

➢ The unorganized sector controls around 35% of the paint market, with the organized sector accounting for the balance. In the unorganized segment, there are about 2000 units having small and medium sized paint manufacturing plants. Top organized players include Asian Paints, Kansai nerolac, Berger Paints and ISI.

Demand from paints come from two broad categories:

a) Decorative: Major segments in decorative include exterior wall paints, interior wall paints, wood finishes and enamel and ancillary products such as primers, putties etc. Decorative paints account for over 77% of the overall paint market in India.

b) Industrial: Three main segments of the industrial sector include automotive coatings, powder coatings and protective coatings.

➢ The market size of the paint industry in India is estimated at around Rs.290 billion. Industry players expect close to 12%growth in business volume and 10%-12% rise in sales inFY15.

➢ The market for paints in India is expected to grow at 1.5 to 2times GDP in the next 5 years. With GDP growth expected tobe between 5%-6% levels, the top three

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A Study on Volatility of Initial Public Offering on Listing Day in National Stock Exchange

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Abstract

Initial Public Offer is a way for a company to raise capital from public for its future projects and gets listed in Stock Exchanges. On listed day it may be under performed or over performed. In last five years 113 companies were listed in stock market. However, only 68 IPOs performed well and given good returns to their investors by the evening of the listing day. This present research considered this point as a research scope with existing literature. Taken last fivers data for the research and out of 113, 100 companies considered for research due to non-availability of data hence it is considered as census method adopted. By using Market adjusted excess return, descriptive statistics and Co- relation tools researcher found that there is positive correlation between company's fundamentals and performance in IPO market.

.**Keywords:** Initial Public offer, Listing, Performance, Return.

INTRODUCTION

IPO or Initial Public Offer is a way for a company to raise money from investors for its future projects and get listed to Stock Exchange or An Initial Public Offer (IPO) is the selling of securities to the public in the primary stock market.

IPOs are issued by smaller, younger companies seeking capital to expand, as well as by large private companies are looking to expand & become publicly traded. When a company lists its securities on a public exchange, the money paid by investors for the newly-issued shares goes directly to the company (in contrast to a later trade of shares on the exchange, where the money passes between investors). An IPO, therefore, allows a company to tap a wide pool of investors to provide it with capital for future growth, repayment of debt or working capital.

IPO can be used as both a financing strategy and an exit strategy. In a financing strategy, the main purpose of the IPO is to raise funds for the company. In an exit strategy for existing investors, IPOs may be used to offload equity holdings to the public through a public issue. A company selling common shares is never required to repay the capital to investors. Once a company is listed, it is able to issue additional common shares via a secondary offering, thereby again providing itself with capital for expansion without incurring any debt. This ability to quickly raise large amounts of capital from the market is a key reason many companies seek to go public.

PRELIMINARIES

2.1 Research problem:

One of the main problem for the small investor is to take investment decision with such a limited capital. And small investors don't have the expertise knowledge. So with in the short duration of time with less capital small investor can invest their money and avail the opportunity of high return than the traditional one. This study was undertaken mainly to analyze the performance of IPO's which is listed in the NSE of Indian Stock market during the selected period.