3.4.3.1: Number of research papers in the Journals notified on UGC website during the last five years

Index Page

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Chaitanya Bharathi Institute of Technology
(Autonomous)
Gandipet, Hyderabad-500 075.

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ani ay [1] · Csósi Eji n [2]

Received: 31 July 2017 / Accepted: 3 September 2018 / Published online: 15 October 2018

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DEVELOPMENT OF SELF-CURING CONCRETE USING POLYETHYLENE GLYCOL AS INTERNAL CURING AGENT

M V Jagannadha Kumar
Research Scholar in Civil Engineering, JNTUH CEH

K Jagannadha Rao
Professor of Civil Engineering, CBIT, Hyderabad

B Dean Kumar
Professor of Civil Engineering, JNTUH CEH, Hyderabad

V Srinivasa Reddy
Professor of Civil Engineering, GRIET, Hyderabad

ABSTRACT

Self-curing or internal curing is a process in which moisture present in the concrete is preserved for more effective hydration of cement and reduced self-desiccation. In this paper, Self-curing concrete of M20, M40 and M60 grades are developed using optimized dosage of polyethylene glycol as internal curing agent. Compressive, split-tensile and flexural strength properties of self-curing concrete mixes are evaluated and exhaustive cost analysis is made on internally and externally cured concrete for economic feasibility. The optimum dosage of polyethylene glycol (PEG) (expressed in percentage by weight of cement) for M20, M40 and M60 grades self-curing concrete are 1%, 0.5% and 0.5% respectively. There is a significant increase of about 5-20% in the compressive, split-tensile and flexural strength properties of self-curing concrete mixes when compared to normal externally cured concrete mixes for all the grades considered for study. This improvement may be attributed to the continuation of the hydration process as a result of continuous availability of water. This resulting in, lower voids and pores, and greater bond force between the cement paste and aggregate. It was found that there is significant cost saving ranging from Rs. 2500 -3000 per cubic meter of concrete if internally cured.

Key words: Self-Curing Concrete, Internal Curing, Polyethylene Glycol, Self-Desiccation, Cost Analysis.

Experimental investigation on Utilization of RCA in Low, Medium and High Strength Self Compacting Concrete

Srinivas Vasam[1], **K. Jagannadha Rao**[2*] **and M. V. Seshagiri Rao**[3]

[1] Research scholar, Department of Civil Engineering - JNTUH-Hyderabad
[2] Professor, Department of Civil Engineering, CBIT, Hyderabad, India
[3] Department of Civil Engineering, CVR College of Engineering, Hyderabad, India
* Email: kjagannadharao@yahoo.com

Abstract. Self Compacting Concrete (SCC), owing to its advantages, is now a buzz word in the present construction industry. The application of recycled aggregates in concrete mixes is widely investigated. The present investigation focuses on the use of RCA in SCC. The variables of study include grade of concrete (Normal, standard grade and high strength), RCA content (0 to 100%) and age of concrete (7 and 28 days). The parameters of investigation are fresh and hardened state properties, viz. compressive, split tensile and flexural strengths. The mix design was carried out based on modified Nan Su method. The fresh state properties were satisfied for all RCA contents in all the three grades of concretes tested. The test results were encouraging and the target mean strength could be attained in M30 concrete even with 50% RCA as replacement of natural aggregate. However, a reduction in strength was observed as the grade of concrete increased. Optimum RCA content was arrived at based on the strength for different grades of concretes tested.

1. Introduction

The experimental investigations on the recycling of Construction and Demolition Wastes have long been accepted to have the possibility to conserve natural resources and to decrease energy used in production. In some nations it is a standard substitute for both construction and maintenance, particularly where there is a scarcity of construction aggregate. Researches on Construction and Demolished Waste (CDW) reveal that the behaviour of structural concrete with recycled aggregate is comparable to that of the concrete with conventional natural aggregate Manzi et al. [1,2] (2013) The use of such materials solves the disposal problem, apart from reducing the cost of construction materials.

The Indian construction industry today is amongst the five largest in the world and the supply of natural aggregate has also emerged as a problem in some of the metropolis in India. The requirement of natural aggregates is not only required to fulfil the demand for the upcoming future projects in India but also the needs of extensive repairs or replacements required for the existing infrastructure. The future of construction industry sector seems to be in dark with the likely shortage of natural resources as seen today. Several market constraints and technical challenges exist when developing markets for new products. Notable among these barriers is consumer uncertainty about the quality and consistency of products due to the lack of practical performance and engineering data on recycled materials A.R.Khaloo. et al. [3-5] (1996). Such data is necessary to assist with the development of appropriate design codes to guide product specification and performance information on recycled materials.

Bond Strength of HYSD Bars and SCC with and without Recycled Aggregate-An Experimental Study

K. JaganadhaRao[1], S. Vasam[2] and M. V. SeshagiriRao[3]

[1] Department of Civil Engineering, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad -75, India
[2] Research scholar, Department of Civil Engineering, J N T University, Hyderabad – 85, India
[3] Department of Civil Engineering, CVR College of Engineering, Hyderabad, India
Email: kjagannadharao@yahoo.com

Abstract. Self Compacting Concrete (SCC) has become inevitable in the current scenario of construction of large and complex structures with heavy reinforcement and complicated shapes. Using normal concrete in such situation may often result in inadequate compaction, affecting performance and long-term durability of structures. In addition, the use of Recycled Concrete Aggregate (RCA) is gaining importance throughout the globe due to the depleting sources of natural aggregate and disposal problem of demolished waste. There is a little work done on the behaviour of SCC with RCA. Therefore, a comprehensive experimental investigation on bond strength and modes of failure of Self Compacting Concrete (SCC) with and without Recycled Concrete Aggregate (RCA) was carried out and the results are presented. The variables studied include grade of concrete (M20, M40 and M60), Percentage of RCA (0% to 100%), diameter of bar (10, 12 and 16) and percentage embedment length. All specimens were tested by conducting pull out test on UTM after 28 days of curing. The bond strength was found to vary with the increase in diameter and the failure mode was observed to change from rod pull out to splitting or rod fracture with increase in percentage of embedment length. The experimental results were compared with the theoretical bond strengths using the authors' formula and the formulae suggested by earlier researchers.

1. Introduction

The concept of sustainability is widely used in the construction industry due to the concern about the future of the planet as this industry consumes huge quantities of natural resources. There has been considerable research carried out on the use of recycled aggregates in concrete over the past 20 years, and this has grown extensively over the past five years as industry and Government have recognised the need for greater sustainability in construction. Research has shown that coarse recycled aggregates can be used in concrete up to a compressive strength of 80 MPa although there is a loss in strength when recycled aggregates are used as a direct replacement of natural aggregate. However, most researchers report that a certain proportion of coarse recycled aggregates (usually in the range 20-30% by mass of coarse aggregate) can be added as partial replacement to natural aggregate without affecting performance. The reason for the loss in strength is usually associated with the weaker interfacial transition zone between aggregate and mortar, due to recycled aggregates having a coat of weak mortar already attached which raises the porosity of the concrete. In general, the flexural strength and modulus of elasticity of recycled aggregate concrete have been reported to be proportional to the loss of compressive strength.

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A STUDY ON PROPERTIES OF HIGH STRENGTH RECYCLED AGGREGATE CONCRETE WITH SYNTHETIC FIBRES

K.Jagannadha Rao[1] & M.V.S.S.Sastri[2]

Abstract Recycled concrete aggregates (RCA) are crushed, graded inorganic particles processed from the materials of concrete demolition debris. The aim of this research work is to study the behavior, in fresh and hardened states, of high strength structural concrete with recycled aggregates and synthetic fibres. The scope of this paper is to compare fresh and hardened state properties of high strength concrete by using various proportions of recycled coarse aggregates (0, 50% and 100% replacement of natural aggregates) along with PP fibres (0, 0.2, 0.3 and 0.4% by volume of concrete). The parameters of investigation include tests on workability, compressive, flexural and indirect tensile strengths, and modulus of elasticity. It is observed that the workability of concrete considerably reduced with the increasing quantities of recycled aggregate and polypropylene fibres. The results showed a gradual decrease in compressive strength, tensile strength and secant modulus of elasticity as the percentage of recycled aggregate used in the concrete mix increased.
Keywords: High Strength Concrete, Recycled Concrete Aggregate, Polypropylene Fibres, Mechanical Properties.

1. INTRODUCTION

Providing shelter to its subjects is the fundamental duty of all governments which requires several materials such as concrete, steel, brick, stone and so on. However, the cement concrete remains the main construction material and for its suitability and adaptability concerning the changing environment. This widely used material must also be such that it can conserve resources, protect the environment, economize and lead to proper utilization of energy and major emphasis must be laid on the use of wastes and byproducts in cement and concrete. The utilization of recycled aggregate is particularly very promising as 75 percent of concrete is made of aggregates. In that case, the enormous quantities of demolished concrete are available at various construction sites, which are now posing a serious problem of disposal in densely populated urban areas. This can easily be done by recycling the aggregate. Research & Development activities have been taken up all over the world for proving its feasibility, economic viability and cost-effectiveness.

The extensive research on Recycled Concrete Aggregate (RCA) has started from the year 1945 in various parts of the world after World War II but in a fragmented manner. The first effort has been made by Nixon (1978)[1] who compiled all the works on recycled aggregate carried out between 1945-1977 and prepared a state-of-the-art report while concluding that some researchers have examined the basic properties of concrete in which the aggregate is the product of crushing another concrete. A comprehensive state-of-the-art document on the recycled aggregate concrete has been presented by Hansen et al. (1986)[2] in which detailed analysis of data has been made, leading towards the preparation of guidelines for production and utilisation of RCA. RILEM technical committee 121-DRC[3] has given broad guidelines for the utilisation of RCA. Several researchers concluded [4, 5] that RCA can be used for normal strength concrete. Limbachiya et al.(2000)[6] concluded that RCA could also be utilised in high strength concrete and proper mix proportioning is the key to achieve strong and durable concrete. Though concrete lends itself to a variety of innovative designs, it suffers from several drawbacks that affect quality constructions such as Lack of toughness and ductility, Flexural strength limitation, Low abrasion/wear resistance, Inherent microcracks and Limited impact resistance.

To overcome above defects addition of Fibre to concrete is one of the solutions. Correct quantities and the right size of fibres when incorporated into conventional concrete substantially add to the strength when compared with concrete products made without fibre. FRC is also tougher and more resistant to impact in comparison with plain concrete. FRC conventionally uses steel fibre, and a lot of research work is being carried out on synthetic fibres also such as polyester, polypropylene. Synthetic fibre reinforced concrete (SNFRC) makes use of man-made fibres that are derived from organic polymers like acrylic, aramid, carbon, nylon, polyester, polythene and polypropylene fibres which have been tried as reinforcing material in Portland cement concrete. Since the use of PPFRC reduces water penetration and permeability by more than 50% with respect to control concrete, IS 2645 recommends it as waterproofing admixture. However, the basic attributes of PPFRC are a reduction in shrinkage cracks and improvement in elastic properties of concrete.

Dave and Desai(2007)[7] found the addition of fibres produce non linear curve after first crack and reaches its peak at the ultimate strength of maximum sustainable static load and also the intricate matrix formed by huge number of fibres increase the compressive strength of a desired mix of concrete. Polymeric fibres having relatively low modulus of elasticity which

[1] Professor, Dept. of Civil Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad, India.
[2] Asssociate Professor, Dept. of Civil Engineering, Vasavi College of Engineering, Hyderabad, India.

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REVIEW ON THE ADVANCEMENTS TO ADDITIVE MANUFACTURING-4D AND 5D PRINTING

P. RAVINDER REDDY[1] & P. ANJANI DEVI[2]

[1]*Professor & Principal, Chaitanya Bharati Institute of Technology, Hyderabad, Telangana, India*

[2]*Assistant Professor, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India*

ABSTRACT

3D printing is established additive manufacturing technology in the Industry for quite a time. While the Additive Manufacturing industry is still discovering new applications, new materials, and new 3D printers, research is on for other technologies. 4D printing was started a year ago and recently 5D printing is being thought about and experimented. 4D printing has the ability to change the shape of 3D printed objects over time, which is the 4th dimension. 5D printing has the capability to print in 5 different axes thus printing the layers in any required layers and curves.

KEYWORDS: 4D Printing; 5D Printing & Additive Manufacturing

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Original Article

INTRODUCTION

4D printing is referred to as 3D printing transforming over time. Thus 4th dimension is added. So, the big break through about 4D printing over 3D printing is its ability to change shape over time. Itis the process through which a 3D printed object transforms itself into another structure over the influence of external energy input as temperature, light or other environmental stimuli. 4D printing relies on different kinds of materials and 3D models. The technology uses programmable materials that change their function when hot water, light or heat is added to the mix. The input to the 4D printing is a "smart material" that has thermo mechanical properties with other material properties and attributes that allow for shape change.

5D printing allows objects to be printed from 5 axes instead of from one point upwards. Objects in 5d printing are printed in various axes/angles unlike in 3D printing where it prints single direction. The printer head moves around from 5 different angles while printing as the plateau on which the object gets printed also moves. These movements make the printer head to print from different angles/direction to print the layers any required planes and curves, which is not achieved in 3D printing. This enables the printer head to follow the object's shape and outline. Instead of following the straight path on a static plateau, the printer creates curved layers instead of flat layers. These curved layers make objects strong which have a complex design.

4D PRINTING

This technology is part of the project of MIT Self-assembly Lab. The purpose of this project is to combine technology and design to invent self-assembly and programmable material technologies aiming at reimagining construction, manufacturing, product assembly, and performance.

Evaluation of Mechanical Properties of Tailor Welded Sheet Metal Blanks

[1]K.C.Sabitha, [2]Dr.P.Ravinder Reddy, [3]Dr.A.Krishnaiah, [4]Dr.R.Uday Kumar

[1]Assistant Professor, Department of Mechanical Engineering, Mahatma Gandhi Institute of Technology, Gandipet, Hyderabad, 500075,India.

[2]Professor &Head, Department of Mechanical Engineering, Chaitanya Bharathi Institute of Technolgy, Gandipet, Hydrabad,5000075,India .

[3]Professor& Vice Principal, Department of Mechanical Engineering, University College of Engineering, OU, Hyderabad,5000075,India.

[4]Associate Professor, Department of Mechanical Engineering, Mahatma Gandhi Institute of Technology, Gandipet, Hyderabad, 500075,India.

Corresponding author E-mail : u_kumar2003@yahoo.co.in

Abstract. A tailor welded blank consist of two or more sheet metals which are welded together prior to forming. The sheets which are welded together may be different in size, shape and even in thickness also. The blanks may be also differing in sense of coating and material grade also. This different blanks are welded together to form in to one continuous blank. In industries since last long years the materials which are used for preparing tailor welded blanks in general are combinations of mild steel to stainless steel with different grades. Also the common materials which are used for making tailor welded blanks are generally aluminium alloys with different grades or it may be combination of aluminium and steel alloy sheets. Most tailor welded blanks today embody a multiple thickness design in order to eliminate the use of extra reinforcing components. The advantages of using tailor welded blanks are numerous, they ensure that the components are light, stronger, and provide required functionality at lower cost than parts made from monolithic pressed sheets, as well as improving structural integrity, safety and corrosion resistance in specific areas. In an automotive application, Tailor welded blanks eliminate the need for reinforcement, resulting in an overall reduction in vehicle body weight. The use of different strength or thickness in a single part can simplify the whole structure of a vehicle. Low car weight means improved fuel economy that is very important to today's energy consumption. Decrease of automobile parts number. This paper presents the tailor welded blanks of steel alloys tensile specimens are prepared and tested through uniaxial tensile test. Determined mechanical properties of tailor welded sheet metal blanks and also studies done on those properties.
Keywords : Tailor welded blanks, Mechanical properties, TIG welding.

1. Introduction

The material selection criteria depends on the results of tensile tests for applications of engineering. The specifications of materials are included in tensile properties for ensure the quality of products. The study of behavior of material under varying loads apart from uni-axial tension(1-5).The primary concern of material is generally strength of materials. The strength is measured in terms of stress, it is caused to plastic deformation of material. The ductility also another important parameter, which is study of material

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Prediction of angular error in wire-EDM taper cutting of AISI D2 tool steel by RSM approach

K.L.Uday Kiran[a]*, P.Sarath[a], K.Saraswathamma[a], G.Chandra Mohan Reddy[b]

[a]*Department of Mechanical Engineering, Osmania University, Hyderabad, TS, 500007, India*
[b]*Department of Mechanical Engineering, CBIT, Gandipet, Hyderabad, TS, 500075, India*

Abstract

Taper-cutting is one of the most important application of wire electrical discharge machining (WEDM) process used for producing precise complex geometries with inclined surfaces in hard material parts that are extremely difficult to machine by conventional machining process. The wire is subjected to deformation during taper cutting operation leading to deviations in the angular dimensions and loss of tolerances in machined parts. For the correction of error time consuming experimental trial-and-error methods are currently adopted by WEDM machine manufacturers. So, to reduce the experimental load experiments were carried out to find the effect of process parameters such as taper angle, geometrical thickness and servo voltage on response variables such as angular error and cutting speed on AISI D2 tool steel using statistical design of experiments. The experiments were designed using Response Surface Methodology (RSM) – Central Composite design (CCD) involving three variables with five levels. An attempt has been made to develop regression model for relating the responses to the process parameters. Separate analysis of variance (ANOVA) is used to analyze the effect of parameters and contribution of each parameter affecting the responses is calculated. Results show that part thickness and servo voltage are the most influencing variables in the study.

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Keywords: Wire EDM; Tolerances; Taper Cutting; Cutting Speed; Angular Error; Response Surface Methodology

1. Introduction

Wire electrical discharge machining (WEDM) is an important technology, which demands high-speed cutting and high-precision machining to realize productivity and improved accuracy for manufacturing geometrically complex and hard material parts that are extremely difficult to machine by the main stream machining processes.

* K.L.Uday Kiran. Tel.: +91-9959738537.
E-mail address: ukiran1703@gmail.com

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Research paper

Multi-objective optimization of WEDM process parameters for taper cutting of AISI D2 tool steel

K. L. Uday Kiran [1] *, T Nagaveni [1], K. Saraswathamma [1], AMK. Prasad [1], G. Chandra Mohan Reddy [2]

[1] *Department of Mechanical Engineering, Osmania University, Hyderabad, TS, 500007, India*
[2] *Department of Mechanical Engineering, CBIT, Gandipet, Hyderabad, TS, 500075, India*
**Corresponding author E-mail: ukiran1703@gmail.com*

Abstract

Wire electrical discharge machining (WEDM) process is one of the most popular method for the producing complex geometries in hard and wear resistant materials such as those used in tooling industry. This taper cutting involves in making of inclined surface, and it is particularly significant in the manufacturing of tooling that requires draft angles. In the present paper, experiments were conducted in order to find the effect of process parame- ters such as taper angle, geometrical thickness and servo voltage on response variables such as angular error and cutting speed on AISI D2 tool steel using statistical design of experiments. The experiments were planned using Central Composite design (CCD) which is part of Response Surface Methodology (RSM) – involving three variables with five levels. Multi objective optimization was conducted for maximizing the Cutting speed and minimizing the angular error using genetic algorithm. The optimization procedure leads to creation of non-dominated optimal points which gave an insight regarding the optimal operating conditions of the process.

Keywords: *Wire EDM; Taper Cutting; Cutting Speed; Angular Error; Response Surface Methodology; Genetic Algorithm.*

1. Introduction

Wire electrical discharge machining (WEDM) has been found to be an extremely potential electro-thermal process in the field of conduc- tive material machining which is employed for the parts demanding higher accuracy levels with varying hardness or complex shapes. Ta- per cutting is one of the most important applications of WEDM pro- cess that involves the generation of inclined surfaces and possesses significant bearing in manufacturing of tooling requiring taper or draft angles. The taper angle is achieved by applying a relative dis- placement between the upper and lower guides of the wire as shown in Fig. 1. The maximum angle that can be cut depends upon part thickness, but values about 30° can be easily achieved [2].

The main factors contributing to the geometrical inaccuracy of the WEDMed part are the various process forces acting on the wire caus- ing it to depart for the programmed path [3]. The problem of taper cutting was first time proposed by Kinoshita et al. [4] who developed a linear model for wire deformation neglecting the forces produced during the process. Computer simulation software for the analysis of error in wire EDM taper-cutting was presented by Sanchez et al. [5]. Two models for the prediction of angular error in WEDM taper cut- ting ware developed by Plaza et al. (2009). Nayak & Mahapatra [6] adopted Multi response optimization approach to determine the op- timal process parameters in WEDM taper cutting process.

Since the wire is subjected to deformation in wire EDM taper cutting process, deviations are obtained in the inclination angle of machined parts. As a result, the machined part losses its precision. Hence, se- lection of the process parameters is a major issue in the field of taper cutting operation in WEDM. However, the traditional Taguchi meth- od cannot solve the multi-objective optimization problem. To over- come this limitation genetic algorithm is applied to simultaneously optimize the process parameters for minimizing angular error and maximizing cutting speed during taper cutting in WEDM.

The present work is focused on investigating the effect of various process parameters of WEDM such as taper angle, part thickness and servo volt- age (SV) on responses such as angular error (AE) and cutting speed (CS) in taper cutting of AISI D2 tool steel. Further, angular error (AE) and cutting speed (CS) were exposed to multiple objective optimization using genetic algorithm (GA) approach. RSM model aids in process under- standing while the Pareto optimal solutions generated from GA approach facilitates to identify optimal operating conditions.

2. Materials and method

Experiments were conducted on AISI D2 steel using Electronica Sprintcut WEDM and brass wire electrode of 0.25 mm diameter. Deionised water was used as a dielectric medium. The work pieces were prepared by cut- ting into the sizes as per the experimental plan as shown in Table 1 and 2 with 10mm width (w) and then grounded in order to get good finish. The lower and upper surfaces of the work parts are grounded, so that they can be used as a reference for measurement of the angle. Angular error (AE) and Cutting speed were studied for optimizing machining parameters of WEDM taper cutting process.

Angular measurements have been carried out on a Zeiss Prismo-5 model CNC Coordinate Measuring Machine. Two level full factorial design with 6 central runs and 6 axial runs leading to central composite rotatable de- sign was used to conduct experiments. Coded and actual levels of process parameters are presented in

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Parametric Analysis of Friction Stir Welding Process

Pavan kumar Thimmaraju[a]*, Krishnaiah Arkanti[a], and G.Chandra Mohan Reddy[b]

[a]*Department of Mechanical Engineering, Osmania University, Hyderabad, Telangana, 500007, India*
[b]*Department of Mechanical Engineering, C.B.I.T, Hyderabad, Telangana, 500075, India*

Abstract

In this paper a thermo- mechanical model is created for friction stir welding process using ANSYS APDL commands using FEA techniques is presented. Several characteristics of FSW are studied, including tool-work piece surface interaction, heat generation because of friction during the operating conditions of the FSW process, plastic deformation and plastic heat generation due to the non-linear nature of the materials used in finite element analysis. A nonlinear direct coupled-field analysis is performed, as thermal and mechanical behaviours during the friction stir welding process are mutually dependent and coupled together. ANSYS APDL macro is created in such a way that it can be used for multiple design variants and load parameters in order to perform the FSW study for multiple design variants. The proposed model is then utilised to carry out parametric studies to know the effect of various process parameters like welding speed, total rate of heat input and location of the clamping on the temperature distribution and residual stress in the work piece. With the data obtained from the simulated models, various observations are made by changing the input process parameters. A transient thermo mechanical analysis is performed using coupled field elements for different tool diameters and different sizes of the base plates that are to be welded using FSW.In this project FSW process is studied in various stages DWELL, PLUNGE and TRAVERSE by solving the finite element model in separate load cases. To avail the plastic heat bi-linear isotropic material properties are used. From the results obtained from this study, it is observed that the heat input, for making good welds, is mainly restricted and controlled by the lower bound of the temperature. Also it is found that keeping the clamping position closer to the weld is better in order to keep the peak residual stresses at a lower limit. Further, it is found that adopting nonlinear models resulted in a more realistic solution than the usage of linear models as a wide temperature range is used in the simulation process which is in general highly non-linear and wherein convergence becomes an important problem to be dealt with.

Keywords: Friction stir Welding,Parametric Analysis,FEM,Coupled Field Analysis

1. Introduction

Friction Stir Welding (FSW) is a non-fusion welding process unlike conventional joining process which are fusion in nature and is derivative of friction welding and produces good quality lap and butt joints[1].Friction stir welding is a joining process which is developed and patented by TWI Ltd,Cambridge,UK in 1991[2].The

*Pavan kumar Thimmaraju: 91 9866754820:
E-Mail: pavanaries@yahoo.com

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EXPERIMENTAL INVESTIGATION OF MAJOR AND MINOR STRAINS IN DIFFERENT REGIONS OF DEEP DRAWN CUPS

B. V. S. RAO[1], G. CHANDRA MOHAN REDDY[2] & G. KRISHNA MOHANA RAO[3]

[1,2]*Department of Mechanical Engineering, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, India*

[3]*Department of Mechanical Engineering, Jawaharlal Nehru Technological University, Hyderabad, India*

ABSTRACT

Drawing is one of the most important processes for forming sheet metal parts. It is used to manufacture parts in industries such as automobile, aerospace and home appliance, etc. The parts produced include cooking pans, kitchen sinks, automobile panels, gas tanks, fountain pen caps, etc. A deep drawn cup has different regions like, flange, corner radius, side walls and flat bottom. The values of stresses and strains vary throughout the cup (i.e in different regions). The objective of the present work is to perform an experimental investigation of major and minor strains in the different regions of deep drawn cups. In this work, the cups are drawn with different blank thickness and major strain and minor strain are measured in different regions of the cup. Also a comparison is made by drawing graphs between major strain(y axis) and minor strain (x axis) for cups drawn with different sheet thickness. By performing this study it will be possible to find out which region of the cup is strained maximum, hence where exactly fracture is likely to occur. Also, areas which are not stressed can be identified and in those areas, heat treatment is not necessary. It will also be possible to know which sheet thickness can take a maximum and minimum amount of stresses and strains. The material selected for this work is Brass. The diameter and heights of cups drawn are 200mm and 40mm respectively. The sheet thickness selected is 0.71, 0.8and 0.88mm. This work was carried out at Metal industries, Sanathnagar, New modern stone company, Hyderabad and metal forming lab of CBIT. The studies revealed that the die corner radius, region (neck) of the cup has maximum strain. Hence this region is the source for a fracture to take place.

KEYWORDS: Deep drawing, Blank thickness, Blanking, Electrochemical etching, Major strain & Minor strain

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INTRODUCTION

Deep drawing is one of the widely used sheet metal forming processes in the industries involved in mass production of cup-shaped components. During this process, a flat blank of sheet metal is shaped by the action of a punch forcing the metal into a die cavity. Deep drawn products, in modern industries usually have a complicated shape, so these have to undergo several successive operations to obtain a final desired shape. This process is used to manufacture complicated parts from sheet metal in many industries such as automobile, aerospace and home appliance. The parts produced include cooking pans, containers, sinks, automobile parts such as panels and gas tanks and so on. Figure 1 shows a schematic diagram of the deep drawing process.

The equipment for deep drawing processes involves a double action press, one for the blank holder and one for the punch. Both mechanical and hydraulic presses are used in manufacturing industry. The shape of a deep-drawn part is not just limited to a circle or square, but more complex contours are possible. However, as the complexity goes up, the manufacturing difficulties increase rapidly

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Influences of process parameters on weld strength of low carbon alloy steel in purged SAW

M. Sailender[a]*, G. ChandraMohan Reddy[b], S. Venkatesh[c]

[a]*Dept. of Mechanical Engineering, University College of Engineering, Osmania University, Hyderabad -500 007, India.*
[b]*Mahathma Gandhi Institute of Technology, Gandipet, Hyderabad -500 075, India.*
[c]*Mechanical Engineering Department, University College of Engineering, Osmania University, Hyderabad -500 007, India.*

Abstract

Submerged arc welding (SAW) is one of the most widely employed welding process in manufacturing industry due to its inherent advantages such as deep penetration, smooth bead and reliability with high quality. SAW is notable with a large number of process parameters, which act together in an intricate manner and influence the output performance, successively affects the weld quality. As quality is at high priority, it is important in selecting process parameters. In the present work, parametric optimization of main factors, viz. Open circuit voltage (OCV), wire feed rate (WFR), welding speed (WS) and nozzle to plate distance (NPD) and thus to study influences on weld strength. Taguchi's L_9 orthogonal array, at three levels, has been adopted to conduct experiments as part of design experiments. Experiments are conducted 'purging with CO_2 gas' in SAW to investigate the weld strength variations against the traditional SAW 'as weld' condition. The performance measure of control levels to select, are observed through S/N ratio, as the best cope with the noise to their effect. Analysis of variance (ANOVA) is calculated to make a note of significance parameter with contributions. The correlations are established between parameters and performance outputs using linear regression analysis. Mathematical models are developed and checked for their adequacy with the F-test, determined quantitatively and presented graphically. The direct and indirect effects of process parameters are presented in achieving desired weld quality. The models are validated through confirmation tests and predicted the results, are found within the limits.

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Keywords: Submerged Arc Welding, Design of Experiments, Regression Models, Analysis of Varince.

* M. Sailender. Tel.: +91-888-491-2646.
E-mail address: sailumamu@gmail.com

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Numerical Analysis On The Effect Of Various Parameters On Fracture Limit For Deep Drawn Cups ☆

B.V.S.Rao[1],G. Chandra Mohan Reddy[2],G. Krishna Mohana Rao[3], PVR.Ravindra Reddy[4]

1,2 & 4, Department of Mechanical Engineering, CBIT, Gandipet, Hyderabad-75.

Ph: 9290545750, email: balivadarao@gmail.com

3. Department of Mechanical Engineering, JNTU College of Engg., Hyderabad

Abstract

Deep drawing is the process of converting a blank into cup shaped articles like kitchen sinks, cooking pans, automobile panels, gas tanks, fountain pen caps etc. Wrinkles and fractures are the major defects in deep drawn products. Fracture is the separation or fragmentation of a solid body into two or more parts under the action of stress. In deep drawn cups tearing is usually an open crack in the vertical wall which occurs near the base due to high tensile stress that causes thinning and fracture of the metals at this location. During this process the punch force acting on the bottom of the cup is transferred to the side of the cup. The narrow ring of metal just above the bottom of the cup is subjected to plane strain condition. As a result, failure of the cup easily happens in this zone due to necking induced by the tensile stress, leading to tearing. This type of failure can also occur on the flange as the metal is pulled over the sharp die corner. In addition to this sharp corner on the punch could also cause fracture of the cup along the corner. The objective of this work is to predict the fracture limit of deep drawn cups. This would help in preventing rejections in deep drawing industry. This can be achieved by setting the blank holder force appropriately. Also it would save material and reduce the total cost. In this work numerical simulations are conducted by considering five different parameters namely punch radius, die radius, clearance, coefficient of friction and punch diameter using finite element explicit solver LSDYNA. Modeling of the set up is done using hyper mesh. In this work simulations are carried out as per L-27 orthogonal array suggested by Taguchi. A combination of finite element method and Taguchi analysis is used to determine the influence of process parameters on fracture limit in deep drawing process. During analysis the value of optimum BHF is arrived by performing a number of trial runs. Also Column effect method and plotting methods are used for finding out the most influencing parameters and their interactions respectively for analysis. The studies reveal that punch diameter is most significant parameter for deciding fracture limit followed by die corner radius and clearance. In addition to this regression analysis is carried out for developing an empirical model using Minitab 17 for predicting fracture limit.

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Keywords: deep drawing, blank holding force, wrinkling, Taguchi approach, LSDYNA.

1.0 Introduction: Deep drawing is the process of converting a blank into cup shaped articles like kitchen sinks, cooking pans, automobile panels, gas tanks, fountain pen caps etc. Wrinkles and fracture are the major defects in

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Taguchi Parameter Design for MIG Welding of Al-65032 Alloy in as Weld Condition

Dr. P.Prabhakar Reddy[1], Dr. P.V.R.Ravindra Reddy[2], Dr. A.A.Sriramkrishna[3] and Dr. N.V.Srinivasulu[4]

[1,2,4] Professors, Mechancial Engineering Department, ChaitanyaBharathi institute of technology,

[3] Associate Professor, Mechanical Engineering Department, Chaitanya Bharathi Institute of Technology Gandipet, Hydrabad-500 075, India.

Abstract

Al-65032 is an Aluminum alloy used for construction of aerospace structures such as wings. This alloy can be welded by TIG or MIG welding. Hence establishment of welding parameters and their optimization for good quality weld is utmost important factor. In this work, Taguchi parameter design is used to design the process parameters that optimise the mechanical properties of weld specimen. The process parameters of the MIG welding setup considered are gas pressure, current, groove angle and pre-heat. Assigning the process parameters to L-9 orthogonal array, experiments are conducted and the optimization condition is obtained along with the identification of most influencing parameters using S/N analysis and mean response analysis. ANOVA is also carried out to reaffirm the same. A confirmation test is conducted to ascertain the optimized condition.

Keywords: Al 65032, MIG, Taguchi, Orthogonal Arrays, S/N analysis, ANOVA

INTRODUCTION

Aluminum and its alloys are difficult to weld materials. Al-65032 is a precipitation hardening aluminum alloy and one of the most common alloys of aluminum for general purpose use. It is commonly available in pre-tempered grades such as, 65032-O (solutionized), 65032-T6 (solutionized and artificially aged), 65032-T651 (solutionized, stress-relieved stretched and artificially aged).it has a density of 2.70 g/cm^3 and the chemical composition of the alloy is shown in table 1.

Table 1. Chemical composition of Al-65032 alloy

Element	Si	Mg	Fe	Cu	Mn	Cr	Zn	Ti	Others	Al
Percent	0.4-0.8	0.7-1.2	< 0.7	0.15-0.4	< 0.15	0.04-0.35	< 0.25	< 0.15	< 0.15	Bal.

Al-65032 is widely used for construction of aircraft structures, such as wings and fuselages. It is also used in yacht construction, including small utility boats, in the construction of bicycle frames and components, in automotive parts, such as wheel spacers, aluminum cans for the packaging of foodstuffs and beverages etc, where welding is predominately used. Hence its welding characteristics need to be studied. This alloy is used in as weld and heat treated condition depending upon the application. The authors have carried out the parametric design for the alloy for heat treated condition[1]. In this work authors tried to implement the Taguchi parametric design for the alloy in as weld condition i.e without heat treatment.

Today, Tungsten Inert gas Welding (TIG) and Metal Inert Gas welding (MIG) are the two recommended options for welding aluminum and its alloys[2]. Metal inert gas (MIG) welding is a multi-objective and multi-factor metal fabrication technique and several process parameters interact in a complex manner resulting direct or indirect influence on weld bead geometry, mechanical properties and metallurgical features of the weldment as well as on the weld chemistry[3].

Studying the design parameters one at a time or by trial and error until a first feasible design is found is a common approach to design optimization[4].However, this leads either to a very long and expensive time span for completing the design or to a premature termination of the design process due to budget or schedule pressures[5]. Taguchi's approach to parameter design provides the design engineer with a systematic and efficient method for determining near optimum design parameters for performance and cost with an objective of selecting the best combination of control parameters so that the product or process is most robust with respect to noise factors.[6] i.e the aim of parametric design experiment is to identify and design the process parameters that optimize the chosen quality characteristic that are least sensitive to noise factors[7]. The method is applicable over a wide range of engineering fields that include processes that manufacture raw materials, sub systems, products for professional and consumer markets. The various steps for the parametric design are: determining the quality characteristic to be optimized, identifying the noise factors and test conditions, identifying the control parameters and their levels, selecting the suitable orthogonal array, conducting the experiments, analyze the data and determine the optimum levels and prediction of performance at these levels[8].In this work, the quality characteristics considered are mechanical properties such as UTS, 0.2% proof stress, percentage elongation and impact energy. Noise factors may include variations in environmental operating conditions. The control parameters identified are gas pressure, current, groove angle and preheat. Three levels are considered for the control parameters based on the preliminary tests. Since there are four parameters and three levels the orthogonal array L-9 can be selected for minimum number of experiments that is given by (L-1) F+ 1, where L and F are number of levels and the number of factors respectively[9].

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CONTROL OF EXHAUST EMISSIONS FROM AN SI ENGINE WITH METALLIC (COPPER) COATING, FUEL BLEND AND CATALYTIC CONVERTER

K. KISHOR

Associate Professor, Department of Mechanical Engineering, CBIT, Hyderabad, Telangana, India

ABSTRACT

As the fossil fuels are fastly depleting and the pollution levels are increasing with their use, necessitating the search for alternate fuels. Alcohol is a potential and renewable fuel for SI engine, because its properties are compatible to those of gasoline fuels. Aldehydes, with their carcinogenic nature are one of the major pollutants, when SI engines are run with alcohols. As these pollutants poses serious health hazards for human beings and causes environmental pollution, their reduction assumed importance. This paper reported the exhaust emissions and their control from a single cylinder, air-cooled, Bajaj make, two-stroke SI engine, with a brake power of 2.2 kW at a rated speed of 3000 rpm with a compression ratio of 7.5:1. The exhaust emissions of CO and UBHC were determined with Netel Chromatograph CO/UBHC analyzer. Aldehyde levels were determined by DNPH method. The test fuels are pure gasoline and methanol blended gasoline (80% gasoline and 20% methanol, by volume). The crown surface of piston and inside surface of the cylinder head were coated with copper for a thickness of 300 microns. A catalytic converter with air injection with sponge iron (SPI)/manganese (Mn) ore as catalyst was provided to the engine. In comparison with the conventional engine (CE) with experimental fuels, the performance of catalytically activated engine was found to be improved. **Air injection in to catalytic converter significantly decreased the exhaust emissions with sponge iron (SPI) as catalyst over manganese (Mn) ore.**

KEYWORDS: SI Engine, Alcohol, CO, UBHC & Aldehydes

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Original Article

INTRODUCTION

On the basis of the number of automotive vehicles being used by the public, the civilization of a particular country is measured. The population explosion imposes expansion of the cities to larger areas and common man is forced to travel through long distances, these days even for their routine works. This in turn is causing an increase in vehicular population at an alarming rate, thus bringing in pressure on government to spend huge foreign currency for importing crude petroleum to meet the fuel needs of the automotive vehicles. For individual transport, SI engine is preferred to CI engine. Though two-stroke engine develops more power when compared with four-stroke engine, it faces criticism, as it emits higher pollution levels. Alcohols are the promising substitutes for gasoline.

The use of alcohol in small quantities poses no problem in SI engines. Performance of the engine can also be improved with the change of fuel composition with alcohol-gasoline blends in SI engines. Out of the two alcohols available (methyl alcohol and ethyl alcohol), methyl alcohol is preferred to ethyl alcohol, as it is not harmful. Methyl alcohol has got properties compatible to those of gasoline. If alcohol is blended with gasoline up to 20% by volume, no major engine design modification is necessary. Many investigations were carried out [1-4] on

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Research Article

Experimental and Numerical Investigations on Crack Propagation in Titanium Alloys

Jyothirmayi Narne, Varimadugu Sandhya*, Nagini Yerramsetty and V. Jaipal Reddy

Department of Mechanical Engineering, Chaitanya Bharathi Instiute of Technology, Gandipet, Hyderabad-500075, Telangana State, India

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Abstract

The titanium alloys are the objects of wide experimental analysis in the terms of crack growth characteristics and mechanism of fracture due to their applications. The Ti-6.4%Al-2.6%Mo-1.7%Cr-0.5%Fe-0.5%Si (wt %) alloy was used in the investigation. The tensile tests were conducted on plate specimens. The test variables considered are width of tensile specimen, crack size and tensile loading. The mechanism of fracture that appeared in the specimens was established from the TEM micrographs of the replicas taken from different zones of the fracture surfaces. The mechanism of fracture was also studied using finite element analysis. The results obtained from the FEA were verified with experimental results. It can be concluded that there is a general trend of increasing stress intensity factor with increasing applied tensile load, crack size and width of the flat specimen. The strain energy release increases with increasing applied tensile load. Crack extension can occur when crack-driving force is equal to the energy required for crack growth. For a particular stress the energy release rate is proportional to the crack size. As the tensile load and the size of the initial crack increase, there is an increased crack growth in the Ti alloy. In the crack initiation zone evidence of quasi-cleavage fracture with limited plastic striations symptoms was found in the specimen tested under σ =1000MPa. Micro fracture analysis of the specimens (tested under σ=1100MPa) has revealed quasi-cleavage fracture with small symptoms of plastic shearing in the early part of cracking.

Keywords: *TEM micrographs, quasi-cleavage fracture, stress intensity factor, strain energy release, plastic shearing.*

1. Introduction

Titanium alloys are widely used for a variety of applications such as military aircraft, atomic energy and ocean components of structures due to their high strength, good thermal stability and excellent corrosion resistance. Simultaneously, the titanium alloys possesses a lot of different structures resulted from manufacturing process, heat treatment and that the fracture properties may also change. Large varieties of micro structural features observed in titanium alloys such as grain sizes, globular or lamellar type of structures, β-phase or (α+β) phase morphologies as well as bimodal structures produce different resistance to crack initiation and crack propagation of fracture. For this reason the titanium alloys are the objects of wide experimental analysis in the terms of crack growth characteristics and mechanisms of fracture.

Sergio Baragetti (2014) studied the effect of stress concentration factor and the role of different inert or corrosive environments. He found the threshold stress intensity factor after which the environment has no effect on the fatigue damage. Kuntimaddi Sadananda *et al.*, (2009) examined the role of stress range and the maximum stress in the fatigue crack nucleation and propagation. He also related this to both the stress life and fracture mechanics. Yang Cao *et al.*, (2015) used experimental – numerical hybrid method to simulate the fracture behavior of MIL composite. Chenchong Wang *et al.*, (2015) developed finite element model to study crack path and crack growth rate. Contour integral method was used to study the best thickness of austenite layer, the effect of crack propagation direction.

In this work, attention is paid on the Ti-6Al-3Mo-2Cr titanium alloy that finds applications as components of the aircraft engine. Analysis of crack growth in engine compressor disks made of this material was the subject of the work.

2. Methodology

The objectives of this work are:

- To study the fracture analysis of pre-cracked plates made of Ti-6Al-3Mo-2Cr titanium alloy experimentally.

*Corresponding author's ORCID ID: 0000-0003-3136-0888
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ENHANCING PRODUCTIVITY THROUGH SIX SIGMA IN MANUFACTURING INDUSTRIES

Bvs Rao*[1]& A.Divya Bharathi[2]

[*1]Assistant professor, MED,CBIT, Hyderabad

[2]BE 3rd year, MED, CBIT, Hyderabad

ABSTRACT

Over the last several months, the effort to become lean and lower the cost has echoed all the way from the halls of government to the smallest company's back room. In times of severe economic challenge, the natural reaction is to take decisions that can make an organization become as lean and focused to the extent possible. This paper discusses the benefits and pitfalls associated with lean manufacturing management starting from the idea that pleasing the customer should be at the root of all effort leading through the ravages of overzealous application of lean to the maximum. Elements of lean discussed in this paper address organizational waste, human resources, distributed design, supply chain management, customer management, and the financial system. This paper also discusses about the popular lean manufacturing environment and makes practical recommendations to new adopters to avoid failures due to the improper application of "lean" in their organization. It also aims to report the results of a study on the implementation of Lean Six Sigma (LSS) in a developing country. An effort is also made to report about the implementation of LSS to reduce the defects in casting, welding and grinding processes used in various manufacturing industries.

Keywords: *Productivity, six sigma, lean, DAMIC, DMADV, DPMO.*

I. INTRODUCTION

Six sigma is set of techniques and tools for improvement. It was developed by Motorola in 1986.Sir bill smith "the father of six sigma "introduced this quality improvement methodology to Motorola. Six sigma is now an enormous 'brand' in the worlds of cooperate development. A six sigma process is one in which 99.9999% of the products manufactured are statistically expected to be defect free i.e. 3 to 4 defects per million.

History

Since the 1920's the word sigma has been used by mathematicians and engineers as a symbol for a unit of measurement in product variation. In mid-1980's engineers in Motorola in USA used six sigma an informal name for an in house initiative forreducing defects in production processes, because it represented suitably high level of quality.In late 1980's Motorola extended the six sigma methods to critical business processes and six sigma became a formalized in-house branded name for performance improvement methodology i.e., beyond purely "defect reduction."In1991 Motorola certified its first black belt six sigma experts, which indicates the beginnings of formalization of the accredited training of six sigma methods. In 1995, six sigma became well known after Mr.Jack welch made in a central focus of his business strategy at general electric and today it is different sectors of industry. By the year 2000, six sigma was effectively established as industry in its own right, involving the training, consultancy and implementation of six sigma methodology.

Objectives of sixsigma:

- Overall bussiness improvement
- Remedy defects/varability
- Reduce costs
- Reduce cycle time
- Improve customer satisfaction

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DESIGNING AND MODELLING OF AN AUTONOMOUS ROBOT FOR CLEANING LAKE SURFACE

Keerthi Shravani N*[1], K T Ujwal Pratap Krishna[2] & Shri.B.V.S.Rao[3]

[*1,2]UG Student, [3]Asst. Professor, [1,3]MED, [2]IT, Chaitanya Bharathi Institute of Technology

ABSTRACT

About 71 percent of the Earth's surface is water-covered, and the oceans hold about 96.5 percent of all Earth's water which leaves us with only 3.5 percent of fresh water. Almost 1.74 percent of the available freshwater is trapped in the glaciers, which accounts to almost 68.7 percent of the total fresh water. The accessible fresh water is available as groundwater, lakes, rivers, ponds etc. Lakes serve as one of the primary sources of drinking water but lately they are being contaminated by various sources such as industrial effluents, discharge of the drainage water into the lake, physical contamination etc. The cleaning process of these water bodies is a real challenge and when done manually, it is laborious coupled with inefficiency. The objective of this paper is to design an **autonomous cleaning robot** aided with deep learning and other state of the art AI techniques which will help in the removal of surface impurities (E.g.: plastic covers, bottles, weeds etc.) as well as oil spills and restore the chemical balance of the water body. Using the developed model, we will be carrying out numerical simulations .The designed robot can work with minimum human interaction which accelerate the process of cleaning.

Keywords: *robot, water surface cleaning, autonomous.*

I. INTRODUCTION

Water Waste, in general, appears in many different forms such as agricultural, biomedical, chemical, electronic, mineral, organic/inorganic, radioactive, and urban/municipal etc.Nowadays almost all the manufacturing processes are being automated in order to deliver products at a faster rate. Automation plays an important role in mass production. In this project we have designed a fully autonomous lake cleaning machine. The aim of the project is to reduce the human intervention and time consumption for cleaning the lake. In this project we have automated the operation of lake cleaning with help of motors for propelling and conveyor belt-vacuum arrangement for cleaning purposes. The need for an "automated lake cleaning system" is of high significance as every day, nearly 2 million tons of sewage and industrial and agricultural waste are discharged into the world's water (UN WWAP 2003) which is equivalent to the weight of nearly entire human population of 6.8 billion people. The UN estimates that the amount of wastewater produced annually is about 1,500 km^3 , six times more water than the water that exists in all the rivers and lakes of the world. Lack of adequate sanitation contaminates water courses worldwide and is one of the most significant forms of water pollution. Worldwide, 2.5 billion people live without improved sanitation. According to UNICEF WHO 2008 over 70% of these people who lack sanitation, or 1.8 billion people, live in Asia. In some regions, more than 50% of native freshwater fish species are at risk of extinction, and nearly one third of the world's amphibians are at risk of extinction due to the wastes produced and deposited in lakes and ponds due various factors such as industrialisation, urbanisation, etc.

Despite the vast number of solutions implemented by the competent authorities and governments, the process of garbage management is tedious. The garbage produced is relatively higher than the amount of the garbage which is managed on a daily basis. Hence forth taking all these factors into consideration, a smart lake cleaning system could present a viable and optimal solution towards efficient water waste management

The proposed solution is to generate a model to detect water waste using image processing, internet-of-things and machine learning concepts. The model used for this project is Convolutional Neural Network (CNN), a Machine Learning algorithm. This system will ensure effective automated lake water waste management and will speed up the process of cleaning without any human intervention.

A Study of the Secondary Flow in Aircraft Engine Compressor Disks using Computational Fluid Dynamics

Syed Naveed Ahmed[1], Dr. P Ravinder Reddy[2], Dr Sri Ram Venkatesh[3]

1) *PhD Scholar, Mechanical Engineering Department, Osmania University, Hyderabad, Telangana, India.*
2) *Professor, Head, Mechanical Engineering Department, CBIT, Hyderabad, Telangana, India.*
3) *Professor, Mechanical Engineering Department, Osmania University, Telangana, India*

Abstract

The compressor disks of an aircraft engine which operate at very high rotational speeds are exposed to significant temperature gradients. These temperature gradients induce thermal stresses into the rotating disks which along with the existing dynamic stresses significantly reduce their useful field life. Hence it becomes essential to reduce the disk temperature gradients by utilizing a certain percentage of the compressor core flow known as the secondary flow for either heating or cooling these rotating parts. But this extraction of the compressor core flow results in a higher engine fuel burn for a given engine thrust. Hence the need arises for a better utilization of the secondary flow to effectively reduce the temperature gradients of the rotating compressor disks. As the secondary flow thermal phenomenon inside the rotating compressor disk cavities is very complex and due to it's direct impact on the life expectancy of the disks it becomes critical to understand it's thermo-fluid behaviour by the effective use of available Computational Fluid Dynamic tools. In the current study the secondary flow through the compressor disk cavities is simulated using Computational Fluid Dynamics (CFD) and the results are analysed and reported. The analysis of these results help in a better understanding of the distribution of the flow and the variations of the thermal fluid parameters across the secondary flow system. These results are also later used as thermal boundary conditions in the Finite Element model (FEM) to study the impact of various engine design parameters on the disk temperature gradients after being validated by the experimental results. The findings from this computer aided investigation offers support in make design improvements aimed at lowering the disk temperature gradients and enhancing their useful field life

Keywords: Compressor Secondary Flow, Computational Fluid Dynamics, Aircraft Engine, Compressor Disks, Thermo-fluid analysis.

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NUMERICAL ANALYSIS OF SIC REINFORCED AND UNREINFORCED FRICTION STIR WELDING OF AA6061

[1]MD. ALEEM PASHA, [2]P. RAVINDER REDDY

[1]Assistant Professor, Mechanical Engineering Department, CBIT, Hyderabad
[2]Professor and Head of MED and Principal, CBIT, Hyderabad
E-mail: aleemphd2013@gmail.com

Abstract - This paper explains the numerical analysis of Silicon carbide reinforced of 10%, 15%, 25%, and 30% by volume and unreinforced friction stir welding processes of aluminium alloy 6061. In this paper the heat input and temperature distribution during friction stir welding is investigated. The temperatures at different positions in the nugget zone were recorded with the temperature gun during welding under various welding conditions such as percentage of volume proportion of reinforcement. The finite element model was developed for different volume proportions of reinforcement and simulated using finite element method program (ANSYS).Validated the simulation results with experimental results.

Keywords - Friction stir welding, Aluminium alloy 6061, Silicon carbide, Numerical analysis, Temperature distribution

I. INTRODUCTION

Friction stir welding (FSW) is a novel solid-state joining process that may have significant advantages compared to the fusion processes as follow: Joining of conventionally non-fusion weldable alloys, reduced distortion and improved mechanical properties of weldable alloys joints due to the pure solid-state joining of metals.

In a typical FSW, a rotating cylindrical pin tool is forced to plunge into the plates to be welded and moved along their contact line. During the welding, heat is generated by contact friction between the tool and workpiece softens the material. Since no melting occurs during FSW, the process is performed at much lower temperatures than conventional welding techniques. Because of the highest temperature is lower than the melting temperature of the material, FSW yields fine microstructure [1]. Chen and Kovacevic studied on the finite element analysis of the thermal history and thermo mechanical process in the butt-welding of aluminum alloy 6061- T6 [2]. Nandan et al. modeled three-dimensional visco plastic flow and temperature field during FSW of 304 austenitic stainless steel mathematically [3]. Buffa et al. proposed a 3D FEM model for the FSW process that is thermo-mechanically coupled and with rigid-viscoplastic material behavior [4]. Zhang et al. developed solid mechanics based finite element models and computational procedures to study the flow patterns and the residual stresses in FSW. They concluded that with the increase of the translational velocity, the maximum longitudinal residual stress can be increased [5]. Chao et al. formulated the heat transfer of the FSW process into two boundary value problems (BVP)-a steady state BVP for the tool and a transient BVP for the workpiece [6]. Song and Kovacevic presented a three-dimensional heat transfer model for FSW. They introduced a moving coordinate to reduce the difficulty of modeling the moving tool and considered heat input from the tool shoulder and the tool pin in their model. They concluded that preheat to the workpiece is beneficial to FSW [7]. Hamilton et al. developed a thermal model of FSW that utilizes a new slip factor based on the energy per unit length of weld. The slip factor was derived from an empirical, linear relationship observed between the ratio of the maximum welding temperature to the solidus temperature and the welding energy [8]. Soundararajan et al. developed a thermo-mechanical model with both tool and workpiece using mechanical loading with thermal stress to predict the effective stress development at the bottom of workpiece with uniform boundary conditions. [9]. Rajamanickam et al. investigated the effect of process parameters such as tool rotation and weld speed on temperature distribution and mechanical properties of aluminum alloy AA2014 joined by friction stir welding.

A three dimensional transient thermal model using finite element code ANSYS was developed and experimentally validated to quantify the thermal history [10].

FSW process is a complicated process which involves many variables. The amount of temperature generated during the welding process is the important parameter of the process. The heat input due to this temperature decides the quality of the joint. Sufficient temperature should be generated to plasticize the material and to make it flow and then it is forged on the other side so that a sound weld is achieved. Finite element modeling has been done on un-reinforced and reinforced friction stir welds of aluminium alloy 6061 and by using "ANSYS12.0". One side portion of the workpiece was modeled as the plates were in symmetrical. The main objective of this study is to validate the predicted temperatures with experimental temperatures and the effect of percentage of reinforcement on the temperature generated.

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Finite Element Analysis of SiC Reinforced and Unreinforced Friction Stir Welding of Mg Alloy AZ31B

Dr. Md. Aleem Pasha
Assistant Professor, Mechanical Engineering Department, CBIT, Hyderabad
Dr. P. Ravinder Reddy
Professor and Head of MED and Principal, CBIT, Hyderabad
Dr.P.Laxminarayana
Professor, Mechanical Engg. Department & Dean Faculty of Engg. UCE, OU, HYD.

Abstract
This paper explains the numerical analysis of Silicon carbide reinforced of 10%, 15%, 25%, and 30% by volume and unreinforced friction stir welding processes of magnesium alloy AZ31B. In this paper the heat input and temperature distribution during friction stir welding is investigated. The temperatures at different positions in the nugget zone were recorded with the temperature gun during welding under various welding conditions such as percentage of volume proportion of reinforcement. The finite element model was developed for different volume proportions of reinforcement and simulated using finite element method program (ANSYS).Validated the simulation results with experimental results.

Keywords: Friction stir welding, magnesium alloy AZ31B. Silicon carbide, Numerical, analysis, Temperature distribution

1. Introduction

Friction stir welding (FSW) is a novel solid-state joining process that may have significant advantages compared to the fusion processes as follow: Joining of conventionally non-fusion weldable alloys, reduced distortion and improved mechanical properties of weldable alloys joints due to the pure solid-state joining of metals. In a typical FSW, a rotating cylindrical pin tool is forced to plunge into the plates to be welded and moved along their contact line. During the welding, heat is generated by contact friction between the tool and workpiece softens the material. Since no melting occurs during FSW, the process is performed at much lower temperatures than conventional welding techniques. Because of the highest temperature is lower than the melting temperature of the material, FSW yields fine microstructure [1]. Chen and Kovacevic studied on the finite element analysis of the thermal history and thermo mechanical process in the butt-welding of aluminum alloy 6061- T6 [2]. Nandan et al. modeled three-dimensional visco plastic flow and temperature field during FSW of 304 austenitic stainless steel mathematically [3]. Buffa et al. proposed a 3D FEM model for the FSW process that is thermo-mechanically coupled and with rigid-viscoplastic material behavior [4]. Zhang et al. developed solid mechanics based finite element models and computational procedures to study the flow patterns and the residual stresses in FSW. They concluded that with the increase of the translational velocity, the maximum longitudinal residual stress can be increased [5]. Chao et al. formulated the heat transfer of the FSW process into two boundary value problems (BVP)-a steady state BVP for the tool and a transient BVP for the workpiece [6]. Song and Kovacevic presented a three-dimensional heat transfer model for FSW. They introduced a moving coordinate to reduce the difficulty of modeling the moving tool and considered heat input from the tool shoulder and the tool pin in their model. They concluded that preheat to the workpiece is beneficial to FSW [7]. Hamilton et al. developed a thermal model of FSW that utilizes a new slip factor based on the energy per unit length of weld. The slip factor was derived from an empirical, linear relationship observed between the ratio of the maximum welding temperature to the solidus temperature and the welding energy [8]. Soundararajan et al. developed a thermo-mechanical model with both tool and workpiece using mechanical loading with thermal stress to predict the effective stress development at the bottom of workpiece with uniform boundary conditions. [9]. Rajamanickam et al. investigated the effect of process parameters such

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CHARACTERIZATION OF DELAMINATION BEHAVIOR OF CARBON/EPOXY LAMINATES USING DOUBLE CANTILEVER BEAM (DCB) SPECIMENS

P. Ashok Kumar,
Research Scholar, Mechanical Engineering, Jawaharlal Nehru Technological, University Hyderabad, Hyderabad. Telangana, India.

P. Ravinder Reddy,
Professor& Principal, Chaitanya Bharati Institute of Technology, Hyderabad, (Osmania University Hyderabad), Telangana, India.

AVSSKS. Gupta,
Professor of Mechanical Engineering, JNTUH College of Engineering, Hyderabad. Telangana, India.

ABSTRACT

Interlaminar fracture toughness plays an important role to predict delamination growth and strength of the overall composite structure. The influence of ply orientation on the Mode I interlaminar fracture behavior of the carbon/epoxy composite laminate in quasi-static loading was investigated using the double cantilever beam (DCB) specimen. Tests were carried out on four different 16-ply specimens to measure the interlaminar fracture toughness in terms of critical strain energy release rate, G_{Ic}. Experimental results showed that the Mode I interlaminar fracture toughness at the crack initiation and propagation increases with adjacent ply orientations. The plateau value of R-curve increases with the adjacent ply angles which was correlated to fiber bridging. Further, preliminary results in terms of G_{Ic} initiation values showed good agreement between the finite element analysis (FEA) and experimental results.

Keywords: Carbon/Epoxy, Delamination, Fiber Bridging, Interlaminar Fracture Toughness, Quasi-Static Condition

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Influences of process parameters on weld strength of low carbon alloy steel in purged SAW

M. Sailender[a]*, G. ChandraMohan Reddy[b], S. Venkatesh[c]

[a]*Dept. of Mechanical Engineering, University College of Engineering, Osmania University, Hyderabad -500 007, India.*
[b]*Mahathma Gandhi Institute of Technology, Gandipet, Hyderabad -500 075, India.*
[c]*Mechanical Engineering Department, University College of Engineering, Osmania University, Hyderabad -500 007, India.*

Abstract

Submerged arc welding (SAW) is one of the most widely employed welding process in manufacturing industry due to its inherent advantages such as deep penetration, smooth bead and reliability with high quality. SAW is notable with a large number of process parameters, which act together in an intricate manner and influence the output performance, successively affects the weld quality. As quality is at high priority, it is important in selecting process parameters. In the present work, parametric optimization of main factors, viz. Open circuit voltage (OCV), wire feed rate (WFR), welding speed (WS) and nozzle to plate distance (NPD) and thus to study influences on weld strength. Taguchi's L_9 orthogonal array, at three levels, has been adopted to conduct experiments as part of design experiments. Experiments are conducted 'purging with CO_2 gas' in SAW to investigate the weld strength variations against the traditional SAW 'as weld' condition. The performance measure of control levels to select, are observed through S/N ratio, as the best cope with the noise to their effect. Analysis of variance (ANOVA) is calculated to make a note of significance parameter with contributions. The correlations are established between parameters and performance outputs using linear regression analysis. Mathematical models are developed and checked for their adequacy with the F-test, determined quantitatively and presented graphically. The direct and indirect effects of process parameters are presented in achieving desired weld quality. The models are validated through confirmation tests and predicted the results, are found within the limits.

Selection and Peer-review under responsibility of International Conference on Advanced Materials and Applications (ICAMA 2016).

Keywords: Submerged Arc Welding, Design of Experiments, Regression Models, Analysis of Varince.

* M. Sailender. Tel.: +91-888-491-2646.
E-mail address: sailumamu@gmail.com

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Research Article

Experimental Investigations on Exhaust Emissions with Low Heat Rejection Diesel Engine with Crude Vegetable Oil with Magnetic Induction

D.S.Madhuri[#], M.Ravi Chandra[^] and M.V.S.Murali Krishna[#*]

[#]Department of Mechanical Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana India
[^]Mechanical Engineering Department, Gayatri Vidyaparishat College of Engineering, Madhuravada, Visakhapatnam, Andhra Pradesh, India

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Abstract

In the scenario of fast depletion of fossil fuels and increase of pollution levels the search for alternative fuels has become pertinent. Particulate emissions and oxides of nitrogen are exhaust emissions from diesel engine cause health hazards once they are inhaled in. They also cause environmental impact. Hence control of these pollutants is an immediate task and urgent. Crude vegetable oils are important substitutes for diesel fuel, as they are renewable, and have comparable properties with diesel fuel. However, drawbacks associated with crude vegetable oil of high viscosity and low volatility which cause combustion problems, call for low heat rejection (LHR) engine with its significant characteristics of maximum heat release and ability to handle the low calorific value fuel. LHR engine consisted of ceramic coated cylinder head. A hydrocarbon fuel was polarized by exposure to external force such as magnetism. Exhaust emissions of particulate emissions and oxides of nitrogen (NO_x) were determined at full load operation with conventional engine (CE) and LHR engine with and without magnetic induction with vegetable oil operation. LHR engine with crude vegetable oil operation with magnetic induction improved exhaust emissions when compared with CE with vegetable oil operation.

Keywords: *Alternative fuels, Vegetable oil, Low heat rejection, Exhaust emissions*

1. Introduction

Fossil fuels are limited resources; hence, search for renewable fuels is becoming more and more prominent for ensuring energy security and environmental protection. It has been found that the vegetable oils are promising substitute for diesel fuel, because of their properties are comparable to those of diesel fuel. They are renewable and can be easily produced. When Rudolph Diesel, first invented the diesel engine, about a century ago, he demonstrated the principle by employing peanut oil. He hinted that vegetable oil would be the future fuel in diesel engine [Acharya, 2009]. Several researchers experimented the use of vegetable oils as fuel on conventional engines (CE) and reported that the performance was poor, citing the problems of high viscosity, low volatility and their polyunsaturated character. It caused the problems of piston ring sticking, injector and combustion chamber deposits, fuel system deposits, reduced power, reduced fuel economy and increased exhaust emissions [Venkanna *et al*, 2009; Misra *et al*, 2010; No.Soo-Young, 2011; Avinash Kumar *et al*, 2013].

The drawbacks associated with biodiesel (high viscosity and low volatility) call for hot combustion chamber, provided by low heat rejection (LHR) combustion chamber. The concept of the LHR engine is reduce heat loss to the coolant with provision of thermal resistance in the path of heat flow to the coolant. Three approaches that are being pursued to decrease heat rejection are (1) Coating with low thermal conductivity materials on crown of the piston, inner portion of the liner and cylinder head (LHR–1 engine), (2) air gap insulation where air gap is provided in the piston and other components with low-thermal conductivity materials like superni (an alloy of nickel),cast iron and mild steel (LHR–2 engine) and (3).LHR –3 engine contains air gap insulation and ceramic coated components.

Experiments were conducted on LHR-1 engine with vegetable oil. [Murali Krishna *et al,* 2012; Ratna Reddy *et al,* 2012; Kesava Reddy *et al,* 2012;]. They reported from their investigations, that LHR-1 engine at an optimum injection timing of 31° bTDC with vegetable oil operation at full load operation–decreased particulate emissions by 25–30% and increased NO_x levels, by 30–35% when compared with neat diesel operation on CE at 27° bTDC.

*Corresponding author's ORCID ID: 0000-0002-3528-1987

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Full Length Article

Investigation on performance and emission characteristics of EGR coupled semi adiabatic diesel engine fuelled by DEE blended rubber seed biodiesel

K. Vamsi Krishna [a,*], G.R.K. Sastry [a], M.V.S. Murali Krishna [b], John Deb Barma [a]

[a] Mechanical Engineering Department, NIT Agartala, 799046, India
[b] Department of Mechanical Engineering, CBIT Hyderabad, 500075, India

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ABSTRACT

The test case was semi adiabatic diesel engine (SADE) produced by thermal barrier 8 YSZ (Yttria Stabilized Zirconia) ceramic coated cylinder head and liner with bond coat NiCrAl as an intermediate layer and coupled with an EGR (exhaust gas recirculation) of 10% constant rate. The test fuels injected directly into the combustion chamber are diesel and blend A15B85 by vol. (Additive Diethyl Ether 15% + Rubber seed based Biodiesel 85%). Throughout the experimentation, a constant compression ratio 18:1, fuel injection pressure 190 bar and speed 1800 rpm. Load from 0% to 100% and start of injection (SOI) timing from 30^0 BTDC to 35^0 BTDC were varied to investigate performance, in-cylinder pressure and emission parameters of SADE and ordinary diesel engine (ODE) fuelled by test fuels. It was found that advancement of SOI timing improved all the investigated parameters except NOx emissions. Compared to ODE with diesel at any specific SOI timing, the test case with blend found to be favourable. The optimum results of SADE were 7% enhancement of BTE with the reduction in BSEC by 5.5%, particulates by 48.5%, NOx by 19.5% and exhaust gas temperature by 18.5% found with the blend at 33^0 BTDC with higher load compared to ODE with neat diesel at 30^0 BTDC. The optimum configuration of ODE found to be diesel fuel at 34^0 BTDC with higher load.

Introduction

The objective of the current study is to present a better viable solution to an ordinary diesel engine fuelled by fossil diesel. Even though many technological advancements to improve diesel engine efficiency and emissions were made, still much remains to investigate. The chief hurdles of the ordinary diesel engine at normal operating conditions are low efficiency (only about 29–30%) and higher exhaust emissions like particulate matter, CO, unburnt HC, CO2 etc. The various reports published in recent years on fossil fuels showed a rapid decline in its reserves and strongly suggests for alternatives. Hence, in the current study an attempt is made to address all the above problems through a slight modification (Thermal Barrier Coating) to core engine components along with 100% renewable fuel (blend of rubber seed based biodiesel and diethyl ether additive) operation. Also, an attempt is made to find out the optimum engine operating configuration for the blend A15B85.

The acute problems faced by the world regarding conventional/fossil-based energy were the rapid decline in proved reserves and the damage to the atmosphere by fossil pollutants emitted from internal combustion engines that currently reached a wholly insupportable conclusion and needs sustainable addressing through technological advancements besides adopting alternative energy strategy. Significant research progress [1] regarding biodiesel acknowledged it as environmentally friendly fuel and potential alternative and also found that the properties of biodiesel were directly related to the type of source feedstock. Review of different studies [2,3] regarding biodiesel as alternative fuel in compression ignition engine found that brake thermal efficiency (BTE), CO, HC and Smoke were reduced significantly whereas brake specific fuel consumption (BSFC) and NOx emissions increased. It was found [4] that CI engine fuelled by a blend of diesel and low percentage biodiesel showed improvement in BTE, ignition delay, smoke, CO and HC compared to diesel fuel. The presence of toxic compounds in the oil sources like Jatropha, Karanja and Rubber seed makes them unfit for human consumption (non-edible) and hence can be

* Corresponding author.
E-mail address: masikrish@gmail.com (K. Vamsi Krishna).
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Analysis of EGR Coupled Less Heat Rejection Model of Diesel Engine with Blends of Jatropha Biodiesel, Diesel and Diethyl Ether: An Experimental Approach

K. V. Krishna[1*], G. R. K. Sastry[1] and M. V. S. M. Krishna[2]

[1]Department of Mechanical Engineering, National Institute of Technology Agartala, Tripura State, India
[*]Email: masikrish@gmail.com
[2]Department of Mechanical Engineering, CBIT, Hyderabad, Telangana State, India

ABSTRACT

The experimental investigation on a less heat rejection model (LHRM) of the diesel engine was done with the objective to improve the performance and emission characteristics. The LHRM has a bond coat of NiCrAl interposed between the thermal barrier ceramic coated cylinder head and liner of the engine. The model is coupled with exhaust gas recirculation (EGR) system at a constant rate of 10 vol.%. The test fuels are neat diesel for the non-coated engine (NCE) and blends with different ratios of diesel-Jatropha biodiesel, keeping a constant ratio of additive diethyl ether (DEE) for the LHRM. The load was varied from 0 to 100 % and injection timing (IT) from 29° to 34° BTDC. The performance parameters of both engines improved significantly with the advancement of the injection timing. The NOx emissions reduced with no effect on BSEC, BTE and smoke levels with 10 % EGR rate. The optimum blend and IT for LHRM are D20JB60A20 by vol. (20 % of diesel + 60 % of Jatropha biodiesel + 20 % of additive DEE) and 32° BTDC as the maximum enhancement of about 6 to 7 % in peak BTE with a reduction in BSEC by 9.5 %, EGT by 18 %, VE by 2 to 3 %, smoke level by 44.5 % and NOx emissions by 14.2 % were found compared to NCE with diesel at normal operating conditions. At advanced injection timings with a higher load, in comparison to NCE, LHRM showed significant improvement in all of the investigated parameters.

Keywords: Less heat rejection model; yttria-stabilized zirconia; exhaust gas recirculation; injection timing; diethyl ether additive; Jatropha biodiesel.

NOMENCLATURE

LHRM	less heat rejection model
NCE	non-coated engine
JB	jatropha biodiesel
DEE	diethyl ether
YSZ	yttria stabilized zirconia
NiCrAl	nickel-chromium-aluminum
EGR	exhaust gas recirculation
BTDC	before top dead center
BTE	brake thermal efficiency
EGT	exhaust gas temperature
BSEC	brake specific energy consumption
VE	volumetric efficiency

Effect of Copper Coated Piston on Thermal and Structural Stability of Four Stroke SI Engine Combustion Chamber

Ch. Indira Priyadarsini, Dr. M. V. S. MuraliKrishna, Dr. P. Usha Sri

Assistant professor, Mechanical Engg. Dept., CBIT, Gandipet, Hyderabad,

Professor, Mechanical Engg. Dept., CBIT, Gandipet, Hyderabad

Professor, Mechanical Engg. Dept., OU, Hyderabad
med.amere13@gmail.cim

Abstract

The heat from combustion is not fully converter to work as heat leak from inlet and outlet valve seat. Thermal coat studies have been suggesting that heat loss can be reduced by metal coating on engine combustion chamber. The objective of this work is to study the effect of copper coating on performance of lubricating oil as it has evaporative temperature limit around 280^0Cand its effect on life of piston. Experimentally it is difficult to check the temperature flow between piston and liner wall where the lubricating oil presents, therefore a numerical method of finite element method is adopted. Modeling is created using solid works; boundary conditions are calculated analytically using empirical formulas. It is observed that copper coating enhances the heat transfer by pre flame propagation and piston experienced wear and cracks in long run.

Keywords: copper coat, piston, liner, SI engine, thermal analysis

1. Introduction

Higher efficiencies, lower specific fuel consumptions and reduce emissions in modern internal combustion (IC) engines has become the center of attention to engine researchers and manufacturers. The global concern over the depletion of fossil fuels and the more stringent emissions regulations has placed the obligation on the engine industry to produce practical, economical and environmentally conscious solutions to power our automobiles. Heat utilization is one of the primary loss mechanisms in an internal combustion engine and it plays a crucial role in all aspects of engine operation. As a result, the want to better understand the effects of heat transfer on engine dynamics has led to a great deal of work in the field.

Silvio Memme[1] investigated and compared a baseline copper coating and a metal TBC. It was found reducing surface roughness of both coatings increased in-cylinder temperature and pressure as a result of reduced heat transfer through the piston crown. These increases resulted in small improvements in both power and fuel consumption, while also having measurable effect on emissions. Engine modification with copper coating on piston crown and inner side of cylinder head improves engine performance as copper is better conductor of heat and good combustion is achieved with copper coating. [2-3]. Muralikrishna etal.[4-6] studies the performance of SI engine by changing fuel composition, change of combustion chamber design and with provision of catalytic converter. Methanol blended gasoline (gasoline blended with methanol, 20%, by vol) improved engine performance and decreased pollution levels when compared with pure gasoline on CE. Ravindra Gehlot et.al.[7] analyzed ceramic coated diesel engine piston and found a significant increase in the pistons top surface temperature occurs with coating having holes. Although, the substrate temperature is decreasing with increase the radius of the holes. S.Srikanth Reddy et.al.[8] performed thermal analysis using ANSYS and optimized the piston using finite element analysis. The influence of ceramic coating thickness on temperature variations are studied by finite element method using ANSYS. S. Krishnamani et.al.[9], The temperature distribution analyses were conducted for the ceramic coating thickness of 0.3 mm over the piston crown surface. The results of the piston coated with two different coatings were analyzed. Dr.K.Kishor determined the temperature distribution across

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NUMERICAL ANALYSIS ON INFLUENCE OF VARIOUS PARAMETERS AND THEIR INTERACTIONS ON DRAWABILITY OF CYLINDRICAL CUPS

P. V. R. RAVINDRA REDDY[1] & A. A. SRIRAMAKRISHNA[2]

[1]*Professor, Department of Mechanical Engineering, CBIT, Gandipet, Hyderabad, India*

[2]*Associate Professor, Department of Mechanical Engineering, CBIT, Gandipet, Hyderabad, India*

ABSTRACT

Deep drawing is a complex process that is influenced by various parameters like tooling configurations, blank configurations, material properties, and forming conditions. Limit Drawing Ratio and limit strains are two parameters to indicate the draw ability of the material. In this paper, the effect of various parameters like die and punch corner radii, clearance, blank holding force, friction coefficient between die and punch, punch diameter on limit drawing ratio is investigated and presented by using an explicit finite element code LSDYNA 3D. The model is validated by comparing force obtained by the existing experimental setup with the one obtained with simulation. Initial estimation of the effect of the parameters listed above and their interactions is found out by using two levels L8 orthogonal array. After identifying the most effective parameters, their effect on the LDR is studied and presented.

KEYWORDS: Limit Drawing Ratio (LDR), Orthogonal Arrays & Column Effect Method

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Original Article

INTRODUCTION

Deep drawing process is used to manufacture complicated parts from sheet metal and is used in many industries such as automobile, aerospace, appliance and so on. The process design of the deep drawing process involves so many parameters such as tooling configurations, blank configurations, material properties, and forming conditions, thereby involving a lot of trial and error runs which increase not only the cost of development but also the time to market. Therefore, systematical design and process simulations have presented themselves as a vital part in today's competitive systems.

Drawability is defined as the ability to draw the blanks into cups of desired shape without any defects and is difficult to be quantified. One of the parameters which indicate the drawability is the limit drawing ratio, which is the ratio of the maximum blank diameter to the cup diameter at the onset of tearing. The limit drawing ratio is usually limited by the maximum allowable drawing force at the beginning of the punch nose rounding, when punch nose radius is not too great and appreciable stretching over the punch nose done not take place [1]

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Non-Destructive Analysis of FSW Process and Comparison With Simulation and Microstructural Analysis

T.Pavan kumar[1*], P.Prabhakar Reddy[2]

[1],*Rayalaseema University,Kurnool,Indua*
[2]*Department of Mechanical Engineering,CBIT,Hyderabad,India.*

Abstract

Friction Stir Welding is an evolving metal joining technique and is mostly used in joining materials which cannot be easily joined by other available welding techniques. It is a technique which can be used for welding dissimilar materials also. The strength of the weld joint is determined by the way in which these material are mixing with each other, since we are not using any filler material for the welding process the intermixing has a significant importance. The complication with the friction stir welding process is that there are many process parameters which effect this intermixing process such as tool geometry, rotating speed of the tool, transverse speed etc.,In this study an attempt is made to compare the material flow and weld quality of various weldments by changing the parameters. Thermographic analysis is used to characterize the microstructure of the elements. Thermography is a non destructive, accurate and fast way of measurement of temperature of the welding process which influences the formation of microstructure and also material flow and strength of the formed weldment.. In this study the relationship between microstructures and temperatures are evaluated. Simulation studies are also conducted and compared with experimental studies . the study resulted in good correlation between the experimental and simulation studies.the study involved use of different tool profiles and a comparative study is done with resulted mechanical and microstructural properties.

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Keywords: *Friction Stir Welding, non-Destructive Testing, mechanical properties, simulation*

* Corresponding author. Tel.: +040-29705282; fax: +040-29705284.
*E-mail address:*pavanaries2010@gmail.com

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EXPERIMENTAL INVESTIGATIONS ON PERFORMANCE EVALUATION OF DI DIESEL ENGINE WITH CRUDE JATROPHA OIL WITH VARYING INJECTION TIMINGS AND INJECTION PRESSURES

V.V.R.Seshagiri Rao
Assistant Professor
Mechanical Engineering Department,
Chaitanya Bharathi Institute of Technology, Hyderabad, India

Abstract : ***Alternate fuel research has been the topic of the highest priority in the context of depletion of fossil fuels at alarming rate. The high consumption of diesel fuel (DF) compels for the substitution of diesel fuel with suitable and renewable alternative fuels. Vegetable oils are the major alternative fuels for diesel fuel. They have comparable energy content and cetane number to diesel fuel. In the present work, the crude jatropha oil (CJO) is used as the alternative fuel for diesel. Experiments were conducted on the Conventional Diesel Engine (CE) to evaluate the performance and emissions with CJO operation, at different injection timings and injection 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 injection pressure was varied from 190 bar to 270 bar (in steps of 40 bar). At the recommended injection 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 CJO operation. At the optimum injection timing of 32^0 bTDC, CJO operation showed comparable performance when compared with diesel operation at recommended injection timing.***

IndexTerms - Crude jatropha oil, Performance, Exhaust Emissions, Injection Timing, Injection 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. Smoke and NO_X are the main pollutants from diesel engine. When inhaled, they cause many health hazards like headache, nausea, increased susceptibility to infections, respiratory problems, lung cancer and skin cancers [1]. Hence control of these emissions is important.

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 [2-9] conducted experimental investigations on diesel engine using vegetable oil and reported that the engine performance slightly deteriorated while the emissions increased, when compared with that of the diesel fuel. On the other hand, the researchers [10-14] reported improvement of engine performance, decrease of smoke levels and slight increase of NOx emissions.

Investigations were carried out by various researchers [15-16] on the influence of injection timing on the performance and emissions of diesel engine fuelled with vegetable oil. They reported that with the advancing of injection timing, the performance parameters improved, smoke levels reduced and NO emissions increased.

The researchers [17-19] have studied the influence of injection pressure on the performance of DI diesel engine with vegetable oil operation. An increase in injector pressure resulted in improved performance and reduced smoke emissions.

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

II. MATERIALS AND METHODS

Figure 1 shows the schematic diagram of the experimental set up for the diesel operation. The engine is a single cylinder, four stroke and direct injection type diesel engine with a rated output of 3.68 kW at a rated speed of 1500 rpm. The compression ratio is 16:1. The manufacturer's recommended injection timing and injection pressures are 27 bTDC and 190 bar respectively. The brake power was measured by an electrical dynamometer. The consumption of air and fuel by the engine were measured by air-box method and burette method respectively. The specifications of the engine are given in Table-1.

CJO was injected into the engine in the conventional manner, similar to that of diesel. The experimental set-up for jatropha oil operation will be same as that for diesel operation. Jatropha oil is non-edible. It can be obtained from *Jatropha curcus* plant, which can be grown in waste, arid lands and is not grazed by cattle. The seeds of the plant can be crushed to yield about 25% oil. The CJO has been found to be an attractive alternative fuel for diesel in C.I. engines. The properties of diesel and jatropha oil are given in Table-2.

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EFFECT OF STACKING SEQUENCE ON THE PERFORMANCE OF GAS TURBINE CASING USING MODAL ANALYSIS

Dr. S. Solomon Raj
Assistant Professor, Department of Mechanical Engineering,
Chaitanya Bharathi Institute of Technology, Hyderabad, India

ABSTRACT:

Gas turbine is a critical component used in many applications such as automotive, air-craft and spacecraft. Performance of a gas turbine depends on the weight of the casing and its vibration characteristics. Composites are promising materials now days which are finding applications in every field of engineering. In this work, an effort has been made to design gas turbine casing with composite materials so as to explore the advantages of them. Modal analysis is carried out for gas turbine casing made with conventional materials and composite materials with different stacking sequences. The results have shown that the casing made with composite material out performs the conventional casing when proper stacking sequence is selected.

Keywords: gas turbine casing, stacking sequence, modal analysis

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1. INTRODUCTION:

Vibrations can be defined as mechanical oscillations of a system which is displaced from its position of equilibrium. Every object has a different response to excitations depending on material properties, geometry, and boundary conditions. For any material, it is convenient to describe the vibration response by considering three main parameters: amplitude, vibration mode shape and frequency.

This work reports on the static mechanical and modal analysis by free vibration response of hybrid natural Fiber reinforced polymer composites. Modal analysis may predict the failure of structures prone to dynamic loading conditions.

Solomon raj et.al [1, 2, 3, 4] explained the importance of the fiber orientation. He had studied on the effect of stacking sequence to improve the performance of a marine propeller. The study has shown that properly designed composite material can outperform the conventional materials.

Composite materials have high-strength-to-weight and stiffness-to-weight ratios, which can lead to substantial weight savings.

PERFORMANCE AND EXHAUST EMISSIONS ANALYSIS OF CERAMIC COATED DIESEL ENGINE WITH LINSEED OIL BASED BIODIESEL

Dr.S.Narasimha kumar,
Assistant Professor
Department of Mechanical Engineering Department,
Chaitanya Bharathi Institute of Technology, Hyderabad, India

Abstract: The uses of biodiesel are increasingly popular because of their low impact on environment. However, it causes combustion problems in conventional diesel engine [CE]. Hence it is proposed to use the biodiesel in low heat rejection (LHR) diesel engines with its significance characteristics of higher operating temperature, maximum heat release, and ability to handle the lower calorific value (CV) fuel etc,. In this work, biodiesel from linseed was used as sole fuel in both versions of the combustion chamber. Engine with LHR combustion chamber was developed with ceramic coating on inside portion of cylinder head by partially stabilized zirconia of 0.5 mm thickness. The experimental investigations were carried out on a four stroke, single cylinder, DI, 3.68 kW at a speed of 1500 rpm, In this investigation, comparative studies on performance parameters was made on CE and engine with LHR combustion chamber with different operating conditions of biodiesel with varied injector opening pressure and injection timing. CE showed compatible performance while LHR combustion chamber showed improved performance with biodiesel operation in comparison with pure diesel operation on CE.

Index Terms: **Alternate Fuels, Vegetable Oils, Biodiesel, LHR combustion chamber, Performance parameters.**

I. INTRODUCTION

The paper is divided into i) Introduction, ii) Materials and Methods, iii)Results and Discussions, iv) Conclusions, Future scope of work, v) Acknowledgements followed by References.

Introduction deals with investigations carried out by researchers in the work related to the authors or brief literature review. .This section deals with need for alternate fuels in diesel engine, problems with use of crude vegetable oil in diesel engine, advantages of use of preheated vegetable oil in diesel engine, use of biodiesel in diesel engine, effect of increase of injector opening pressure and advanced injection timing on the performance of the diesel engine, concept of engine with LHR combustion chamber, advantages of LHR combustion chamber, classification of engines with LHR combustion chamber, use of diesel, crude vegetable oil and biodiesel in engine with LHR combustion chamber, research gaps and objectives of the investigations.

The world is presently confronted with the twin crises of fossil fuel depletion and environmental degradation. The fuels of bio origin can provide a feasible solution of this worldwide petroleum crisis(1-2).

It has been found that the vegetable oils are promising substitute, because of their properties are similar to those of diesel fuel and they are renewable and can be easily produced. Rudolph Diesel, the inventor of the diesel engine that bears his name, experimented with fuels ranging from powdered coal to peanut oil. Several researchers [3-6] experimented the use of vegetable oils as fuel on diesel engine and reported that the performance was poor, citing the problems of high viscosity, low volatility and their polyunsaturated character. Viscosity can be reduced with preheating. Experiments were conducted [7-10] on preheated vegetable [temperature at which viscosity of the vegetable oils were matched to that of diesel fuel] oils and it was reported that preheated vegetable oils improved the performance marginally. The problems of crude vegetable oils can be solved, if these oils are chemically modified to bio-diesel.

Bio-diesels derived from vegetable oils present a very promising alternative to diesel fuel since biodiesels have numerous advantages compared to fossil fuels as they are renewable, biodegradable, provide energy security and foreign exchange savings besides addressing environmental concerns and socio-economic issues. Experiments were carried out [11-15] with bio-diesel on direct injection diesel engine and it was reported that performance was compatible with pure diesel operation on conventional engine. Few investigators [16-19] reported that injector opening pressure has a significance effect [20] on the performance and formation of pollutants inside the direct injection diesel engine combustion.

Performance Parameters And Combustion Characteristics Of Ethanol–Gasoline Blends in Modified Two Stroke Spark Ignition Engine

Dr.S.Narasimha Kumar
Asstistant Professor
Mechanical Engineering Department,
Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad,India

Abstract: Automobiles have become critically indispensable to our modern life style. On the other hand, future of automobiles, built on the internal combustion engines, has been badly hit by the twin problems due to diminishing fuel supplies and environmental degradation. Thus, it is very important to identify some clean-burning, renewable, alternative fuels to ensure the safe survival of internal combustion engines. In the present paper investigations were carried out to evaluate the performance of two-stroke, single cylinder spark ignition (SI) engine with alcohol blended (80% gasoline and 20% ethanol by volume) having copper coated combustion chamber [copper-(thickness, 300 μ) coated on piston crown, and inner side of cylinder head]. Performance parameters [brake thermal efficiency, exhaust gas temperature and volumetric efficiency] were determined at various values of brake mean effective pressure of the engine, while combustion characteristics [peak pressure, maximum rate of pressure rise, time of occurrence of peak pressure and maximum heat release] were evaluated at full load operation of the engine with alcohol blended gasoline. Comparative studies were made on performance parameters and combustion characteristics with conventional SI engine with pure gasoline operation. Brake thermal efficiency increased with alcohol blended gasoline with both versions of the combustion chamber. Copper-coated combustion chamber (CCCC) showed improved performance and combustion parameters when compared with conventional engine (CE) with both test fuels.

Index Terms **- S.I .Engine, Copper coating, Performance, combustion characteristics**

I. INTRODUCTION

This section deals need and necessity of alternate fuels for SI engine, experimental investigations taken up by different researchers connected to this work, methods to improve the performance of SI engine, modification of combustion chamber, change of fuel composition, research gaps and objectives of the experimentation.

The large amount of pollutants emitting out from the exhaust of the automotive vehicles run on fossil fuels are increasing and these pollutants are proportional to number of vehicles. The civilization of any country is measured on the basis of number of vehicles. Hence the Government has to spend huge foreign currency for importing crude petroleum to meet the fuel needs of the automotive vehicles, in the context of fast depletion of fossil fuels. In view of heavy consumption of gasoline due to individual transport, the search for alternate fuels has become pertinent apart from effective fuel utilization which has been the concern of the engine manufacturers, users and researchers involved in combustion & alternate fuel research.

Alcohols are suitable substitutes as alternate fuels for use in SI engines, as they have properties compatible to gasoline fuels, that too their octane rating is more than 100. If alcohols are blended in small quantities with gasoline, no engine modification is necessary. Engine modification and change in fuel composition are two methods to improve the performance of the engine and reducing pollution levels.

Engine modification [1-3] with copper coating on piston crown, and inner side of cylinder head improves engine performance as copper is a good conductor of heat and combustion is improved with copper coating. The use of catalysts to promote combustion is an old concept. More recently copper is coated over piston crown and inside of cylinder head wall and it is reported that the catalyst improved the fuel economy and increased combustion stabilization.

Nedunchezhian et al.[1] evaluated the performance of a two-stroke copper coated engine (copper coating of thickness 300 microns and binding material of thickness of 100 microns on piston crown and inside portion

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Introducing Robots without Creating Fear of Unemployment and High Cost in Industries

N. Keerthi Shravani
UG Student, MED, CBIT, Hyderabad
Sri . BVS Rao,
Asst. Professor, MED, CBIT, Hyderabad

ABSTRACT:
Robots are desirable for certain work functions because, unlike humans, they never get tired; they can endure physical conditions that are uncomfortable or even dangerous; they can operate in airless conditions; they do not get bored by repetition, and they cannot be distracted from the task at hand but introducing and installing robots in industry involves huge expenditure and also creates fear of unemployment in industry.
This paper is to suggest ways to overcome the prominent issues by introducing cobot in place of robots in the and gives an analysis on the use of different cobots in the industries with varying domain functions.

1.COBOT AND COBOTICS:

A cobot is defined as a robot that has been designed and built to collaborate with humans. Cobotics is a neologism formed by the collaborative and robotics terms. A cobot can also be considered as a robot intended to physically interact with humans in a shared workspace. A workstation including a robot and a human collaborating is called a cobotic system.
They were invented in 1996 by J. Edward Colgate and Michael Peshkin, professors at Northwestern University. Cobots resulted from a 1994 General Motors initiative led by Prasad Akella of the GM Robotics Center and a 1995 General Motors Foundation research grant intended to find a way to make robots or robot-like equipment safe enough to team with people.
Cobots can have many roles from autonomous robots capable of working together with humans in an office environment that can ask you for help to industrial robots having their protective guards removed as they can react to a human presence

2.INITIAL SETUP:

Building collaborative robots takes two simple steps.

STEP 1: Choose a basic robotic platform, there are multiple options for the basic robotic platform. Vendors have varying capabilities starting from providing robot platform along with SDK (Software Development Kit) to train and teach robots

STEP 2: Programming it to do multiple tasks in a shared space with humans by adding intelligence, through multiple technology options as listed in the table below.

Table 1 : Intelligence Capabilities and Enabling Technologies

Intelligence Capabilities	Enabling Technologies
Dexterity, Self-learning, Autonomous, Interaction with surroundings, machines and humans, Location awareness, Perceive and respond.	Artificial Intelligence, Deep Learning , Object detection, Multi-Sensors/Actuators, Depth Sensing , Gesture recognition, Speech to Text - Text to Speech, Computer Vision Technologies

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Research Article

Experimental and Numerical Investigations on Crack Propagation in Titanium Alloys

Jyothirmayi Narne, Varimadugu Sandhya*, Nagini Yerramsetty and V. Jaipal Reddy

Department of Mechanical Engineering, Chaitanya Bharathi Instiute of Technology, Gandipet, Hyderabad-500075, Telangana State, India

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Abstract

The titanium alloys are the objects of wide experimental analysis in the terms of crack growth characteristics and mechanism of fracture due to their applications. The Ti-6.4%Al-2.6%Mo-1.7%Cr-0.5%Fe-0.5%Si (wt %) alloy was used in the investigation. The tensile tests were conducted on plate specimens. The test variables considered are width of tensile specimen, crack size and tensile loading. The mechanism of fracture that appeared in the specimens was established from the TEM micrographs of the replicas taken from different zones of the fracture surfaces. The mechanism of fracture was also studied using finite element analysis. The results obtained from the FEA were verified with experimental results. It can be concluded that there is a general trend of increasing stress intensity factor with increasing applied tensile load, crack size and width of the flat specimen. The strain energy release increases with increasing applied tensile load. Crack extension can occur when crack-driving force is equal to the energy required for crack growth. For a particular stress the energy release rate is proportional to the crack size. As the tensile load and the size of the initial crack increase, there is an increased crack growth in the Ti alloy. In the crack initiation zone evidence of quasi-cleavage fracture with limited plastic striations symptoms was found in the specimen tested under σ =1000MPa. Micro fracture analysis of the specimens (tested under σ=1100MPa) has revealed quasi-cleavage fracture with small symptoms of plastic shearing in the early part of cracking.

Keywords: *TEM micrographs, quasi-cleavage fracture, stress intensity factor, strain energy release, plastic shearing.*

1. Introduction

Titanium alloys are widely used for a variety of applications such as military aircraft, atomic energy and ocean components of structures due to their high strength, good thermal stability and excellent corrosion resistance. Simultaneously, the titanium alloys possesses a lot of different structures resulted from manufacturing process, heat treatment and that the fracture properties may also change. Large varieties of micro structural features observed in titanium alloys such as grain sizes, globular or lamellar type of structures, β-phase or (α+β) phase morphologies as well as bimodal structures produce different resistance to crack initiation and crack propagation of fracture. For this reason the titanium alloys are the objects of wide experimental analysis in the terms of crack growth characteristics and mechanisms of fracture.

Sergio Baragetti (2014) studied the effect of stress concentration factor and the role of different inert or corrosive environments. He found the threshold stress intensity factor after which the environment has no effect on the fatigue damage. Kuntimaddi Sadananda *et al.*, (2009) examined the role of stress range and the maximum stress in the fatigue crack nucleation and propagation. He also related this to both the stress life and fracture mechanics. Yang Cao *et al.*, (2015) used experimental – numerical hybrid method to simulate the fracture behavior of MIL composite. Chenchong Wang *et al.*, (2015) developed finite element model to study crack path and crack growth rate. Contour integral method was used to study the best thickness of austenite layer, the effect of crack propagation direction.

In this work, attention is paid on the Ti-6Al-3Mo-2Cr titanium alloy that finds applications as components of the aircraft engine. Analysis of crack growth in engine compressor disks made of this material was the subject of the work.

2. Methodology

The objectives of this work are:

- To study the fracture analysis of pre-cracked plates made of Ti-6Al-3Mo-2Cr titanium alloy experimentally.

*Corresponding author's ORCID ID: 0000-0003-3136-0888
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Influence of LASER CMM Process Parameters on Dimensional Inspection of Standard Spheres

Satyanarayana A.[1]1, M. Krishna[2], A. Chandrakanth[2], Pradyumna R[1]

1 Defence Metallurgical Research Laboratory, Kanchanbagh P.O., Hyderabad – 500 058, India
2 MVSR Engineering College, Nadergul, Hyderabad-501510

Abstract

LASER based inspection systems are widely used in precision manufacturing system in the recent years. LASER CMM in which a LASER probe attached to Co-ordinate measuring machine is capable rapid measurement of complex 3D sculptured geometry. These machines are capable of capturing large number of data points in the order of thousand of points per second with good accuracy. This inspection is non contact, suitable for fragile and soft components and it is faster and complete surface profile data available in least time. This paper describe various applications of LASER inspection for precision component like turbine blade wax pattern and ceramic core and also describes the development of land based power generation turbine blade through reverse engineering methodology.

Selection and/or Peer-review under responsibility of 7th International Conference of Materials Processing and Characterization.

Keywords: LASER CMM, Inspection, Ceramic cores, Wax patterns, Reverse Engineering

1. Introduction

LASER coordinate measuring machines (CMM) are widely used in non-contact dimensional inspection and reverse engineering applications. Reverse engineering is defined as the process of obtaining a geometric CAD model from 3D points acquired by scanning/ digitizing the existing products. LASER CMM consists of a LASER based probe head, in which LASER light falls on the surface to be measured and CCD camera mounted on head will detect the reflection. Based on triangulation principle, 3D coordinates of the surface are recorded. LASER CMMs are effectively used in Non Contact Inspection and Reverse Engineering applications. The exceptional accuracy and speed of the LASER CMM systems make them ideal for rapid inspection and verification applications. They excel at measuring gaps, sectional profiles, and feature heights, locations and overall surface comparison. The advantages of these machines includes large amount of data

* Corresponding author. Tel.: +91-40-24586818; fax: +91-40-24340683.
*E-mail address:*satyanarayana.a@gmail.com

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A hybrid PSO–BFO evolutionary algorithm for optimization of fused deposition modelling process parameters

Maraboina Raju, Munish Kumar Gupta, Neeraj Bhanot & Vishal S. Sharma

Journal of Intelligent Manufacturing **30**, 2743–2758 (2019)

Abstract

Fused deposition modeling (FDM), a well known 3D printing technology is widely used in various sorts of industrial applications because of its ability to manufacture complex objects in the stipulated time. However, the proper selection of input process parameters in FDM is a tedious task that directly affects the part performance. Here, in this work, the research efforts have been made to optimize the FDM process parameters in order to find out the best parameter setting as per the mechanical and surface quality perspectives by using hybrid particle swarm and bacterial foraging optimization (PSO–BFO) evolutionary algorithm. Taguchi L18 orthogonal array was used for the development of acro-nitrile butadiene styrene based 3D components by considering layer thickness, support material, model interior and

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Four-Leg VSI Based DSTATCOM for Compensating Nonlinear and Unbalanced Loads

S. R. Reddy, P. Prasad, G. Srinivas • Published 31 May 2018 • Engineering •
Majlesi Journal of Electrical Engineering

This paper presents a study on the four-leg VSI based distribution static compensator (D-STATCOM) for compensation of neutral, source & PCC current harmonic distortion, PCC voltage regulation and compensation of unbalanced in current waveform. This solution could be used for three-phase four-wire nonlinear and unbalanced load medium voltage distribution system. The proposed control algorithm is developed based on synchronous reference frame theory with the PI controller. The obtained reference… Expand

Figures and Tables from this paper

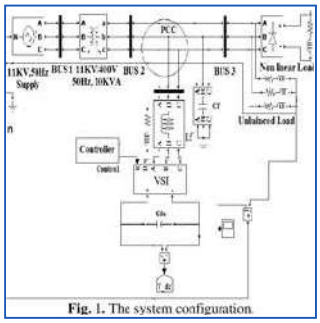
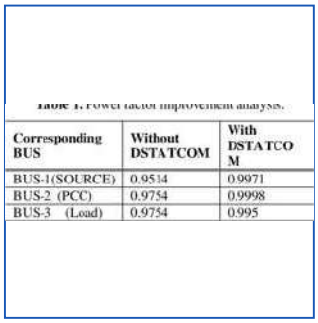


Figure 1



Corresponding BUS	Without DSTATCOM	With DSTATCOM
BUS-1(SOURCE)	0.9514	0.9971
BUS-2 (PCC)	0.9754	0.9998
BUS-3 (Load)	0.9754	0.995

Table 1

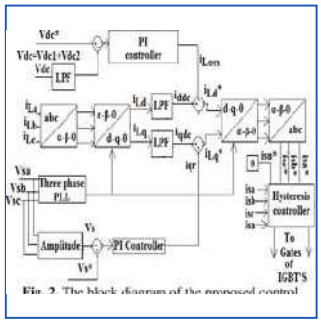


Figure 2

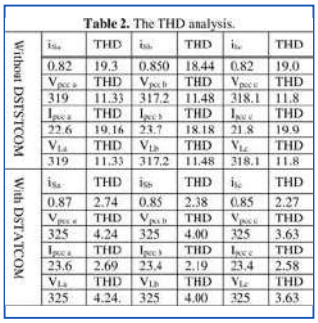


Table 2. The THD analysis.

Without DSTSTCOM	i_{Sa}	THD	i_{Sb}	THD	i_{Sc}	THD
	0.82	19.3	0.850	18.44	0.82	19.0
	$V_{pcc\,a}$	THD	$V_{pcc\,b}$	THD	$V_{pcc\,c}$	THD
	319	11.33	317.2	11.48	318.1	11.8
	$I_{pcc\,a}$	THD	$I_{pcc\,b}$	THD	$I_{pcc\,c}$	THD
	22.6	19.16	23.7	18.18	21.8	19.9
	V_{La}	THD	V_{Lb}	THD	V_{Lc}	THD
	319	11.33	317.2	11.48	318.1	11.8
With DSTATCOM	i_{Sa}	THD	i_{Sb}	THD	i_{Sc}	THD
	0.87	2.74	0.85	2.38	0.85	2.27
	$V_{pcc\,a}$	THD	$V_{pcc\,b}$	THD	$V_{pcc\,c}$	THD
	325	4.24	325	4.00	325	3.63
	$I_{pcc\,a}$	THD	$I_{pcc\,b}$	THD	$I_{pcc\,c}$	THD
	23.6	2.69	23.4	2.19	23.4	2.58
	V_{La}	THD	V_{Lb}	THD	V_{Lc}	THD
	325	4.24.	325	4.00	325	3.63

Table 2

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Design and Simulation of Three Level Neutral Point Clamped Inverter Fed Induction Motor Drive

K. Sri KavyaDurga, M. Balasubbareddy

***Abstract*—The objective of the project is to obtain some proficiency in building converters to control speed of medium voltage induction motors. The thesis covers summary of literature surveyed, selection of a topology of converter for design, design of a 3-Level NPC inverter power circuit and FOC parameters. The entire system has been simulated using PSIM software for verification of design. Results obtained are presented. Results prove that the understanding of the student (author) is satisfactory. A low voltage 10kW squirrel cage induction motor has been chosen as the load to converter for design and simulation. Future work may be design of complete control circuits implementing FOC, building complete hardware and testing the small motor chosen.**

***Index Terms*—3-Level NPC Inverter; Dynamic Modeling of IM; Losses Calculation; Scalar Control; Vector Control and IFOC.**

I. Introduction

Variable speed drives have a wide variety of applications such as pumps, fans, compressors, transportation, cement mills, rolling mills, paper mills, machine tools, robotics drives, automation etc. A few decades ago DC motors dominated the market as it is much easier to control DC motors than induction motors although induction motors are more robust and cheaper. Induction motors are used in a wide range of sizes. Larger motors are used at medium voltage (>1000V). Medium voltage induction motor drives (MV drives) in general cover voltages from 1.1 kV-13.2 kV and power from 0.5 MW-40 MW. Larger drives (up to 100kW) are usually with synchronous motor. As induction motors are singly fed, it is difficult to control speed and torque independently. Theories to obtain high performance from induction motors were developed in seventies but implementation required high speed computation and switching devices. The basic modeling of induction motor is quite established and simplified equivalent circuit model of the motor gives good performance prediction for steady state operation of the motor with sinusoidal supply voltages. But it fails good model for dynamic performance. The dynamic model of the induction motor is somewhat involved because of rotating magnetic field. The relationship of these magnetic fields depends on speed and load [1, 2].

The idea of multilevel inverter was introduced in 1975 and in 1981, A. Nabae, I. Takahashi, and H. Akagi presented the first three level inverter. In order to achieve high power, multilevel inverter used an array of semi-conductor devices with several lower DC voltage sources for power conversion resulting in stepped voltage waveform. There are two types of inverter, the two level and multilevel. A Two level inverter generates an output voltage with two levels while the minimum numbers of voltage levels in multilevel inverter are three. The increase in number of levels of the inverter will have a good output voltage waveform with reduced harmonic distortion but with increase in control complexity. A multilevel inverter has great advantages compared to two level inverter mentioned as below:

a) The output waveforms contain very low total harmonic distortion (THD) and lower dv/dt.
b) Multilevel inverter can draw input current with very little distortion.
c) They can operate at both high switching frequency as well as low switching frequency.

With several advantages multilevel inverters do have some disadvantages. As with the increase of voltage level the number of power semiconductor switches also increased so overall system becomes more expensive and complex. The NPC multilevel inverter is widely used in various industrial applications among other multilevel inverter topology. This paper presents a brief review on three-level NPC inverter topology and its modulation strategies. The major issue of this inverter topology is neutral point voltage imbalance in the DC-link capacitors is a commonly reported problem for NPC and flying capacitor type multilevel inverters. However, this does not arise when two DC voltage sources (transformer windings with rectifiers) of equal voltage are connected in series [3, 4].

The vector control can be implemented by direct called feedback and indirect called feed forward control method. The direct vector control posses more complex calculation for estimate rotor flux and unity vector. But indirect vector control posses the rotor speed is forwarded to find the unity vector and flux is estimated from the linear relationship of speed and rotor flux. The vector control decouples the three phase (a, b, c) currents into two phase (d, q) currents. Here the d-axis is the current producing magnetic field and q-axis is the current producing the torque. So the vector control method provides the performance of induction motor drive like a DC motor. It is difficult to implement complex computations are involved [5].

This paper focused about the Power circuit design of a 3L Neutral point clamped inverter for 10kW motor and as much heat is generated heat sinks are required to keep the junction temperature within limits. It is planned to use 1 air cooled heat sink for all the semiconductor devices namely three IGBT module and two rectifier modules. Losses in all semiconductor devices are calculated and one force air

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K. S. KavyaDurga, ChaitanyaBharathi Institute of Technology, Hyderabad, Telangana, India (e-mail: kavyadurga24@gmail.com).
M Balasubbareddy, ChaitanyaBharathi Institute of Technology, Hyderabad, Telangana, India (e-mail: balasubbareddy79@gmail.com)

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THREE PHASE GRID CONNECTED PV SYSTEM WITH LVRT CONTROL STRATEGY

T. MURALI KRISHNA
Assistant Professor, Dept. of EEE, CBIT, Gandipet, Hyderabad

DEEPAK GEHLOT
Manager, BHEL R&D, Hyderabad

N. ANUSHA
P.G. Student, Dept. of EEE, CBIT, Gandipet, Hyderabad

G. SURESH BABU
Professor, Dept. of EEE, CBIT, Gandipet, Hyderabad

ABSTRACT

In power system the transient short circuit faults result in low voltages in the lines. Due to this, performance of the loads connected to the grid will be affected. In order to maintain constant grid voltage during transient faults, reactive power must be controlled accordingly.

In order to supply the required reactive power during dynamic fault condition, conventionally Distribution Static Synchronous Compensator (D-STATCOM), Unified power flow controller (UPFC), Unified Power Quality Conditioner (UPQC) etc. were proposed. In order to reduce the installation and operating cost, Low Voltage Ride through (LVRT) is one of the upcoming technique to supply the necessary reactive power during low voltage condition. In this technique a Photo Voltaic (PV) system should stay connected to the grid and injects reactive power in order to maintain constant grid voltage during fault conditions. After the grid voltage recovers to its nominal value, the PV system needs to provide real power as fast as possible, so as to maintain real power balance which therefore helps the whole system recovery.

Keywords: PV system, LVRT, GRID, Short circuit faults.
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FINITE ELEMENT ANALYSIS OF POWER TRANSFORMER

Dr. N. Vasantha Gowri and Zainab Akthar
Chaitanya Bharathi Institute of Technology, Hyderabad, India

ABSTRACT

Failure in power transformer can be catastrophic to electric systems, since transformers play a vital role in the power sector. Metallic particles in transformer oil lead to Partial discharge which can result in serious conditions. The existence of conducting particle in the winding of a transformer accumulates electrical stress. Simulations are carried out for the electrical analysis of power transformer. The impact of this electrical stress on particle at different position has been analyzed in this paper.

Key words: Partial Discharge, Power Transformer, finite element method.

1. INTRODUCTION

Power Transformer being a vital element in the electrical network, is anatomized such as to protect it from any catastrophic failure. The transformer collapse can be perilous. To avoid transformer from being damaged, its testing and analysis is necessity. Studies divulge that over 85% of failure in HV equipment is due to Partial Discharge (PD).The integrity of insulation HV equipment is needed to be confirmed with PD analysis in each stage of manufacturing, commissioning for the reliability of HV winding of transformer. Analysis of PD is performed for quality assessment of the insulation. The PD analysis detects the incapacitated points in the insulation. As a part of investigation on PD, analysis of PD due to particle movement is transformer is studied using CFD [1]. Fluid flow was carried out to find the setting point of different particles. Mar Lar Myint [2] analyses the transformer through FEA for determining the electric stress. The current density for low and high voltage winding is chosen and verified through finite element indicating low voltage winding has higher current density than high voltage winding. DU Zhi-ye [3] presents the method of calculating parameter required for propagation characteristic of PD pulses in electric equipment. 2D FEM model is structured using ANSYS considering winding and transformer core made of iron. The simulation shows that maximum voltage winding decreases along the winding. Carlos M. FONTE [4] uses CFD analysis to analyse the flow distribution and heat removal in the core of a power transformer. Monte-Carlo simulation [5] is used for determining the random movement of metallic particle in HV transformer. Here, strike of particle is observed conveying that in forced oil cooled transformer indicating whether particle is touching winding which is determined by velocity of oil and random solid angle at any instant of time. Linsou Zeng [6] analyses the maximum electric field intensity and distribution of electric field at HV lead of SFP-400000/500 transformer. The result obtained from it is a reference value to insulation design of ultrahigh power transformer.

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Meta-Heuristic Technique Based Intelligent Overcurrent and Distance Relay Co-ordination with Novel Relay Minimization Technique

Roy S.[1,*], *Babu P. Suresh.*[1], *Phanendra N.V.*[1]
[1]Department of Electrical Engineering, National Institute of Technology, Warangal, Telangana, India

ABSTRACT

Relay coordination is an important aspect to maintain proper power system operation and control. Relays must be organized in such a way that every main relay should have a backup relay and co-ordination time interval (CTI) between primary and back up and different zones of the relays should be maintained to achieve proper fault identification and fault clearance sequences. The relays should operate in minimum desirable time satisfying all the co-ordination constraints. So, relay coordination is nothing but a highly constraint problem. Heuristic techniques are often used to get optimal solution of this kind of problem. In this paper this constraint problem is solved by teaching learning-based optimization (TLBO) on an IEEE 57 bus test system. Proper desirable time setting multipliers (TSM) with minimum operating time of relays are calculated. We also incorporated intelligent over current relay characteristics selection to get the desired results in this work. The results seem to be satisfactory as it is working better when compared with contemporary other techniques like Genetic Algorithm (GA) or Particle Swarm Optimization (PSO). In the later part of the paper a novel relay minimization technique is proposed based on network critical element finding and network graph theory.

Keywords: coordination time interval, over current relay characteristics, plug setting, relay coordination, teaching learning-based optimization, time setting multiplier

Corresponding Author
E-mail: saptarshi.roy.ju@gmail.com

INTRODUCTION

Relays must be organized in such a way that every main relay should have a backup relay and CTI between primary and back up and different zones of the relay should be maintained. For achieving proper fault identification and fault clearance sequences, the proper relay co-ordination is necessary. These relays should be able to differentiate between the normal operating currents and over currents due to fault conditions. During faulty conditions, these relays must respond quickly and isolate the faulty part of the circuit from healthy part and thus allow normal operation of the healthy part of the circuit. If primary relay meant for the clearance of the fault fails, backup relay must operate after providing sufficient time gap. So, backup relay must properly co-ordinate with the main relay and the flexible settings of the relays (e.g. plug setting, time multiplier setting and suitable relay operating characteristics), must be set to achieve the desired objectives.

Over current and distance relays are often used for protection of power system. Nowadays this scheme is used in almost all sub-transmission system. To achieve better co-ordination, a distance with a distance, an over current with an over current relay and an over current relay with a distance relay must be coordinated. One of them will act

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Intelligent Coordination of Overcurrent and Distance Relays using Meta Heuristic Algorithms

Saptarshi ROY[1], Suresh Babu PERLI[2], and N V Phanendra Babu[3]

[1,3]Research Scholar, Dept., of Electrical Engineering, NIT Warangal, INDIA
[2]Assistant Professor, Dept., of Electrical Engineering, NIT Warangal, INDIA
saptarshi.roy.ju@gmail.com[1], phanendra229@gmail.com[3] and drsureshperli@nitw.ac.in[2]

Abstract: Relay coordination is very important from the point of view of security and healthy operation of power system. Relays should be organized in such a way that every relay should have at least one back up relay and coordination time interval between primary and secondary relays should be maintained. This paper presents the solution of relay coordination problem using Teaching learning based optimization technique (TLBO) by utilizing an IEEE 5 bus and IEEE 30 bus test system. The obtained results are compared with the results obtained from other contemporary meta-heuristic techniques like Genetic Algorithm (GA) and Particle Swarm Optimization technique (PSO). It is observed that TLBO is the best among those with respect to process speed. After this we have done an extension of the work by introducing critical element and network graph theory based relay minimization technique. It is expected that this analysis will be helpful to maintain the network reliability and healthy flow of power.

Index Terms: Relay co-ordination, Teaching Learning based optimization, Overcurrent relay characteristics, Main backup relay pairs, minimization of the relays.

1. Introduction

Relay Co-ordination is necessary from the point of view of reliability and security of power system. Proper relay co-ordination ensures smooth and secured operation of power system. Relay co-ordination ensures minimum system disruption and continuing operation of healthy part of the circuit during operation. Thus, it is very important for protection system design. In a nutshell a protection system should be designed as follows:

Every section of the protection system will be protected by a pair of main relay and back up relay at least. A main relay is meant for the clearance of the fault. In case of failure of main relay, back up relay will take care after providing sufficient time discrimination. In some cases more than one backup relay is provided for better protection reliability of the system. The relay co-ordination problem is having several constraints. e.g- Proper co-ordination time interval (CTI) should be maintained between the main and backup relay pairs, proper intelligent relay characteristics should be chosen in case of digital relays; proper pick up current constraints, Time setting multiplier (TSM) constraints, constraints on relay operating time and constraints on plug setting multiplier (PSM) are to be satisfied. So, relay co-ordination problem is nothing but highly constraint problem. Heuristic and meta heuristic techniques are often applied to obtain optimal solution for this kind of problem. In this paper Teaching learning based optimization (TLBO) is used to solve this problem on an IEEE 5 bus and IEEE 30 bus test system. Proper desirable TSM values, optimum operation time of relays are calculated and proper intelligent characteristics of relays are also selected.

From the study of literatures about co-ordination of relays, it is found that, relay co-ordination is first implemented on over current relays. Initially it was done by using various types of linear programming techniques. e.g- Simplex , two phase simplex and dual simplex methods [1]-[4]. But there are some problems associated with this techniques. Most eminent problem regarding this techniques is no solution is available unless all the constraints regarding this problem are satisfied. So, people gradually move towards the intelligent and meta-heuristic techniques for solution of this problem. Advantage of using these techniques is they give optimal dynamic

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SPWM BASED MATRIX CONVERTER FOR INDUSTRIAL APPLICATION-MATLAB SIMULATION

K.Krishnaveni
Professor, Department of EEE, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, India

T.Murali Krishna
Assistant professor, Department of EEE, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, India

Y.Lakshmi Priyanka
U.G Student, Department of EEE, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, India

ABSTRACT

The most important processes in electrical engineering is the transformation and control of energy. This job is done by power electronic controlled converters. Good numbers of converter families have been developed such as rectifiers, inverters, choppers, cycloconverters etc. Each and every one of these families has its own advantages and limitations. One of the most attractive families of these converters is that of the Matrix Converters (MCs). Hence, it is proposed in this paper to model the Matrix Converter as Cycloconverter, Cycloinverter, Rectifier, Inverter, and Dual converter using Matlab/Simulink. Sinusoidal Pulse Width Modulation technique is used to generate the required pulses. Simulation results for different modes of Matrix converter are presented in this paper.

Keywords: SPMC, SPWM, Inverter. Cycloconverter

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A Cuk Converter Based Sag and Swell Compensation for an Induction Motor Drive

N.Usha[1], P. Venkata Prasad[2], K. Ramesh Reddy[3]
[1]*Research Scholar, EEE Dept., JNTU, Hyd.-85, India*
[2]*Professor, EEE Dept., CBIT, Gandipet, Hyd-75, India*
[3]*Professor, EEE Dept., GNITS, Hyd.-104, India*

***Abstract*- Induction motor drive is generally used in many industrial applications. These induction motor drives are sensitive to the power quality problems. In the drive system, supply is connected to the motor through rectifier, DC link and inverter. Any changes in the supply will have impact on the rectifier output and DC link voltage. The performance of induction motor is affected by the voltage sag and swells because of reduction or increase in DC link voltage of the drive system. The sudden changes in the voltage may have great influence on the overall process control of the industry which leads to high economic losses. In this paper the effects of voltage sag and swell on performance of an induction motor drive are studied and mitigation of sag and swell by using cuk converter to maintain constant DC link voltage are analyzed in the MATLAB-Simulink environment.**

***Keywords*: Sag, Swell, Cuk Converter, DC Link Voltage.**

I. Introduction

Induction motor drives find their application in many industries such as textile mills, cotton mills, sugar mills, cement mills etc. Sugar mills are usually driven by variable speed induction motors which are used to drive conveyors. In the stage of separating sugar crystals from syrup centrifugal pumps are used. These pumps are driven by induction motors specially designed to have two distinct set of stator winding. Cement mills generally employ squirrel cage motor because of their ruggedness, low cost, less maintenance and where constant speed is essential .Induction motors with flame proof enclosures are provided for driving the drills where frequency required is 150-200Hz. These frequency variable drives can be obtained by specially designed rectifier and inverter set. If there is a decrease or increase in the input voltage then there is an effect on the control of motor[1]. Motor circuit may get open during the voltage sag condition due to the contactor coil's inability to hold the contacts together effectively and also results in heat, arching and damage. The voltage sag usually results in increased currents, machine excess heating and increase in losses. The voltage swell has detrimental effects on insulation of the machine. In order to have reliable operation of the drive, voltage sag and swell must be compensated. There are many devices for sag compensation where in voltage is injected whenever there is reduction in voltage[2].

These devices are connected in such a way that the drive will not experience any change in the voltage. As there is drop in the system voltage due to sag the DC link voltage also decreases by which the inverter output also changes accordingly and drive does not operate properly[3]. If the DC link voltage is maintained constant then sag and swell effect will not be on the induction motor operation[4]. To maintain the DC link voltage constant, DC to DC converter is used for a constant DC voltage. A cuk converter is one of the DC to DC converter which responds quickly under sag and swell conditions in the drive system[5].

II. Induction Motor Drive With Sag And Swell

The block diagram of the drive system is shown in the Figure 1. Drive system consists of rectifier, DC link and inverter. Three phase Inverter is employed to get controlled output to drive the three phase induction motor at required conditions, which is obtained through a controller.

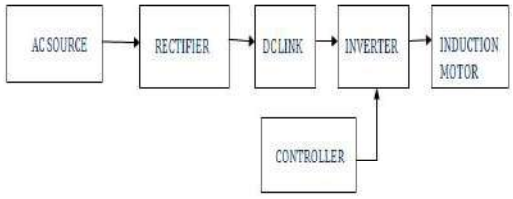

Figure 1 Block Representation of the Induction Motor Drive System

If there is sag or swell at the AC Source, the output at the rectifier changes as that of the changes at the input side and proportionate DC link voltage will appear. The drive may get tripped by the under voltage and over current protection due to sag and swell. This can be a reason to interrupt the control process of any particular application. Different types of the sags are due to the different faults and the effect of sag is reduction of the torque, increase in motor stresses and winding temperatures. Swell is caused by sudden changes in the load conditions that is when huge load is turned off in the power system. It effects the motor insulation.

Determination Of Parameters Of A Given Spv Module Using Solar Pvtr

[1]B.Prem Charan, [2]Dr.G.Suresh Babu, [3]Priyanka shukla
[1]Assistant Professor, [2]Professor, [3]Assistant Professor
[1,2,3]EEE Department, Abhinav HI-Tech college of Engineering, Hyderabad, India

Abstract: Indeed, it is undoubtedly accepted that the presence of SPV (solar photovoltaic) module is ubiquitous. The power voltage characteristic of photovoltaic (PV) module operating under partial shading conditions, under different tilt angles the output power obtained will be varied. In this paper a new method of obtaining maximum power by using bypass diode is implemented on a PVTR (photo voltaic trainer research system), such that uninterrupted output power can be achieved. The experimental results verify that the output power is varied with the varying of panel cells that are under shading area and with the change in the angle. Compared to many ways of studying the performance of a SPV module at different places, It is very convenient to study the effects that impact the electrical parameters which can be observed on a single equipment at one place named as standalone PVTR system.

Index terms: PVTR system, PV module, Bypass diode, partial shading, Pyranometer.

1. Introduction

In typical photovoltaic (PV) installations, PV arrays are formed by connecting multiple PV modules in various configurations (i.e, series, parallel, series-parallel)[1].A Bypass diode is connected in parallel with each PV module to protect the solar cells against efficiency degradation and hot-spot failure effects. When there is no effect of shade on the cells of a module or no change in the tilt angle i.e, under uniform conditions maximum power obtained will be constant. However, under partial shading conditions (due dust on the cells, shading due to trees or poles etc..) and the module subjected to change with an angle, the constant power cannot be achieved i.e, power is varied. But power output can be increased with the help of Bypass diode, for which modules are preferred to connect parallel to avoid partial shading effect.
In order to realize this concept, three hardware experiments are carried out on solar PVTR system which are discussed in the subsequent sections chronologically.

II. Experimentation

1. The effect of variation in tilt angle on PV module power

***Motivation*:** To draw the graphs of radiation Vs tilt and tilt Vs power. Tilt is the angle between the plane surface under consideration and the horizontal plane. It varies between 0-900. PV arrays work best when the sun's rays shine perpendicular to the cells. When the cells are directly facing the sun in both azimuth and altitude, the angle of incidence is normal. Therefore, tilt angle should be such that it faces the sun rays normally for maximum number of hours.

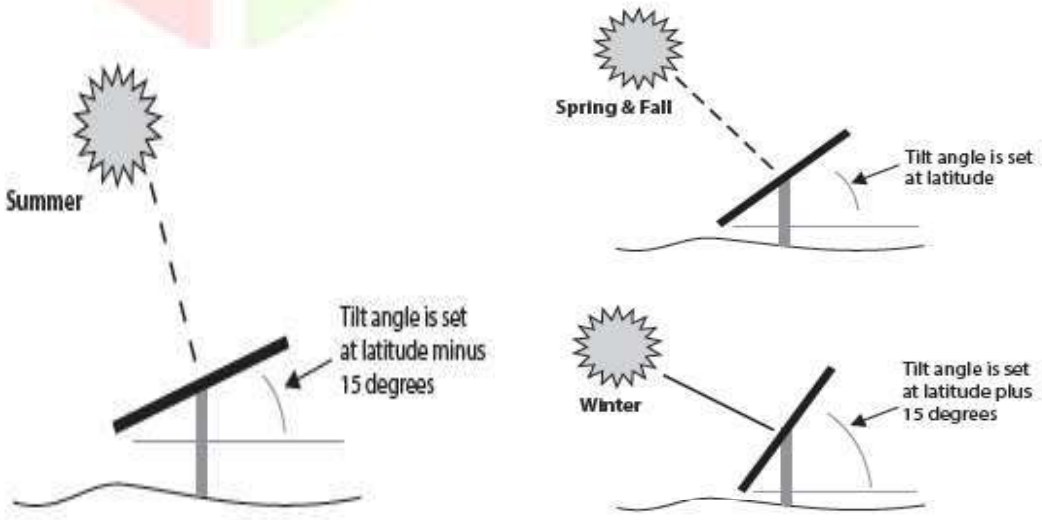

Fig.1 Tilt angle settings for different seasons

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Research paper

Performance Analysis of SPV Module Using Solar PVTR System

G. Suresh Babu[1]*, B. Prem Charan[2], T. Murali Krishna[3]

[1]Professor, Dept. EEE,CBIT, Gandipet, Hyderabad
[2]Assistant Professor, Dept. of EEE, AHTC,Hyderabad
[3]Assistasnt Professor, Dept. of EEE, CBIT, Gandipet, Hyderabad
**Corresponding author E-mail: gsb67@cbit.ac.in:*

Abstract

With a spurt in the use of non-conventional energy sources, photovoltaic installations are being deployed in several applications such as distributed power generation and standalone systems. Solar Photo Voltaic (SPV) module is the basic component of the solar PV system. The functioning of a photovoltaic array is influenced by solar insolation, shading and array arrangement. Often the PV arrays get shadowed, completely or partially by neighboring buildings, trees, towers and service poles. The efficacy of PV array unvaryingly depends upon temperature which in turn is reliant on radiation. In order to validate this hypothesis, there are certain instruments and experimentation methods available which are expensive. But carrying out hardware testing on the solar PV system with Photo Voltaic Training and Research (PVTR) system and simulating using software will lead to least economical method of achieving performance analysis which is the main objective of this paper. The efficiency of PV module is analyzed from I-V and P-V characteristics for this standalone solar PV system by changing radiation and temperature parameters. This paper mainly emphases on comparison of the testing results and simulation results for different radiation levels.

Keywords: *SPV, PVTR, Pyranometer, I-V and P-V characteristics*

1. Introduction

Any engineering process is incomplete without proper testing and analyzing. Performance analysis include (a)Hardware testing (b)Implementation in simulation environment and (c) Drawing inferences from either [1-2]. As solar generation system doesn't have any moving part, thus the required maintenance is comparatively less cumbersome. For getting the optimum output of SPV system, its regular maintenance and performance is required [3-4]. An accurate evaluation of photovoltaic (PV) system performance is important for optimizing its output [5-8]. This is an attempt to analyze the given SPV module by conducting series of hardware tests and certain simulations. The integration of hardware and simulation results will navigate the customer to select a proper SPV module which suits well to the requirement [9-15]. In this paper a standalone solar photovoltaic (SPV) module is experimented by using solar PVTR system in order to observe its behavior for various situations. All the hardware tests performed are recorded with ***Motivation*** as prefix and ***Termination*** as suffix as mentioned here after.

2. Hardware Testing

2.1 Single module with different radiation levels

***Motivation*:** To observe the effect of gradual increase in radiation level on the output power and current with I-V and P-V characteristics.

In order to obtain and plot the I-V and P-V curves of a SPV panel, the panel is inserted into the slot provided in the SPVTR system [6]. The circuit diagram to evaluate I-V and P-V characteristics of a system is shown in Fig.1.which includes PV module and a variable resistor (potentiometer) with ammeter and voltmeter for measurement. Potentiometer in this circuit works as a variable load for the module. When load on the module is varied by potentiometer, the corresponding current and voltage of the module gets changed which shifts the operating point on I-V and P-V characteristics.

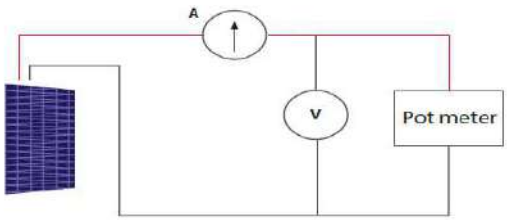

Fig.1 Circuit connections

Connections are made in the PVTR, the voltage and current readings are noted for different radiations and are tabulated as in Table 1, 2, 3 & 4. The power supplied by the panel is calculated from and figured in the last column of each table. The P-V and I-V curves for different radiations are shown in the Fig. 2 and 3 respectively.

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FINDING OF VARIOUS FAULTS BY USING PHASOR MEASUREMENT UNITS

B.Suresh Kumar[1], S.Praveena[2], K. Divyasree[3]
Associate Professor, Dept of EEE,
Chaitanya Bharathi Institute of Technology, Hyd,[1]
Assistant Professor, Department of ECE,
Mahatma Gandhi Institute of Technology,Hyd,[2]
B.E student, Department of EEE,
Chaitanya Bharathi Institute of Technology, Hyd,[3]

April 18, 2018

Abstract

This article present the liability recognition and cataloging of power electronic systems using Vector Measurement Units (PMU). A phasor is a complex number that represent both degree and phase position of sine waves found in electrical energy. Phasor dimensions that occur at the identical instance are called synchrophasor. A synchrophasor is the metered value whereas the PMU is the metering tool. PMU recognition the fault in a lesser amount of time and it also gives a time synchronized values of voltage and current in digital value. PMU gives the magnitude and phase angle of voltage and current waveforms. It takes key in from CT and PTs. The planned method has been authenticate in bus systems IEEE-9 using Simulink mode and it is corroborate under dissimilar blunder conditions like symmetrical and unsymmetrical faults.

Key Words:PMUs, synchrophasor

Power Eminence Augmentation with Hybrid Power Filter Along with Thyristor Controlled Reactor

B. Suresh Kumar, Associate Professor, Dept of EEE, Chaithanya Bharathi Institute of Technology, Hyderabad.

S. Praveena, Assistant Professor, Mahatma Gandhi Institute of Technology, Hyderabad.

Abstract--- In Power System sharing or diffusion, excellence of the power plays a very significant role. In the direction of the growth in requirement of power and it's utilization, the power value is very much disrupted. To get better the Power excellence of power supply scheme, this report presents a revise on devise of Shunt Hybrid Power Filter (SHPF) and Thyristor Controlled Reactor (TCR) compensator to diminish harmonics generated by diverse types of non-linear loads and present reactive power recompense. The small rated Active Power Filter (APF) is employed for the improvement of filtering features of the passive filter and isolate the line inductance from passive filter to let alone resonance. The TCR is tuned using a PI controller to acquire the necessary firing angle which is used to recompense the reactive power consumed by the load.

A decoupled control scheme is followed to control APF for current tracking and voltage parameter. The control system might be separated keen on an internal rapid current ring and external slow voltage loop. Integral compensators are employed in together current and voltage loops in categorize to abolish the stable condition errors. The simulation study on SHPF-TCR compensator has been implemented using MATLAB/SIMULINK software. The THD is indomitable by using FFT method in POWER GUI

Index Terms--- Shunt Hybrid Power Filter (SHPF), Thyristor Controlled Reactor (TCR), Active Power Filter (APF), Proportional-Integral controller (PI Controller), Total Harmonic Distortion (THD).

I. Introduction

Non-linear loads leads to a bunch of huge harmonic currents with feeble input power factor to belongings serious problems in the power deliver system. Conventionally, passive filters comprises of diminish power supply harmonics. Though, the apparatus suffers from resonance. In recent times, Thyristor Switching Filters (TSFs) containing of several combinations of passive filters are been by means of to recompense the reactive power. The recompense value for TSFs could be attuned by altering the load power. However, successive and equivalent resonance can take place between TSF and impedance of the arrangement. Active filters are to a large amount well-organized in compensating harmonics with high recital. But, the mechanism of active filters for significant systems is expensive and power transformers with huge nominal power ratings are necessary. Hybrid filters diminish the trouble of passive filters and execution of active filters provides an substantial harmonic recompense, in particular in the case of nonlinearities and a immense number of control strategies such as temporary reactive power, synchronous revolving position border, slippery form controllers, artificial neural network methods, non-linear control, forward control, Lyapunov function-based control and etc. have been used for the development in recital of active and hybrid filters. quite a few configurations of filters are in use to recompense the harmonics and reactive power.

An arrangement of Thyristor-Controlled Reactor (TCR) and a SHPF of resonance impedance has been implemented to eradicate harmonics, evaluation the load and reactive power management. The system control scheme depending on transforming the voltage vector to balance the negative sequence flow generated by the uneven loads. APF has been used to eradicate the current harmonics and also to remain away from the resonance between passive power filter and impedance of arrangement. In this manuscript, a new arrangement of shunt hybrid power filter (SHPF) and TCR (SHPF-TCR compensator) has been included to reduce current harmonics and reactive power recompense. Hybrid filter is a sequence combination of an active filter with a little nominal power rating and LC passive filter to ease 5th harmonic. In the key part existing arrangement, the compensation is during by the passive filter and the TCR, while APF improves the filtering exploit and damps out a resonance that can occur among the passive filter, TCR, and the supply impedance. When the shunt APF is used alone, it experiences high actual kilo voltage-ampere (KVA) by inverter that desires a lot of power savings in high dc link voltage. On the other choice, as it was accessible by lots of authors, due to passive filter routine, the paradigm hybrid power filter is

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Analysis of AC Transmission System Using Fuzzy Logic Controller for Damping of Low Frequency Oscillations with Interline Power Flow Controller

Ch.Venkata Krishna Reddy[1], G.Tulasi Ram Das[2], K.Krishna Veni[3]

[1] *Asst.Prof, CBIT, Hyderabad, Telangana, India*

[2] *Prof, JNTUH, Hyderabad, Telangana, India.*

[3] *Prof, CBIT, Hyderabad, Telangana, India.*

* *Corresponding author*

Abstract

The series compensating FACTS device Interline Power Flow Controller (IPFC) for series compensation of Active and reactive power with the unique capability of power flow management among the multiple transmission lines in transmission system. During the 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 the oscillations in load angle and rotor speed, the Fuzzy logic controller (FLC) with IPFC is proposed in this paper to improve the stability of power system. IEEE 14 bus system using IPFC with FLC is considered for analysis. Analysis is carried out using MATLAB/Simulink for different fault conditions.

Keywords: Flexible AC Transmission System, Interline Power Flow Controller , Voltage Source Converter, Stability, Fuzzy logic controller, load angle, Rotor speed.

1. 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 reaming 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 such as IGBT and GTO, now the converter based FACTS technology is finding improved application. Gyugi [2] developed Inter line power flow controller (IPFC) and its specialty is not only its multi functionality but also its controllability of multi transmission lines in large scale power system.

Sebba et al. [3] carried out with UPFC in a 2-area 4-machine system using fuzzy tuned adaptive PI controller to suppress damping of oscillations. Saoudi et.at. [4] reported with STATCOM using adaptive sliding controller capable of stabilizing an electric power system in terms of transient stability of the system and is tested on a single-machine infinite bus (SMIB) power system for symmetrical three-phase short circuit fault. Kanchanaharuthai et al. [5] carried out using advanced nonlinear control methods such as an immersion and invariance (I&I) control and a backstepping control have been applied on the power system in terms of power angle stability, frequency and voltage regulation to find transient stability.

In this paper, the FACTS device namely IPFC is used to damp power oscillations [6] with the advantages of individual control of each transmission line. IPFC is located between buses 1 and 12 of IEEE 14 bus system. The IPFC is utilized to damp the power oscillations for different faults and are further applied between buses 7 and 8 using Fuzzy controller.

In this paper, the Fuzzy Logic Controller (FLC) based IPFC designed and its performance under disturbances in damping oscillations is tested using IEEE 14 bus multi machine power system [7].

2. SYSTEM CONSIDERED TO STUDY THE PERFORMANCE OF IPFC

IEEE-14 bus system as shown in Fig 1, is considered for studying the performance of IPFC, under disturbance conditions. The details of the system are given in Appendix 1.

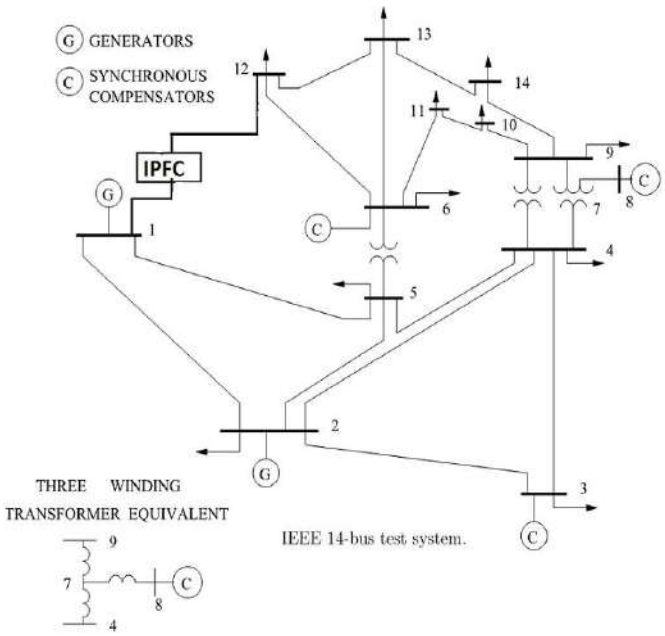

Fig.1 IEEE 14 bus test system

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Modeling and Performance Analysis of Six Level Inverter for Medium Voltage Drives

T. Murali Krishna[1], C. Harish[2], N. Anusha[3]
[1,2]*Asst. Prof.,* [3]*P.G. Scholar, Dept. of EEE, CBIT, Gandipet, Hyderabad, India*

***Abstract*—The most apt power electronic converter for control of medium voltage ac drives is a Multi Level Inverter for its inherent advantages like less Total Harmonic Distortion [THD], ease of control, low dv/dt. As the number of voltage levels present in the output voltage of the inverter is more, then the output voltage of the inverter is kept near to a sinusoidal form, resulting in smooth torque and speed. In this paper, the modeling of a six level inverter is presented and its performance is compared with five level inverter using MATLAB Simulink.**

***Keywords*— Multi level inverter, Neutral Point Clamped, Medium voltage drives, six levels.**

I. Introduction

The main cause of bearings deterioration in ac drives is large change in voltages with respect to time is the main drawback of using conventional two level inverters[1]. In order to enhance the life time of bearings and to reduce the dv/dt problem one of the possible solution is to introduce more number of levels in the output voltage of inverters[2]. Various topologies have been suggested in order to introduce number of levels in the output voltage of the inverters, out of which neutral point clamped topology has given more importance in medium drives control[3]. Recently many hybrid topologies have been evolved by cascading different conventional topologies. But they require more complex driver circuits and require less number of switching elements[4-8]. As the ease of implementation and requirement of single source, neutral point clamped topology has been preferable for speed control of medium voltage drives[9].

II. Neutral Point Clamped Topology

The basic topology to realize the multilevel inverter is neutral point or diode clamped topology in which the dc voltage is split into n levels using (n-1) series connected capacitors across the supply. This topology requires 2(n-1) uni-directional blocking, bi-directional conducting fully controlled switches per phase. The six-level NPC topology requires 5 series connected capacitors across the supply. The proposed topology of three phase six level inverter is represented in figure 1.

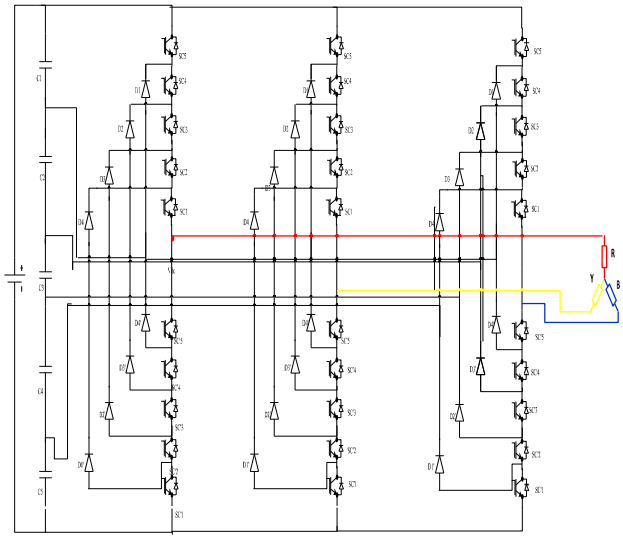

Figure 1 Neutral point clamped six level inverter.

III. Six Level Inverter

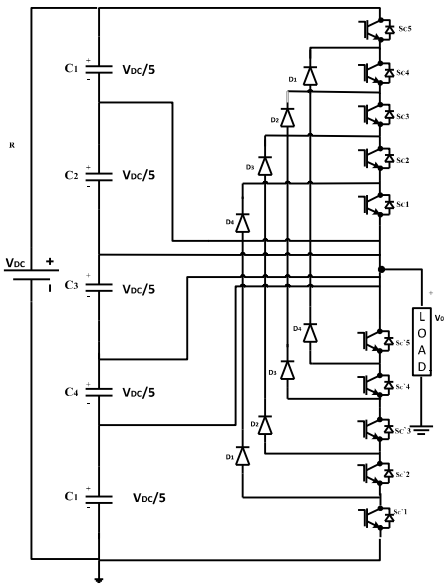

Figure 2 Single phase circuit of six-level inverter.

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Modeling and Simulation of Electrical Power Subsystem of Nanosatellite using MATLAB

[1] Dr. T. Murali Krishna, [2] S. S. Paramahamsa, [3] N. Ashwini
[1, 3] Dept. of EEE, CBIT, Hyderabad, India, RCI (DRDO), Hyderabad, India
Email: [1] tmurali5@gmail.com, [2] nashwini.anvn.92@gmail.com

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Abstract
The key part of any satellite for its proper function is the design of Electrical Power System (EPS) whose function is to provide required energy during normal as well as eclipse periods. The main function of EPS is to generate power from solar energy through solar panels mounted on the satellite surface to supply power to loads during normal period and the output voltage is regulated to charge the battery which is required to deliver energy during eclipse. This paper describes the modeling, simulation of a EPS for a Nano satellite in MATLAB Simulink environment.

Keywords: Solar cells, Direct energy transfer Batteries, Buck converter, Ćuk converter

Introduction

Nano satellites are typically defined as artificial satellites with a mass between 2.2 and 22.0 lbs. Advances in technology have allowed for lower costs in manufacturing, miniaturization of components, and increased overall utility of technology [1]. Nano satellite has a scientific payload attitude control system, communication system etc, with unique power requirements, therefore there is a need to design and develop a relatively low cost system to suit the operation requirements.

The Nano satellite considered for this simulation is a cuboid shaped and weighs approximately 4kgs which has body mounted solar panels on three sides of its six sides which are going to be deployed in the space. The other three sides are neglected because they will never face the sun or gets any illumination [2]. One of its sides i.e. the nadir side contains the payload which is the objective of the Nano satellite.

Solar energy is the only source of energy in space and the operation of the entire satellite depends on this energy. The role of EPS is to generate, condition and distribute the electrical power to the satellite loads for their functioning [3]. The EPS consists of solar panels which are connected in combination of series and parallel strings for generation. For storage, Li-ion batteries are connected to the bus which is charged during sunlit period and the energy stored is used during the eclipses [4]. For this, power budgeting is to be done so that electronic converters are to be modelled to cater the required energy to various sections of the satellite [5].

The design process of any satellite sub-system strongly depends on orbital parameters such as the type of orbit, orbital height, inclination, time spent in the sun, time spent in eclipse, average orbits per day and average orbits for the extent of the mission etc. From these calculations, the key aspects which influence the size of the battery like number of charging, discharging cycles and depth of the discharge will be determined [6].

Modeling of Electrical Power System

The functions of the power subsystem is to

a) supply continuous electrical power to the satellite during its entire mission life,
b) control and distribute power to the spacecraft and
c) support power requirements for peak and average electrical load and protect the space-craft payload operations against failures within the electrical power subsystem.

Nano satellite would have an estimated mission life of 2 years with an orbit average/peak power of 36 W. It should provide a nominal output voltage of 15V when placed at 650-800 km altitude, Low Earth Orbit (LEO).

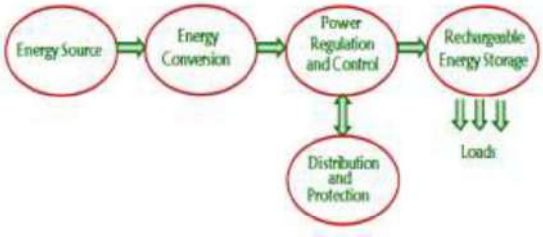

Fig. 1: Nano satellite Power System Architecture

The information regarding orbital parameters like altitude, eccentricity, inclination, local time, the resulting durations of sunlit and eclipse phases per orbit are essential in the design of EPS. In addition to this, quality of the distributed power, such as power bus service voltage range, power bus stability at load change, source impedance and interference voltages are also required.

Power Budget

The estimation of the power required by the payload and different subsystems is termed as power budget which gives an idea of how much power is required by the satellite in different operating modes during

Microcontroller Based Modeling of Three Level Neutral Point Clamped Inverter

T. Murali Krishna
Asst. Prof., Dept of EEE, CBIT, Gandipet, Hyderabad
tmurali5@gmail.com

Abstract

Multilevel inverters are the preferable converters in the design of inverter fed drives to supply an alternating voltage of controlled amplitude with variable frequency. The design of these inverters is generally requires DSP processors which increases the cost. In order to reduce the expenditure of the modeling microcontrollers are used instead of DSP processors. This paper presents the modeling of a three phase three level neutral point inverter using AT89C52 microcontroller.

Keywords: **Three Level Inverter, Neutral point Clamped, Microcontroller, SMPS**

1. Introduction

To supply an alternating voltage of variable amplitude of variable frequency with less harmonic distortion, multilevel inverters are increasing their importance in the field of power electronic converters. The most common initial application of multilevel converters has been in traction, both in locomotives and track-side static converters [1]. More recent applications have been for power system converters for VAr compensation and stability enhancement [2], active filtering [3], high-voltage motor drive [4], high-voltage dc transmission [5], and most recently for medium voltage induction motor variable speed drives [6] and for renewable energy systems [7].

2. Neutral Point Clamped Topology

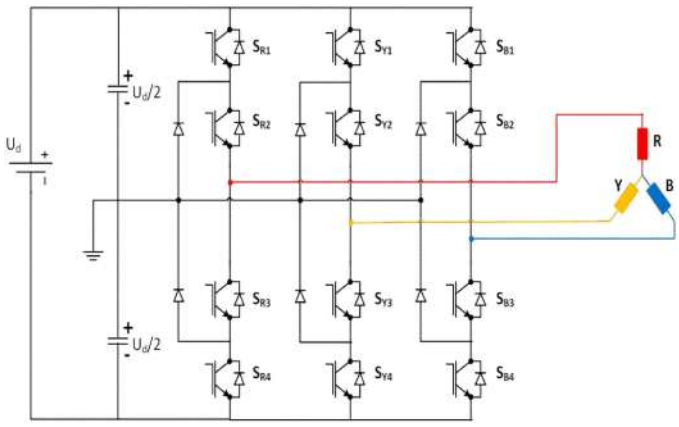

Figure 1. Three Phase Three Level Inverter Topology

The equivalent circuit to realize the three level neutral point clamped inverter is shown in the figure 1. In this topology each leg consists of four switches, two diodes. To clamp the supply voltage at two levels, two capacitors are used with their common point connected to the ground potential.

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EVALUATION OF INDUCTION MOTOR PERFORMANCE FOR THREE DIFFERENT DIODE CLAMPED MULTI LEVEL INVERTERS

T. Murali Krishna
Department of EEE, CBIT, Gandipet, Hyderabad, India

ABSTRACT

The performance of any induction motor depends on the quality of the voltage supplied to it. Multi Level Inverters are one of the solutions to provide qualitative sinusoidal voltage for the speed control of induction motor. To realize the multi level inverters, many more topologies have been suggested. Because of the ease of control circuit design and single source requirements, diode clamped topology is most preferable for the speed control applications. In this paper the design of five-level, six-level and seven-level diode clamped inverters is discussed and simulated. Their performance is evaluated on the same induction motor for analysis.

Key words: Multi level inverters, Diode Clamped topology, Induction motor, Total Harmonic Distortion.

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1. INTRODUCTION

In order to achieve speed control of induction motor, the inverters are playing a key role. But traditional two level inverters fail to provide a pure sinusoidal output voltage at their output terminals [1]. The performance of induction motor and life of bearings depends on the quality of the voltage supplied by the inverter used for the speed control. In order to cater voltage of high quality, multilevel inverter is the preferable solution. In recent years, multi level topology has gained more importance for providing a high quality sinusoidal voltage [2-3]. To meet that requirement various geometries have been experimented [4]. In addition to conventional topologies many hybrid topologies also proposed [5-7]. Out of many proposed topologies, the diode clamped topology is the basic topology not only because of its ease of devise and control circuit design but also requires single source.

2. DIODE CLAMPED TOPOLOGY

In diode clamped topology the supply voltage is divided into (n-1) levels by connecting (n-1) capacitors in series across the supply which are of same value. Each leg must consist of 2(n-1)

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Comparison of Performance of Seven Level Neutral Point Clamped and Multi Source Topologies

T. Murali Krishna[1], N. Santosh Kumar[2], D.Akhila[3] D. Balaji[4]
[1,2]*Assitant Professors, CBIT, Gandipet, Hyderabad.*
[3,4]*UG Students, CBIT, Gandipet, Hyderabad.*
Corresponding Author: T. Murali Krishna

ABSTRACT: - Multi Level Inverters are the emerging power electronic converters in the present scenario. To realize them many more topologies have been proposed. Out of which diode clamped topology is the basic topology to model them. When multiple sources are available this topology is not preferable. This paper proposes a multi source topology for modeling a seven level inverter and compares its performance with neutral point topology.
KEYWORDS: - Neutral point clamped, Multi source, Seven level inverter, THD, Topologies

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I. INTRODUCTION

In order to introduce number of levels in the output voltage of inverter many methods have been proposed. Out of which the most possible methods are to introduce more number of sources or divide the supply voltage into different voltage levels using same value of capacitors connected in series and use the power semiconducting switches to convert the dc to ac. To realize multi level inverters many conventional and hybrid topologies have been proposed. [1-8].

II. NEUTRAL POINT SEVEN LEVEL TOPOLOGY

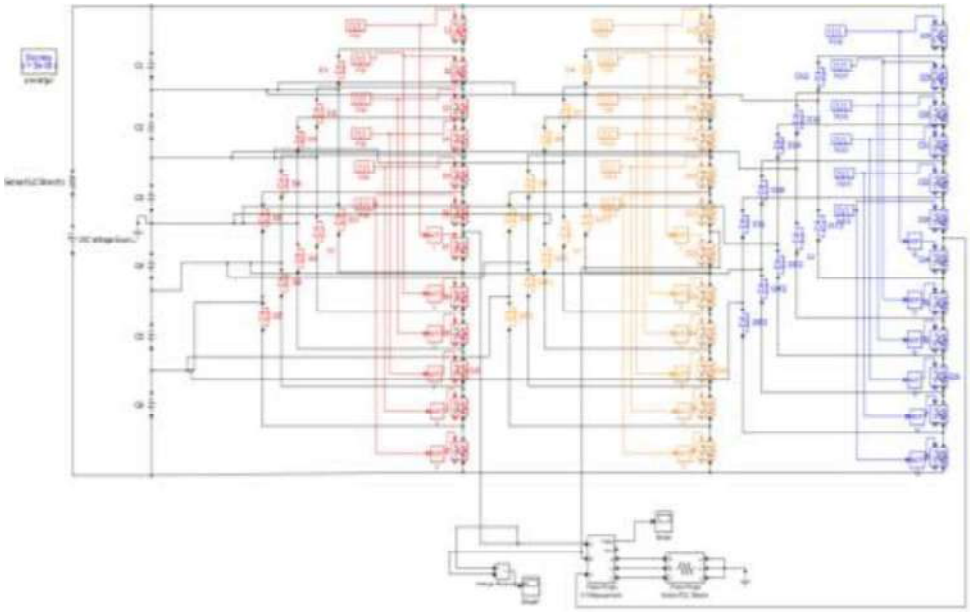

Fig. 1 Simulation circuit of Diode Clamped Seven Level Inverter.

A seven level neutral point multi level inverter requires 10 diodes, in which two are connected in each leg to clamp the voltage at a particular level. It also requires six capacitors in series to divide the supply voltage into six equal parts. The three phase simulation diagram is shown in Fig.1.

Performance Analysis of Five Level Neutral Point Clamped Inverter with and Without Pulse Width Modulation

T. Murali Krishna
Asst. Prof., Dept of EEE, CBIT, Gandipet, Hyderabad
tmurali5@gmail.com

Abstract

In the field of variable industrial drives multilevel inverters are playing a vital role in converting the dc voltage to variable ac of variable frequency voltage to achieve the desired load characteristics. In this process to supply controlled voltage at the output of the inverter five level inverters are the preferable converters. The output of these converters can be varied by applying suitable modulation techniques. This paper discusses and compares the performance of a neutral point clamped five level inverter with and without pulse width modulation techniques. The simulation is carried out in MATLAB Simulink environment.

Keywords: **Neutral point Clamped, Five Level Inverter, THD, Pulse width Modulation**

1. Introduction

In many applications like micro-grids, industries, harmonic reduction, reactive power compensation, drives control etc. multilevel inverters are given due importance[1-4]. To realize these inverters numerous topologies like diode clamped, flying capacitor, cascaded and many hybrid topologies have been discussed.[5-8] For practical execution, by considering efficiency, compact sizing, cost etc. five level inverters are more feasible because as the levels in the output voltage are more the elements required will be increased. To deliver controlled voltage at the 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.

2. Five Level Neutral Point Clamped Topology

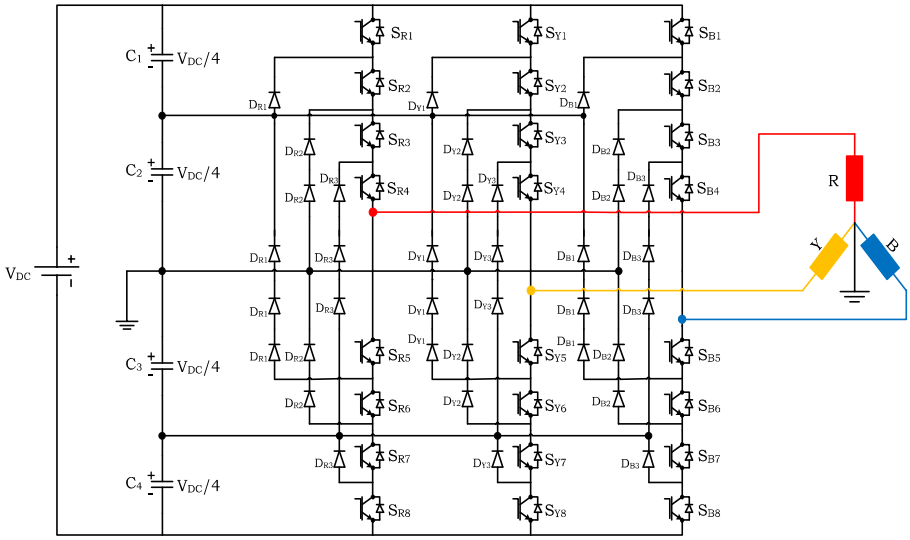

Figure 1. Three Phase Neutral Point Clamped Five Level Inverter

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MONTE – CARLO ANALYSIS OF CYLINDRICAL PARTICLE DISLODGEMENT IN POWER TRANSFORMER

N.Vasantha Gowri
Chaitanya Bharathi Institute of Technology

ABSTRACT

Transformers represent the largest portion of capital investment in transmission and distribution substations. In addition, transformer outages have a considerable economic impact on the operation of an electrical network. Power transformers are designed to transmit and distribute electrical power. There is an increasing need to move from traditional schedule-based maintenance programs to condition-based maintenance of transformers. A large number of techniques are available for transformer health monitoring. However, a focused approach is required for better diagnostics. Mineral oil is the commonly used insulation and coolant in transformers. One of the major problems in the liquid insulation is the particle contamination, which can seriously degrade the breakdown voltage of the insulation. The movement of conducting particles under operating voltage can generate partial discharge (PD) that can lead to the complete failure of the insulation system during long term operation. Hence analysis of partial discharges due to different particles is carried out. The present paper deals with the occurrence of PD using probabilistic method for different length of cylindrical like particle

Key words: Transformers, operating voltage

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1. INTRODUCTION

A power transformer is the single most costly apparatus in an electric substation. While operating in power system, it is subjected to various degrees of abnormal conditions. In order to confirm the reliability of transformer it is subjected to several standard tests prescribed by Indian and International standard to ensure its integrity over stipulated lifetime.Monte-Carlo technique is used [1] to determine the random movement of particle in radial and axial directions in a three phase common enclosure Gas Insulated Substations. Radial and axial movement of aluminum, copper and silver particles is simulated by the author. It was inferred that the axial movement of the particle is strongly influenced by given solid angle and the random movement of the particle. It is stated that when the solid angle is increased the axial

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Analysis of Particle Movement and Partial Discharge in OFAF Power Transformers Using Computational Fluid Dynamics

N.Vasantha Gowri
Assistant Professor, Department of Electrical and Electronics Engineering,
Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India.
Orcid Id: 0000-0001-5504-7699

M.Ramalinga Raju
Director, Admissions & Professor, Department of Electrical and Electronics Engineering,
Jawaharlal Nehru Technological University, Kakinada, Andhra Pardesh, India.

B.P.Singh
Professor, Department of Electrical and Electronics Engineering
St' Martins Engineering College, secunderabad, Telangana, India.

Abstract

This paper deals with movement of particle contaminants in transformer oil and partial discharges (PD) due to the existence of the particle in power transformer. Mineral oil used as coolant and insulation in transformer may have particle contaminations. These particles move along with oil in the gap between transformer discs and pressboard cylinder and between discs. Movements of particle in a power transformer are simulated using Computational Fluid Dynamics (CFD) for directed oil flow in the transformer. Point of contact between conducting particle and transformer disc during the upward movement of particle is identified by using the Computational Fluid Dynamics simulations. Electric stress developed on the particle at the point of contact is theoretically calculated. If the developed stress exceeds the permissible limit, the partial discharge is initiated. Impact of field multiplication (β) factor, which accounts the degradation of oil due to aging and other factors and the flow pattern of transformer oil are also considered for initiation of PD. From the results of simulation, it is observed that particle movement and partial discharge are influenced by type of material, oil velocity, field multiplication factor and starting point of the particle.

Keywords: CFD, Directed oil flow, Field multiplication factor, Partial discharge Particle movement, Power transformer.

INTRODUCTION

Power transformers are very important equipments placed in distribution network. Power transformers have application system in high power. Mineral oil is used as a coolant and liquid insulation in most of the power transformers. This transformer oil may have particle contaminations due to the dust particle left over inside the transformer during its manufacturing process, copper and iron particles formed due to internal sources etc,. Irrespective of filtering, these particles enter in the transformer and move freely along with the insulating oil in the winding space of the transformer. These particles may be made up of conducting materials of different sizes and shapes. Conducting particles when strikes the transformer winding may cause partial discharges. Particles are directed by the flow path of transformer oil. In some transformers, oil is guided in the winding space by placing oil guides in between disc and pressboards of the transformer to ensure the effective cooling of the transformer. In such cases, particle is also constrained to take the path of the oil from bottom entry to top. When conducting particle strikes the energized winding disc, partial discharge may get initiated. Occurrence of partial discharge is one of the major reasons for transformer failure. Many research work show that movement pattern of the particle influences the characteristics of PD. Similar kind of issues are also reported in case of Gas Insulated Substations (GIS).

Irwin et al. [1] presented a UHF based PD monitoring system for Gas Insulated substations. Several discharge patterns were identified depending on the particle movement and location. It is reported that particles in chamber wall can be easily detected by spectrum analyzer. When all the input channels are active, if particles are available at spacer surface it can be detected only by PD monitoring system. Influence of material of gaseous insulation is analyzed by Poonam et al. [2]. It is reported that percentage of SF6 and N2 in the gas mixture determines the movement pattern of particle. It is stated that the higher percentage of N2 in the mixture shows lower movement. The maximum movement is obtained at 20% nitrogen in SF6/N2 mixture and lowest movement is obtained at 90% of nitrogen. Pang et al. [3] analyzed a movement pattern of linear particle for a different lifting voltage in GIS enclosure. It is reported that the lifting voltage is low when the cavity vibrates and high when the shell does not vibrate.

In the latest work by Eslami et al.[4], motion of a conductive particle in dielectric viscous medium influenced by a DC electric field is investigated using CFD model. Up and down motion of spherical particle under DC field is analyzed. The results of the work show that the dielectric liquid ionic conductivity and the wall hydrodynamic effect are main factors in determining the movement of the particle. A work by Carlos [5] suggests that CFD is an appropriate method for analysis and this method can play a major role in design of new geometries thorough information on flow patterns.

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Research paper

Analysis of Partial Discharge Due to Movement of Spherical Particle in Power Transformer Using Computational Fluid Dynamics

N.Vasantha Gowri[1]*, M.Ramalinga Raju[2], B.P.Singh[3]

[1] *Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana State, India*
[2] *Jawaharlal Nehru Technological University, Kakinada, Andhra Pradesh, India*
[3] *St Martins' Engineering College, Secunderabad, Telangana State, India*
**Corresponding author E-mail: gowrisriin@gmail.com*

Abstract

Power transformer is costly and very important equipment in power sector. Failure of power transformer causes colossal damage to the power system. One of the important reasons for transformer failure is event of Partial Discharge (PD) in the transformer. Numbers of non-conducting and conducting particle are available in the transformer. Conducting particles available in the transformer or mineral oil entering into winding space, strike the energized winding of the transformer cause PD to occur. Movement pattern of particle administrates the probability of particle striking the winding. Analysis of movement of particles proximate to HV winding helps in understanding the occurrence of PD. This paper deals with tracking of aluminum and copper particles of various sizes available inside the transformer.

Keywords: *Power transformer, Particle movement, Partial Discharge, CFD*

1. Introduction

Power transformers are used in generation substations to step-up the generated power. Hence these transformers work with very high voltage levels. Failure of this transformer causes disturbance to entire network entire network connected to it. These transformers are well tested before they are placed in the field. Number of transformers fails in the field due to aberrant operating conditions. Partial Discharge (PD) is one of the causes for failure of HV transformers. PD is caused due to voids, gas bubbles, chemical vapor and conducting particles in the insulating system of the transformer. Mineral oil is used as fluid insulation and as a coolant in the transformers. Conducting particles in the transformer oil dislodge by the flow of oil in the winding area. When the conducting particle strikes the energized winding, it acquires electric stress formed on it. When this stress exceeds the dielectric strength of the insulating oil, partial discharge occurs. Occurrence of PD is governed by fluid flow in the transformer. As a part of analysis of PD, research works have been carried out to track the particles in the conductor space in the field of Gas Insulated Substations (GIS) and transformers. Swarnalatha et al. [1] formulated a model to simulate wire–like particle in three phase Gas Insulated Busduct (GIB) using Monte-Carlo technique. Dislodgment of particle in a crusted electrode system is calculated to be less than that in the non-coated system. Eslami et al. [2] determined that wall hydrodynamic effect and iconic conductivity of dielectric liquid are deciding the movement of the particle. Cao et al. [3] investigated the behavior pattern of magnetic particle under the two gradient magnetic fields produced by different permanent magnets using Monte-Carlo simulations. Results are found to be in line with the results of microscopic visualization. In an investigation [4], a theoretical model is created to analyze the movement of small spherical particle of 0.5 mm in transformer oil with AC field in 8 mm electrode gap. The calculated result is compared with the experimental measurement. It was reported that drag force in the transformer oil accounts for relatively closer resemblance at lower stress and dispersion at higher stress. From the theoretical results the observed behaviour of particle cloud formation and dispersion at electrical stress is in the range from 1 to 3 MV/m.

Junhao Li et al. [5] analyzed the movement of spherical particle under different applied voltages. Results show that under the given condition, the particle movement is changed from oscillations to jumping with increase in field intensity. Various PD patterns with voltage are reported at each stage. Sarathi and Koperundevi reported [6] that particle does not create partial discharge under DC or AC voltages when the particle lies over the barrier insulation. Authors measured Broadband UHF signals generated by partial discharges due to particle movement in mineral oil, at high applied electric fields. It is reported that the frequency content of the signal lies in the entire UHF range of 300 MHz - 3GHz.

This paper deals with analysis of trajectory of various particles with respect to initial position and size of the particle using computational fluid dynamics (CFD).

2. Simulation

The transformer considered for investigation is 100 MVA, 11 /132 /220 kV, three winding power transformer. This transformer consists of three windings, namely, Low Voltage (LV), Intermediate voltage (IV) and High Voltage (HV) winding. Only HV winding is considered for this analysis as voltage of the winding has high influence on the commencement of PD. HV winding of this transformer is divided into two symmetrical half coils. Hence, one half

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NEW CONTROL STRATEGY FOR LLC RESONANT CONVERTER USED IN DISTRIBUTED POWER SYSTEM (DPS)

P. Kowstubha • Published 2018 • Engineering

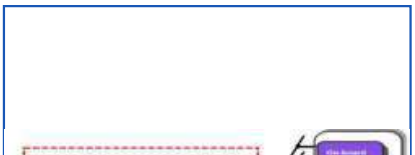
In the Power management of digital power systems, the advancements in VLSI technology have imposed major challenges such as power density and Hold up time requirement. So in this paper a better design and control Distributed Power System (DPS) is proposed. The DPS, a digital power system is tremandously used inserver applications. LLC resonant DC/DC converter was chosen as Front-end converter in DPS. In this paper, a new design technique of LLC resonant DC/DC converter using a proper selection of inductance ratio i.e. parallel to series resonant inductors (Lm/Lr), is proposed by carrying out simulation studies with MATLAB 10.0 and PSIM 6.0. A new control strategy called Pulse-Position Modulation (PPM) is introduced and proposed for LLC resonant DC/DC converter by carrying out simulation studies with PSIM 6.0 software tool. Finally, a prototype is developed for a design example of 12V, 5A output with an input voltage range of 300V to 400V was considered for the converter. A maximum output current of 5A DC with an efficiency of 94% was achieved. Collapse

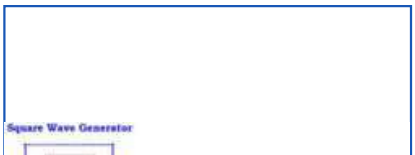
Figures and Tables

11 References

Related Papers

Figures and Tables from this paper





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CURRENT MODE CONTROL METHOD USED FOR LLC RESONANT DC-DC CONVERTER SUITABLE FOR PORTABLE APPLICATIONS

Kowstubha. P
Department of Electrical and Electronics Engineering,
Chaitanya Bharathi Institute of Technology, Hyderabad, India

ABSTRACT:

In this paper, current mode control with Pulse-Frequency Modulation (PFM) is addressed to improve the dynamic performance of LLC resonant DC-DC converters irrespective of its operating conditions. In order to improve the dynamic performance and the noise immunity, the addressed control method employs an additional feedback from the current of the resonant tank with an integrator-type compensating amplifier. In this paper, the required design guide lines along with simulation studies are presented for current mode control using PFM. Design of the converter uses Fundamental Harmonic Approximation (FHA) with highest gain adjustment. Finally, a prototype is built with 12V and 5A DC. An efficiency of 94% is found for the converter.

Keywords: LLC series DC-DC resonant converter, Pulse-Frequency Modulation, Dynamic performance, Current mode control and FHA.

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http://iaeme.com/Home/issue/IJEET?Volume=9&Issue=1

1. INTRODUCTION

The tremendous advantages of LLC resonant DC-DC converters [1]- [4] makes it popular in consumer electronics applications. their advantages over the remaining load resonant converter topologies. These converters in these applications often undergo wide variations in operating conditions. These converters when used as an off-line power supply, poses substantial variations in the output as they receive input from a power factor corrected (PFC) rectifier.

Referring to [1]- [3] a control method should be designed that could give the desired dynamic performance for the entire operational range, irrespective of any variations in operating conditions. Usually voltage mode control is implemented for LLC resonant DC-DC converters but this type of voltage regulation is not popular as it suffers practical problems [1] -

Enhancement of Power Quality in Wind Power Distribution System by Using Hybrid PSO-Firefly based DSTATCOM

M. Thirupathaiah*, P. Venkata Prasad**, V. Ganesh***

*Department of EEE, ChaitanyaBharathi Institute of Technology, Hyderabad, India

** Department of EEE, ChaitanyaBharathi Institute of Technology, Hyderabad, India

***Department of EEE, JNTUA College of Engineering Pulivendula, Andhra Pradesh, India

(*m.thirupathy@gmail.com, **pvp_reddy@yahoo.co.uk, ***ganivg@gmail.com)

‡Corresponding Author; M. Thirupathaiah , Department of EEE, ChaitanyaBharathi Institute of Technology, Hyderabad, India, Tel: +91 9963181845, m.thirupathy@gmail.com

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Abstract - Electricity generation, electric power transmission and final distribution to an electricity meter are some of the processes performed in the industry of electric power. Power quality is an important factor to show the wellness of electric power. Due to the changing behavior of power generation in wind systems, more power quality issues may occur. This paper presents the simulation and analysis of Distribution Static Synchronous Compensator for voltage sag mitigation, harmonic distortion and power factor improvement using the control strategy named hybrid PSO-Firefly algorithm. The hybrid control strategy effectively enhances the performances of Distribution Static Synchronous Compensator in order to provide the faster and dynamic response. By utilizing the novel control strategy the compensation in the proposed work was completely admirable when compared with the existing techniques like proportional integral and derivative controller and proportional integral and derivative-particle swarm optimization control. The reduction of harmonics achieved to a lower percentage as 1.216 in the proposed work. The operation of simulated control method for Distribution Static Synchronous Compensator is performed in MATLAB SIMULINK.

Keywords: Distribution Static Compensator (DSTATCOM), Firefly, Particle Swarm Optimization (PSO), PID Controller, Wind distribution system.

1. Introduction

One of the basic needs of every country is electricity which is a prime sector in countries. The electric power expected by the client is inheritable through transmission units and provided to the individual clients. It is necessary to satisfy this need with high level of power quality [1]. The power quality is the term coincident with stable supply of power. For the continuity of electric power supply number of techniques are utilized in the power distribution system [2]. One of the solutions for the continuous power supply is the incorporation of renewable energy resources to the power system [3].

Among the different kinds of sources the wind and solar are the most desired sources of energy. The issue related with power quality is either linked up with components of the system or the consumers of the distribution system [4-6]. To secure a harmony amongst free market activity in the power distribution system the wind turbines need to work together with whatever is left of the creation units in the system so as to make it feasible for the distribution system [7-8]. The nature of supply joining with the wind power systems is still a swaying issue [9-10]. The power quality issues in a distribution system are considered in three levels such as generation, transmission and distribution [11].

With the increasing penetration of renewable energy sources, particularly wind energy, as well as the growing percentage of power electronics-based devices and plants in

Millimeter Wave Systems for 5G:Design Principles, Challenges Opportunities, and Solutions

Dr K. Venkata Murali Mohan
Professor in ECE Dept.
Holymary Institute of Technology & Science,
Bogaram(V),
Keesara(M),Hyderabad.

V.Krishna
Assoc. Proff. in CSE Dept.
Holymary Institute of Technology & Science,
Bogaram(V),
Keesara(M),Hyderabad.

B.Pulla Rao
Asst. Proff. in ECE Dept.
Holymary Institute of Technology & Science,
Bogaram(V),
Keesara(M),Hyderabad.

Dr D Krishna Reddy
Professor in ECE Dept.
Chithanya Bharathi Institute of Technology,
Gandipet, Hyderabad.

ABSTRACT: *Millimeter wave (mmWave) systems promise to produce a multi-gigabit transmission rate, offers a versatile and cost-efficient candidate for 5G backhauling however their sensible implementation faces many hardware challenges compared to sub-6 GHz communication systems. These hardware constraints will seriously undermine the performance and readying progress of mmWave systems and, thus, necessitate disruptive solutions within the cross-design of analog and digital modules. In this article, the key challenges for mm-wave air-interface are initially mentioned. After wards the importance of various hardware design constraints were discussed in detail for a completely unique system design to achieve higher performance for future millimetre wave communication systems. The characteristics of the projected design are articulated very well, and additionally facilitate various research activities in both industry and academia, paving the way for successful future 5G mobile communication networks.*

KEYWORDS— Millimeter wave, 5G, beyond 6 GHz, air-interface, radio interface, waveform, channel code, retransmission scheme, frame structure, numerology, multiple access, duplexing schemes, initial access

I Introduction

The wireless traffic demand is growing very quickly due to new services like Ultra-High-Definition (UHD) Videos, video game (VR) etc. A 1000-fold increase of the wireless traffic has been expected [1]. Millimeter-wave (mmWave) systems avail of extremely massive bandwidth, therefore boost the peak data rates and improve the user experience. For this reason, they have been identified by catalyst for the next generation wireless communication systems [2]. The corresponding explosive growth of data rate demand for 5G and therefore the "spectrum shortage" condition within the sub-6GHz frequency range [3] have created it imperative for the mobile communications industry to explore millimeter - wave (mm- wave) bands. So as to hurry up the unbeaten roll-out of mmWave systems and promote the evolution of mobile internet, a good quality of research has been reported in the literature as well as channel modeling [4], design of air interface and best possible transceiver algorithms [5], beam training and tracking [6], system prototyping[7], etc.

mmMAGIC (Millimetre-Wave based Mobile Radio Access Network for Fifth Generation Integrated Communications)[8] is a European project wherever analysis is performed on crucial parts planning to develop novel radio access technologies for mobile communication within the frequency vary 6-100 gigahertz. One of the major objectives in mmMAGIC is to design a unique mm-wave air interface that fulfils the key performance indicators (KPI's) associated with social and operational 5G system needs, like user rate in downlink (DL) and transmission (UL), traffic density, mobility, handiness and latency, etc. However, the planning of a mm-wave air interface could be a difficult task. 6 GHz wireless systems, communication over mmWave frequencies experiences substantially different characteristics, like higher path-loss, stronger directionality, and bigger bandwidth. Yet, the major challenge pertaining to the implementation of mmWave systems is that the exacerbated impact of hardware constraints compared to current frequency (RF)-based systems. Further, with increasing frequency, signals suffer severe hardware impairments, like phase noise. In addition, electronics settle down energy economical and therefore the larger information measure ends up in terribly high demand on signal process capability.

POWER EFFICIENT METHOD TO IMPROVE THE TRANSIENT BEHAVIOR OF THE VOLTAGE REGULATOR FOR HIGH SPEED APPLICATIONS

A. Krishna Kumar[1], D.Deepika[2]
[1]Asst. Prof, Chaitanya Bharathi Institute of Technology, Hyderabad
[2]Asst. Prof, Mahatma Gandhi Institute of Technology, Hyderabad

ABSTRACT

The presented paper provides a solution to improve the transient behavior of the voltage regulator. A voltage regulator is a power efficient way of stepping down an external supply voltage to the desired internal core supply voltage. The final output stage (i.e. driver stage) is the most important and critical block of a voltage regulator. The driver stage should have reasonably good bandwidth to achieve good transient performance. Fast transient response 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 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 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.

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Emotion recognition in speech signals using optimization based multi-SVNN classifier

Kasiprasad Mannepalli [a,*], Panyam Narahari Sastry [b], Maloji Suman [a]

[a] Associate Professor, K L University, KLEF, Vaddeswaram, Vijayawada, Guntur (Dist), Andhra Pradesh, 522502, India
[b] Professor, CBIT, Gandipet, Hyderabad, Telangana 500075, India

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Imperialist Competitive Algorithm

ABSTRACT

Emotion recognition is an interdisciplinary area, and it achieves a significant attention of the researchers in the past few years. Automatic recognition of an emotional state intends to attain an interface among the machines and human beings. Accordingly, a speaker emotion recognition system, named Fractional Deep Belief Network (FDBN), is designed in the literature using fractional deep belief network that combines fractional theory and deep belief network. This work introduced a novel emotion recognition scheme, Whale-Imperialist Optimization algorithm (Whale-IpCA) based Multiple Support Vector Neural Network (Multi-SVNN) classifier, for identifying the emotions in the speech signal. The newly proposed Whale-IpCA algorithm hybridizes the Whale Optimization Algorithm (WOA) and Imperialist Competitive Algorithm (IpCA), and it trains the Multi-SVNN classifier for identifying the emotions. Also, the spectral feature set is extracted from the input signal and provided to the proposed Whale-IpCA based Multi-SVNN for the recognition purpose. Simulation of the proposed Whale-IpCA based Multi-SVNN is done with the help of the standard emotion databases, such as Berlin and Telugu. From the results, it is evident that the proposed Whale-IpCA based Multi-SVNN classifier has surpassed other existing works with the values of 0.0025, 0, and 0.9987 for the FNR, FPR, and accuracy, respectively.

1. Introduction

Speech signals play a vital role in expressing the emotions of the speaker. Recent researchers have concentrated on recognizing the emotions from the speech signal since it makes a way for building the artificial intelligence system (Zhang et al., 2017). Several fields, such as pattern recognition and artificial intelligence, have used the emotion recognition scheme for building the human-machine interaction. The emotions in the speech signal vary based on the speaker style; also the presence of longer duration speech corresponding to single emotions diminishes other emotions (Sun and Wen, 2017). Hence, it is necessary to analyze the emotions in the speech signal for varying frame length. Speech Emotion Recognition (SER) (Le and Provost, 2013) is the way of extracting the emotions in the speech signal, and the basic steps involved in the SER are feature extraction and the emotion recognition. SER identifies the affective state of the speaker by recognizing the emotions in the speech. Incorporating SER in the artificial intelligence fields makes the human-machine interaction to be more natural (Badshah et al., 2017). Identifying suitable emotions present in the speech through the emotion recognition system helps the speech analysis system, and thus, applications, such as intelligence, and surveillance, benefit through the SER (Cao et al., 2015). The speech signal considered for the emotion recognition contains the collection of utterances, and each utterance in the speech signal has an emotion. Hence, the emotion recognizer needs to consider the emotions hidden within each utterance of the speech. Also, the emotional content in the speech varies based on the culture and the environment (Ghai et al., 2017).

One of the important considerations for the emotion recognition is the extraction of the suitable features, which state the emotion of the speaker. Extracting the features fills the research gap between the identification of different emotions in the speech signal. Use of the hand designed features (Anagnostopoulos et al., 2015; Deng et al., 2017) have proved to be insufficient in discriminating the emotions in the signal. Hence, it is necessary to utilize

* Corresponding author
E-mail address: mkasiprasad@gmail.com (K. Mannepalli).
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Sensors signal processing

Dither Signal Filtering in Ring Laser Gyroscope Using Modified Stockwell Transform

Bharath Regimanu[1], Kishore Chandra Das[2], Kakarla Subba Rao[1], and N. V. Koteswara Rao[1]

[1]Chaitanya Bharathi Institute of Technology, Hyderabad 500075, India
[2]Research Centre Imarat, Defence Research and Development Organisation, Hyderabad 500069, India

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Abstract—Ring laser gyroscopes (RLGs) are widely used in many airborne and navigation systems for accurate measurement of the true rotation of the body movement, but the RLGs suffer a serious problem at low frequencies known as lock-in frequency. To avoid the lock-in problem, the RLG is vibrated mechanically to a high frequency, which is known as dithering. In order to get the true rotation of the body, the dither signal has to be removed. Normally, digital filters are used to remove the dither signal. These filters have the disadvantage that either the filter length is too large or the phase characteristics are not linear. The Stockwell transform and the modified Stockwell transform (MST) are widely used for the analysis of signals. In this article, the MST is used as a filter to filter the dither signal, which is attenuated by 114.5 dB.

Index Terms—Sensors signal processing, dither signal, notch filter, ring laser gyroscope (RLG), S-transform.

I. INTRODUCTION

A ring laser gyroscope (RLG) uses the concept of differences in frequencies to detect rotation. The basic principle of an operation is based on the concept of the Sagnac effect, which displaces the nulls of the internal standing wave pattern in response to angular rotation. The RLG has high sensitivity and stability. Among all the gyroscope technology, the RLG has inherently best scale factor stability of 0.1 ppm [1]. In spite of the fact that RLGs are very large and heavy, they are proven to have more accuracy than traditional rotating mechanical gyroscopes. Presently, the RLG has achieved accuracy of 0.00015 °/Hr. Also, the reaction time to respond to rotation rate is very quick. Furthermore, the RLG is insensitive to acceleration and immune to environmental effects [2]. In addition, it provides digital linear output with angular rotation. However, RLG has limitations when the rotation rates are low, resulting in a zero sensed output, which is termed as lock-in effect.

II. RLG AND ITS WORKINGS

The RLG uses the property of Sagnac effect to measure the angular rate [3]. In a Sagnac interferometer, two oppositely directed light beams, i.e, clockwise (CW) and counter clockwise (CCW), arising from same source propagate inside the interferometer along the same closed path. At its output, a fringe pattern is produced with the interference of CW and CCW waves, which shifts if a rotation is applied along an axis perpendicular to the plane of beam path. The two (CW and CCW) beams undergo a relative phase difference proportional to the rotation rate Ω. With respect to inertial space, the two counter-propagating light waves take different times to complete a trip around a rotating closed path. Therefore, this results in a difference in the optical path, which is indicated by the fringe pattern due to the interference of two beams. During angular movement of the aircraft, or any other vehicle it is mounted on, the angular rate is measured by determining the frequency shift in the beams. The difference in frequency between the two traveling waves is called beat frequency Δf

$$\text{where } \Delta f = 4A\Omega/L\lambda \tag{1}$$

where

A area of ring cavity;
L path length of laser light;
λ wavelength of the light in lasing medium;
Ω angular rate of rotation.

The ratio $4A/L\lambda$ is known as scale factor of gyro. The beat frequency is directly proportional to the rate of rotation Ω.

III. LOCK-IN EFFECT AND TECHNIQUES TO AVOID

At low rotation rates, the difference in frequency between the two light beams causes injection locking, which occurs when the two waves with close frequencies become almost identical. The region of the input–output characteristics of RLG, where sensed output is zero for low input rates, is called the lock-in zone. This means that within this value, the RLG will not be able to detect angular rate. Beyond this lock-in rate and up to the lock-in region, the scale factor becomes highly nonlinear [4], [5].

Mechanical dithering is the commonly used method to eliminate lock-in. Mechanical dither is given by rapidly moving the gyro through the lock-in region. The common scheme uses sinusoidal motion about the gyro input axis with amplitude more than lock-in band. The frequency at which the RLG is mechanically vibrated is known as the dither frequency. The dither frequency depends on the RLG used. Generally, the dither frequency varies in the range from 350–500 Hz. This makes the gyro remain out of the lock-in condition. Hence, the

Corresponding author: B. Regimanu (e-mail: bharathregimanu@gmail.com).
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Comparison of TEC Estimation Techniques using S1 and L5 Signals of IRNSS

Q. J. Mohd ✉, D. S. Achanta, V. K. R. Nalam & T. K. Pant

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Abstract

Indian Regional Navigation Satellite System (IRNSS) is a satellite based navigation system developed by Indian Space Research Organization (ISRO). The positional accuracy of IRNSS is limited by several errors including ionospheric delay. Ionospheric delay can be estimated with precise calculation of total electron content (TEC). However, TEC is biased by multipath and thermal noise. Therefore, multipath and thermal noise free relative TEC measurements are made and compared with two other methods, namely, code TEC and IRNSS Receiver Software (IRS) techniques. In this investigation L5 (1176.45 MHz) and S1 (2492.028 MHz) signals from IRNSS 1A to 1G satellites are considered. The results indicate that relative TEC estimation technique removes the

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Research paper

Interactive Natural Image Segmentation and Foreground Extraction

Y. David Solomon Raju[1*], D. Krishna Reddy[2]

[1]*Research Scholar, Department of Electronics and Communication Engineering, Rayalaseema University, Kurnool.*
[2]*Professor, Department of Electronics and Communication Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana State, India.*

Abstract

Interactive image segmentation is very practical and important problem in computer vision. In this paper a regressive based Green's function is employed to formulate the problem of segmentation. The method is incorporated with different clustering approaches intended to extract the foreground regions from the natural images. The method performance is improved with proper labeling of foreground and background regions, and with more number of cluster regions. The method is evaluated with two standard benchmark datasets and found that the experimental results were promising.

Keywords: *Segmentation, foreground extraction, clustering, green'sqpolynomial function.*

1. Introduction

Interactive and semantic image segmentation approaches have attained greater interest in the field of computer vision and deep learning. The work finds its own application in real time world where large labeling is not possible and needs heavy labor [1]. During the past decade many interactive based image segmentation algorithms were proposed such as level set [2], Snakes [3], Watershed [4], Random walkers [5], Graph cuts [6] and many others. In spite of many segmentation models the problem of segmentation for natural images is still in demand.

Interactive segmentation involves a minimal user interaction intended to extract user defined regions and the results obtained with this approach are more accurate than those of automatic image segmentation. This interactive segmentation involves two major requirements (i) It should be able to extract the users required region of interest (ii) It also to be efficient in achieving the considerable feedback. User intuitiveness is carried till the desirable results are achieved. In this method the region of interest are labeled with mouse dragging and it doesn't not require any boundary markings as in the case of [2] [3].

The problem of this labeling can be also termed as the problem of classification, and this interactive-ness can be termed as semi supervised classification. Some of the algorithms like label propagation with local and global consistence [7] and [5] may not be able to produce satisfactory results for natural images.

In this paper, interactive based image segmentation (label classification) is proposed and formulated as a Green's polynomial function.

A clustering approach is employed to partition the image different labeled region which is further refined by a regression based linear polynomial expression. The paper is organized as, section 1 presents the need and the necessity of the natural image segmentation.

2. Related Work

In general the label propagation proposed by Wang in [8] formulated the problem as a optimization solution represented as

$$min(f^T Mf + \gamma(f-y)^T D(f-y)) \quad (1)$$

In the above equation (1) the variable 'f' is related to the class labels of all the data , 'y' represents the class labels of the labeled data and 'D' is the diagonal matrix whose elements are '1' for labeled data and '0' for non labeled data , lastly the parameter γ is a trade off parameter. The main task is to construct the matrix 'M'.

To achieve this, the splines developed in [9] are used replace the linear kernel function and models an interactive segmentation through spline based regressive process. The spline here is a combination of polynomial and Green's function that are used to interpolate the scattered data in geometrical coordinates. As per the work done in [1], it was observed that the matrix 'M' is Laplacian framework and can be obtained by summing the losses estimated from the neighborhoods.

In this paper, a two class labeling is considered, where the class label f_i, of x_i belongs to the two valued label L={+1,-1}. For each point of data $x_i \in X$, its "k" number of neighbors are selected based on the Euclidean distance then those closest data points can be represented as $N_i = \{x_{ij}\}_{j=1}^{k}$, where the 'j' stands for the index and the next objective is to model a function that can route the data points to its labels , that can be represented as $f_{ij} = g(x_{ij})$ Where j=1,2,…k.

For the above expression, the regression task can be modeled with a data fitting and smoothing function

$$J(g) = \sum_{j=1}^{k}(f_{ij} - gi(x_{ij}))^2 + \lambda S(f) \quad (2)$$

FPGA Based Design and Implementation of MicroATM

P. Sriravali
M.E
Department of ECE
Chaitanya Bharathi Institute of Technology
Hyderabad, India

Sri. J. Balakrishna
Assistant Professor
Department of ECE
Chaitanya Bharathi Institute of Technology
Hyderabad, India

Abstract— The major problem, faced by villages in India is the lack of ATMs. To overcome this problem, Micro-ATMs have been introduced. The Micro-ATM is used to access bank accounts in order to make cash transactions. This is a portable ATM that can help provide cash transactions to villagers.

In this paper the design of Micro-ATM is done using Verilog HDL that synthesizes cash withdrawals, deposits and balance enquiry. A card is required to access the Micro-ATM for further transactions.

The Micro-ATM serves one customer at a time. A customer will be required to enter the Card Number, Personal Identification number (PIN) - both of which will be sent to the database for validation as part of each transaction. The customer will then be able to perform one or more transactions. Also customer must be able to make a balance enquiry of any account linked to the card. If a transaction fails for any reason other than an invalid PIN, the Micro-ATM will display the error, and will then ask the customer whether he/she wants to do another transaction.

Keywords—Micro-ATM; Verilog HDL;

I. INTRODUCTION

The Micro-ATM device was originally described at a high level in a vision document by UIDAI titled "From Exclusion to Inclusion with Micropayments". It is meant to be a device that is used by a million Business Correspondents to deliver basic banking services at the last mile. A committee consisting of IBA, UIDAI, NPCI, IDRBT, RBI and various banks was created to define the specifications and use cases of this device, which are presented here. The costs of not standardizing a device like the Micro-ATM are quite high; large sections of Indian society will continue to be left out of the country's financial system. The telecom industry is widely regarded for relentlessly driving down costs and bringing coverage to large parts of the Indian population. Similar success is possible in the payments industry. The Micro-ATM is a first step towards providing an online, interoperable, low-cost payments platform to everyone in the country. The Micro-ATM device design and system architecture are influenced by the design of debit/credit card processing on Point-Of-Service (POS) terminals, combined authentication services that UIDAI will provide. The Micro-ATM is deployed by banks either directly, or through service providers. It is operated by individuals who are business correspondents themselves (individual BCs), or are sub-agents of a corporate BC. The Micro-ATM standards are broad-based, standards-based, and generic. They are based on a bank-led model for financial inclusion, where the UID infrastructure is an overlay on the existing banking infrastructure.

The basic transaction types that the micro-ATM will support are:

i) Deposit
ii) Withdrawal
iii) Funds transfer
iv) Balance enquiry and mini-statement

The objectives of these specifications are to:

i) Bring down transaction costs
ii) Ensure interoperability
iii) Ensure security and transparency of transactions
iv) Bring down the cost by being compatible with existing systems
v) Provide a uniform customer experience
vi) Reduce agent training needs

This project describes the following, to achieve the stated objectives:

i) High-level system architecture for micro-ATM transactions
ii) Roles of various participants
iii) Supported transaction types
iv) Functional requirements for micro-ATMs
v) Minimal hardware requirements
vi) Interoperability

II. LITERATURE SURVEY

According to World Back, roughly 2 billion people around the world do not have access to formal sources of banking and financial services, or more than 50% of small and medium-sized businesses worldwide lack adequate access to credit. However, financial services to poor and rural people have many limitations including lack of security and high operation costs. As a result microfinance was developed as a cost effective and sustainable way of expanding outreach of the banking system to the rural area with the goal of setting financial inclusion and equality. One effective tool to reach deeply into rural areas is micro-ATM. Micro-ATMs which is similar to a POS (Point Of Sales) has its functions like a normal ATM such as: cash withdrawal, cash deposit, balance enquires and other functions based on each Microfinance Institutions. It has now become a national priority to rapidly accelerate progress toward financial inclusion and ensure safe, secure, sound, efficient access to basic financial services for all residents. Towards this end, a UID-enabled micropayments system is being conceived, which will be based on networks of agents managed by banks.

It has now become a national priority to rapidly accelerate progress toward financial inclusion and ensure safe, secure, sound, efficient access to basic financial services for all residents. Towards this end, a UID-enabled micropayments system is being conceived, which will be based on networks of agents managed by banks. These agents will perform financial transactions using Micro-ATMs. A variety of financial services can be offered once a UID-enabled micropayments platform is available throughout the country. Several last mile collection problems can be solved with

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Research pape

Segmentation of Medical Images with Intensity Inhomogeneity using Multiphase Level Set Functions

V. V. Satyanarayana Tallapragada[1]*, G. V. Pradeep Kumar[2], M.Venkatanaresh[3]

[1]*Associate Professor, Department of ECE, Sree Vidyanikethan Engineering College, Tirupati, India*
[2]*Assistant Professor, Department of ECE, Chaitanya Bharathi Institute of Technology, Hyderabad, India*
[3]*Assistant Professor, Department of ECE, Sree Vidyanikethan Engineering College, Tirupati, India*
**Corresponding author E-mail:satya.tvv@gmail.com*

Abstract

In this paper, concurrent segmentation and bias removal is proposed on magnetic resonance images with intensity inhomogeneity. Intensity inhomogeneity is basically a smoothest variation, which makes a homogeneous region of intensity an inhomogeneous. Inhomogeneity leads to poor performance of image processing algorithms in particular, in medical image processing algorithms. In this paper a level set function based solution is proposed with a variety of control over the inhomogeneity. The intensity of an individual region is modelled using Gaussian distribution with mean and variance that spatially vary. The distribution overlap between different regions is suppressed significantly using a new intensity domain. An ML function is defined for every point on the newly defined domain and a level set is formulated. The proposed method is found to be initialization robust hence can be used readily for applications and also has an extra facility in terms of iterations to exploit thinner sharper boundaries.

Keywords: *bias correction; image segmentation; intensity inhomogeneity; level set function.*

1. Introduction

The deficiencies in imaging devices and scanning procedures often results in intensity inhomogeneity in images. It can be usually modelled as soft/smooth field, which varies spatially. This is smooth field gets multiplied with the original signal of same matter in the image. The field varying spatially is termed as bias field. The aim of the works in this line is to predict this bias field and with this predicted bias field restoring the original image by that removing the effects of intensity inhomogeneity. This broadly called Bias correction [1][2]. The intensity inhomogeneity in MRI arise from the non-uniform magnetic fields formed by RF coils as well as from deviations in object openness [3]. Intensity inhomogeneity has to be dealt with more intricate models than piecewise constant models. Vese and Chan [4] and Tsai individually proposed two like region-based models for general images. Both the models which are basically aimed to minimize the Mumford–Shah functional, treats segmentation of an image as a task of calculating the best approximation by a piecewise smooth function.

These models were then widely called to be piecewise smooth models, and exhibited assured competence to handle intensity inhomogeneity. However, the piecewise smooth models are computational extensive and undergo other difficulties. Michailovih proposed an active contour model by utilizing the Bhattacharyya difference between the intensity distributions inside and outside a contour [5]. This model does not depend on the intensity homogeneity, hence overcome the limitation of piecewise constant models. The segmentation based bias correction models are of most attractive of different kinds of bias correction schemes. Parametric models based on maximum – likelihood or maximum–a–posterior probability is widely used to unify bias correction and segmentation [1], whose parameters can be calculated using an expectation maximization algorithm [2][6].

But, this kind of algorithms have severely affected by the variable initializations [7][2]. Hence these schemes cannot be used in applications where automatic segmentation is needed. A number of other techniques on bias correction and segmentation are proposed in the literature [8-13]. Li et al. proposed a level set method to perform concurrent segmentation as well as bias correction, which has many benefits [1]. These incudes robustness to initialization and decent approximation to bias fields of general contours [1]. This level set method is originally inspired from weighted K-means clustering [14], hence it is termed as weighted K-means level set (WKLS) method. But, this method is shown to be one case of the proposed method in this paper. The proposed method is statistical and multiphase level set (SMLS) method.

In the proposed method, first, a maximum likelihood objective function was defined for each point in a transformed domain, where the distribution overlaps between different matters can be reduced to some range [15]. Next, by integrating the maximum likelihood function over the complete image region, an energy functional is defined [16]. Then, this energy functional is merged into a multiphase level set formulation. The level set formulation is exploited to obtain both bias correction and matter segmentation. The remarkable benefit of this method is that the smoothness of the resulting bias field is attained by normalized convolution without extra cost .

2. Modelling of Intensity Inhomogenity

The Images with intensity inhomogeneity is represented using the following notation.

Detecting Disease via Quadcopter for Paddy Crop Using Image Processing

G.Mallikharjuna Rao[1]
[1]*CBIT, Osmania University, Hyderabad*
(E-mail: mallikharjunag@gmail.com)

Abstract— Dynamic remotely operated navigation equipment is used for automation without human intervention, in different spheres of agriculture. In this project, we signify the design part of the Quadcopter with a camera to capture the images of paddy crop. The captured images are processed to find the paddy crop diseases and send the alerts to the owner, without human intervention in the fields. The quadcopter is used to capture the image from the location and to store it for further processing. The algorithm is to compare the stored images with the database image using a color pattern matching algorithm to identify the disease and to send the alerts. The LabVIEW vision assistant is used to detect the problems in the paddy crop. Further, the algorithm is used to find the number of grains, to state the crop growth assurance using the above-said approach.

Keywords— *Quadcopter, LabVIEW Vision Assistant, color pattern matching, Paddy crop, Image Processing*

I. INTRODUCTION

In India, the paddy crop plays a crucial role in the economy, the farmer is facing many problems due to lack of availability of labor, increasing labor costs, improper guidance, crop damage, the climatic conditions and to assess the crop health. As the technologies emerging, drones [1] offer the potential for several significant challenges. In predictable weed control, the field is typically treated uniformly with a single herbicide dose by spraying the chemicals on the crops and the weed in the same way. The former does require much knowledge about the spatial distribution know about the type of plants is needed in common conventional farming [2].

The approach of agricultural system management and smart farming typically requires detailed knowledge about the current status of the fields. The favorite way of monitoring the farmland is using aerial vehicles such as UAVs. Compared to ground vehicles [3], UAVs can cover large areas within a short time, and do not impact the fields through soil compaction as ground vehicles. For on-field intervention, we need to know the type of field and the spatial distribution of the weeds at the earliest [4]. To overcome these issues against the crop for the farmer, quadcopter [5] used as an assistive device, this has high demand in the surveillance and industrial sector [6].

A helicopter is a flying machine which uses fast spinning rotors to push air downwards, to create a thrust force keeping the aircraft aloft. A quadrotor helicopter (Quadcopter) is a helicopter, in which the mechanism is same as a helicopter. The quadcopter control obtained by adding two more rotors to allow more degrees of freedom, which has four rotors. It is extremely difficult and impossible to manage the rotors without electronic assistance. Three translations and three rotational in a total of six degrees of freedom and only four inputs rotors of quadcopter are severely under activated. In which we have six degrees of freedom rotational and translational motion is coupled, the dynamics of a nonlinear accounting of complicated aerodynamic system, unlike ground vehicles, helicopters, the quadcopter with very little friction to prevent their motion. It must provide its damping for stability and to stop moving.

Two significant movements considered in the quadcopter, thrust, and torque. Quadcopter consists of four propellers attached to the motors which create the push and help the quadcopter to elevate height. The motion of quadcopter based on the values given to it [7]. Two motors rotate in a clockwise direction while other two will turn anticlockwise direction, the four moments of a control motion of a quadcopter stands classified as Throttle, Yaw rotation (ψ), Pitch rotation (Θ) and Roll rotation (ϕ) shown in figure 1.

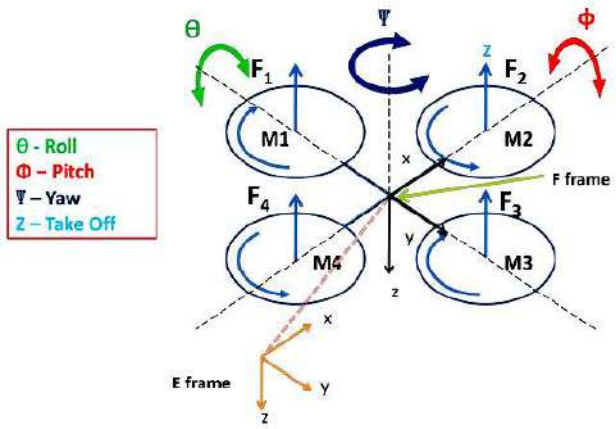

Figure 1: Roll, Pitch, and Yaw movement

Throttle, the moment of the quadcopter is a top or bottom of the controlled throttle stick of transmitter. Yaw rotation, the movement of the quadcopter to move is a left or right. Pitch rotation, the whole evolution of the quadcopter is in the forward direction or the backward direction. Roll rotation, the movement of the longitudinal axis of a quadcopter as it rolls left or right motion of the throttle shown in figure 2.

Another significant part is to focus on the camera path using image processing plays a vital role in the UAV based smart agriculture system. The complete method depends on identification of the color location using the variations in the

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Research Article

ANALYSIS OF MODIFIED REED SOLOMON ERROR CORRECTING CODES

Mounika Jammula*

Department of ECE, CBIT, Gandipet, Hyderabad

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ABSTRACT

In a Satellite or Tele Communication channel there is a high probability of corruption of data. So it is very much important to establish a reliable channel for communication. In order to overcome this problem, many error correcting techniques were introduced over time. Among all Reed-Solomon is the most popular technique. Reed – Solomon codes are an important sub – class of non-binary BCH codes. These are cyclic codes and are very effectively used for the detection and correction of burst errors. Galois field arithmetic is used for encoding and decoding of Reed – Solomon codes. Galois field multipliers are used for encoding the information block. At the decoder, the syndrome of the received codeword is calculated using the generator polynomial to detect errors. Then to correct these errors, an error locator polynomial is calculated. From the error locator polynomial, the location of the error and its magnitude is obtained. Consequently a correct codeword is obtained. RS Codes are implemented using VHDL and the functional working of the modified architecture has been tested using modelsim.

INTRODUCTION

All the advancements in the field of communication are to be achieved through reliability and efficiency. In most cases reliability is given the priority over efficiency though at certain cases one is compromised for the other. Reliability of communication has an impact even in our day to day life. For example message received on our mobile phone may become unreadable if some error occurs during the transmission, or a scratch in our DVD may make it unreadable. There are wide ranges of concern in the field of digital communication [1].

Generally communication is understood as transmission and reception of data from one place to other at some distance. If we change the reference it can also include transmission and reception of data at the same place but at a different point of time, which means storage and retrieval of data. Hence storage is also a part of communication. In any system application we come across errors either in communication or in storage. Errors in transmission are mainly because of noise, electromagnetic interferences, cross talk, bandwidth limitation, etc. In case of storage, errors may occur because of increase in magnetic flux as in case of magnetic disc or it can be spurious change of bits because of electromagnetic interferences as in case of DRAM. Hence dealing with these errors when they occur is the matter of concern.

The first step is to detect the error. And after the error gets detected there are two alternate approaches to proceed [2]. Forward error correction (FEC) approach, error is both detected and corrected at the receiver end. To enable the receiver to detect and correct the data, some redundant information is sent with the actual information by the transmitter. After being introduced to both the approaches, one should choose whether which approach is to be used. Automatic repeat request is easier but if the error occurs much frequently, then retransmission at that frequency will particularly reduce the effective rate of data transmission. However, in some cases retransmission may not be feasible to us. In those cases, Forward Error correction would be more suitable. As Forward Error Correction involves additional information during transmission along with the actual data. It also reduces the effective data rate which is independent of rate of error. Hence, if error occurs less frequently then Automatic request approach is followed keeping in mind that retransmission is feasible.

Out of the various FEC's, Reed Solomon code is one. These are block error correcting codes with wide range of applications in the field of digital communications. These codes are used to correct errors in devices such as CD's, DVDs etc.., wireless communications, many digital subscriber lines such as ADSL, HDSL etc… They describe a systematic way of building codes that can detect and correct multiple errors. In a

Corresponding author:* **Mounika Jammula
Department of ECE, CBIT, Gandipet, Hyderabad

Development and Testing of ARINC429 IP using FPGA for Navigation System

[1]Sri J.Balakrishna, [2]K. Suryateja, [3]Dr. N. Alivelu Manga

[1]*Assistant Professor, Department of ECE, Chaitanya Bharathi Institute of Technology (A), Hyderabad.*

[2]*ME-ESVD, Department of ECE, Chaitanya Bharathi Institute of Technology (A), Hyderabad, India.*

[3]*Associate Professor, Department of ECE, Chaitanya Bharathi Institute of Technology (A), Hyderabad.*

***Abstract*—** ARINC 429 is an Aeronautical Radio INCorporated (ARINC) protocol used data bus for Defence Aircraft, commercial, helicopters, and Military Aircraft. It defines the process of communication among various modules of avionics. This paper presents the design and development of required individual blocks (Serial In Parallel Out, Parallel In Serial Out, FIFO Tx, FIFO Rx, and memory) of ARINC429IP using Verilog HDL further integrate all the blocks as a single module and verify the results by programming the module in the RCI developed Navigation board using ChiproScope Pro and CRO.

***Keywords*—** *ARINC429, DDC*

I. INTRODUCTION

The ARINC specification defines the electrical and data characteristics and protocols, Data words are 32 bits in length and most messages consists of a single data word. Messages are transmitted at either 12.5 or 100 Kbit/s to other system elements that are monitoring the bus messages. ARINC 429 has been installed on most commercial transport aircraft including; Airbus A310/A320 and A330/A340; Bell Helicopters; Boeing 727, 737, 747, 757, and 767; and McDonnell Douglas MD-11.

Data can be transmitted in one direction only – simplex communication – with bi-directional transmission requiring two channels or buses.

II. BLOCK DIAGRAM

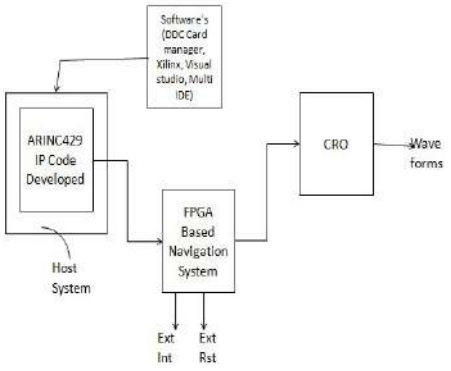

Fig. 1.1: Generalized Block Diagram

First Required software is to get installed in the host system, and the code is developed using the corresponding EDA tool and after developing the code, the code is dumped in to the navigation system which it contains external interrupt pin and external reset pin and after that CRO is connected with CRO probes and place that probes on the test points of the board to get the results.

III. DATA FORMAT

ARINC data words are 32 bits. This includes five primary fields, namely Parity, SSM, Data, SDI, and Label. ARINC convention numbers the bits from 1 (LSB) to 32 (MSB). The following table is showing the word format.

TABLE I. ARINC WORD FORMAT

32	31 30	29 11	10 9	8 1
P	SSM	MSB DATA LSB	SDI	LABEL

Parity (P)

The MSB is always the parity bit for ARINC 429. Odd parity means that there must be an odd number of "1" bits in the 32-bit word. For even parity 1-31 contain an even number of '1' bits.

Sign Status Matrix (SSM)

Bits 31 and 30 contain the Sign/Status Matrix or SSM. This field contains hardware equipment condition, operational mode, or validity of data content.

TABLE II. SSM CODE FOR BCD DATA

Bit		Meaning
0	0	Plus, North, East, Right, To, Above
0	1	No Computed Data
1	0	Functional Test
1	1	Minus, South, West, Left, From

Data

Bits 29 through 11 contain the data, which may be in a number of different formats.

Source Destination Identifier (SDI)

Bits 10 and 9 provide a Source/Destination Identifier or SDI. This is used for multiple receivers to identify the receiver for which the data is destined.

Design and Synthesis of Combinational Circuits using Reversible Logic Gates

Ms. P. Swathi
M.E, Dept of ECE
Chaitanya Bharathi Institute of Technology (A)
Hyderabad, India

Sri. J. Balakrishna
Assistant professor,
Dept. of ECE
Chaitanya Bharathi Institute of Technology (A)
Hyderabad,India

Dr. N. Alivelu Manga
Associate professor,
Dept. of ECE
Chaitanya Bharathi Institute of Technology (A)
Hyderabad,India

***Abstract*—**Reversible logic gates has ability to reduce the power dissipation which is the main requirement in low power VLSI design. A circuit is said to be reversible, if number of inputs are equal to number of outputs and there is one to one mapping between the input and output vectors. Using outputs we can obtain full knowledge of inputs. This paper realizes the combinational circuits like comparator, full adder using reversible decoder. Reversible decoder is designed using reversible logic gates like Fredkin gate, Peres gate, TR gate and Feynman gate with minimum quantum cost.

Keywords-*Quantum Cost, Reversible Gates, Garbage Output.*

I. INTRODUCTION

Reversible logic is referred as a logic in which number of inputs and number of outputs are equal. In order to maintain reversibility, Garbage outputs are needed. Quantum cost, Garbage outputs, Number of gates are used to estimate performance of reversible circuits. Number of gates are the gates required to design the circuit.

i.Garbage outputs: Garbage outputs are extra outputs which maintain the reversibility. Every gate output is not used as input to other gates.

ii.Quantum Cost: The quantum cost of a reversible gate is the number of 1*1 and 2*2 reversible gates are used to design a circuit.

II. REVERSIBLE LOGIC GATES

The basic Reversible Logic Gates present in the literature are briefed below. The gates that are suitable for the design with optimum quantum cost can be selected.

i.NOT GATE: The NOT GATE is 1×1 Reversible Logic Gate with the quantum cost zero. The Not gate simply shifts the complementary of the input to output as shown in the Fig. 1. It is primitive gate to find quantum cost.

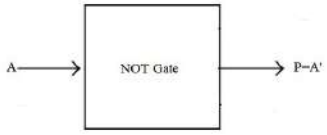

Fig. 1 NOT Gate

ii. FEYNMAN GATE (FG): Feynman gate is a 2×2 reversible gate as shown in Fig. 2. The Feynman gate is also called as CNOT gate i.e., controlled NOT gate. The Feynman gate is used to duplicate outputs. The Quantum Cost of FG is 1. This is also the primitive gate owing its importance in determining quantum cost metric.

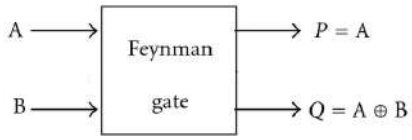

Fig. 2 Feynman Gate

iii.DOUBLE FEYNMAN GATE (DFG): Double Feynman Gate is a 3×3 reversible gate. The outputs are defined as shown in Fig. 3. The quantum cost of DFG is 2. This gate can also be used for duplicating outputs.

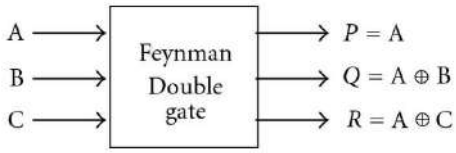

Fig. 3 Double Feynman Gate

iv.FREDKIN GATE (FDG): Fredkin Gate is a 3×3 reversible gate. The outputs are defined as shown in Fig. 4. The Quantum Cost of FDG is 5. This paper mainly surrounds around Fredkin gate.

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PERFORMANCE ANALYSIS OF SPLINE BASED SEGMENTATION ALGORITHM FOR NATURAL IMAGE SEGMENTATION

DAVID SOLOMON RAJU Y
Research Scholar, Department of Electronics and Communication Engineering, Rayalaseema University, Kurnool

DR. D. KRISHNA REDDY
Department of Electronics and Communication Engineering
Professor, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana State, India

Abstract
Interactive image segmentation algorithms are becoming more popular due to its intuitiveness to retain effective results. This paper presents an effective approach of natural image segmentation with optimization of Green's function using spline regression. The proposed approach separates foreground and background pixel values based on an interactive labeling from the user. The approach is tested with multiple datasets and compared against several learning based algorithms and interactive based algorithms and observed that the approach yields better segmented results.

Keywords: Natural image segmentation, Spline regression, Green's Function

1. Introduction

Segmentation of image is considered as one of the main solution to computer vision problem. It plays a vital role in object detection, recognition and tracking applications. In all most every computer vision application involves the segmentation problem. Interactive segmentation on other hand has attained grater interest in these areas due to its accuracy in detecting the objects and also this process involves minimal labor and results are more accurate than learning based and automatic segmentations. There are two main requirements for this interactive image segmentation process (i) the algorithm should be able to produce segmentation results that reflect user's intent (ii) the algorithm should be so efficient in providing the instant feedback

Several interactive based segmentation algorithms were proposed so far in the literature in the past decade and many of them involve a regressive approach that makes it too complicated for the real time implementation. Some of them include active contour models like level set [1], Snakes [2], Watershed [3], Random walkers [4], Graph cuts [5]. In active contour methods, the segmentation results are obtained by placing a contour nearer to the boundary there by it could be able to grab out a certain boundary region. This method suffers from a major drawback is that the contour may be likely to be trapped in local minimum. On contrast, the intelligent scissor algorithm expects the user to place points along the desired contour. The proposal mentioned in the paper is belongs to one such type of algorithm where the foreground and background pixels are marked with different colour tone by the user in an interactive manner.

Many researchers have focused on this interactive based image segmentation such as grab cut method as proposed in [6] [7]. In this analysis both regional and boundary properties are considered. With these methods an image is modeled as a graph. The node of each branch represents a pixel where the adjacent two neighboring nodes are connected with a weighted edge defined as the distance between the pixel

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PERFORMANCE ANALYSIS OF SPLINE BASED SEGMENTATION ALGORITHM FOR NATURAL IMAGE SEGMENTATION

DAVID SOLOMON RAJU Y
Research Scholar, Department of Electronics and Communication Engineering, Rayalaseema University, Kurnool

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Development of a Novel Block Matching Algorithm to Improve Motion Estimation Using Summed Area Table

B.PRABHAKAR, D.KRISHNAREDDY* and A.V. PARAMKUSAM**
Dept. of ECE, JNTUHCEJ Jagtial, Telangana,Inida
Dept. of ECE CBIT,Hyderabad,Telangana, India*
Dept. of ECE MLRIT, Dundigal,Telangana, India**
bprabhakar@jntuh.ac.in, dkreddy@cbit.ac.in* adapa74@gmail.com**

ABSTRACT

A novel and computationally efficient block matching motion estimation algorithm that uses a summed-area table for motion vector determination is presented. In contrast to the Multi layer Motion Estimation (MME) algorithm, the proposed algorithm uses a summed-area table instead of an overlapped hierarchical quad-tree structure to represent the search area. When a Summed-Area Table (SAT) is used, partial block sums are evaluated as the occasion demands. As a result, the speed with motion estimation by using a summed-area table is increased when compared to the MME algorithm. Moreover, the proposed scheme needs less memory than the MME approach to maintain block sums of candidates.

Key words: MME, MSEA and SAT

I.Introduction

The key objective in developing a Block Matching Algorithm (BMA) is to reduce the computational complexity of motion estimation as much as possible while maintaining the motion prediction quality very close to the full-search algorithm. With this objective as a main aim, several block matching algorithms have been proposed so far and still designing the most efficient BMA remains an open research challenge. These block matching algorithms can broadly be grouped into two categories. One is a class of fast search motion estimation algorithm [1-10] which reduce the computational complexity of motion estimation by reducing the number of search points to be checked as many as possible by avoiding unnecessary searching steps. Since these algorithms do not check all the search points, the obtained motion vectors may not be optimum motion vectors. However, the trade-off between motion prediction quality and computational complexity is typically good. Some popular fast search motion estimation algorithms for example Directional Asymmetric Search with prediction scheme (DASp) [6] and Enhanced Hexagonal-Based Search Using Direction-Oriented Search (EHS-DOIS) [7] reduce the computational cost of motion estimation as much as possible.

The second group is a class of fast full search motion estimation algorithms [11-15] which use some reasonable matching criteria (partial distortions) to decrease the amount of the calculation of the block distortion measure at each search point. Some famous algorithms in this category are Multilevel Successive Elimination Algorithm (MSEA) [13], Fine Granularity Successive Elimination(FGSE) algorithm [14], Adaptive MSEA (AdaMSEA) [15]. These algorithms construct a hierarchical quad-tree structure at each search point of the reference frame to calculate partial distortion measures.

The Multi-Layer Motion Estimation (MME) [16] algorithm is one of typical hierarchical motion estimation algorithms which employs partial

Radio Frequency Identification and Detection (RFID) based e-passport verification scheme using Contactless IC Technology

N. Jagan Mohan Reddy[1]
[1]CBIT,Osmania University,Hyderabad.
(E-mail: jaganmohan118@gmail.com)

***Abstract*—** Recent advances in technology have created better situations and greater assertion of authorized travel documents to be owned by people at large. Current scenario focuses on people possessing Electronic passports that are gaining wide popularity over time in many developed and developing countries for several security reasons. This helps in making the potential of identification of individuals to be carried on a much easier and a pragmatic level. This paper describes a novel design based on RFID security system principle to address the loop-holes of present day passport verification techniques and provides an alternative and foolproof method to identify individuals at a much more accurate level. The system combines RFID communication technology with an Embedded Systems approach through the use of a microcontroller. The RFID tag is installed in the passport and is detected by means of ZigBee transceiver. Any malpractice or counterfeit is examined and the criminal is immediately caught. Furthermore, by making use of a contactless IC technology it simplifies the task of passport verification by eliminating the cumbersome process of verifying smart cards.

Keywords—Security, Contactless IC technology, RFID tags, E-passports, embedded systems, smart travel documents, visa-embedded passport.

I. INTRODUCTION

In the present day society, security is becoming an increasing concern at an alarming rate in the lives of many travelers and governments of various countries on an international scale. Most of the countries in the globe are involving passport verification as a mandate in order to improve the security levels for travelling abroad. Radio Frequency Identification (RFID) technique has become very handy now-a-days in order to identify and verify passports, visas and other immigration related papers though still it is not into the market so effectively. Travel abroad permission grants that are to be issued in the coming days can be made with the help of contactless IC technology On top of that it also accounts for a large memory and storage space when compared to its primitive. The processing speed and computational power are also fairly on the higher side. Hence, this paves the path to provide visas in a completely different and secure manner. On top of this, since the contactless design does not depend on any line of sight or particular orientation for inspection, future visas can be used as RFID tags themselves and can be attached to the existing blank pages of the passport.

This paper deals with an Embedded Systems approach and task that includes a microcontroller for performing the desired application. The particulars of the particular individual are stored in the RFID tag and the RFID reader finds out the information and specific radio waves thereby interpreting significant and consequential information from the frequencies associated. The data is then wirelessly transmitted from the RFID card to the ZigBee transceiver which in turn sends the received information to the microcontroller. The microcontroller simply compares the data received with that present in the EEPROM memory. If the data is completely coherent, them the person is allowed else the person is referred as unauthenticated through the help of a buzzer or alarm signal. The details of the decision are displayed in an LCD.

II. LITERATURE SURVEY

At present, technology is imbibed with the ability to accomplish various tasks of multiple complexities in almost all walks of life. The way to justify this boom or advancement in technology is to implement it for fulfilling various requirements of human life. Hence it always takes the frontier position in improving the quality of human life. One method by which it is done is to unite and automat several individual tasks by using complex logic.

The book [1] provides an exhaustive idea about various features of the conventional 8051 microcontroller from which the other logics and concepts were produced for the purpose of implementing them in this work.

Complete credit goes to innovative RFID technology that has paved the way to creative prospects and breakthroughs for the identification as well as verification of passports and visas, although its utility still remains in question due to several practical and legal reasons. With the electronics passports, several advantages can be drawn as mentioned earlier. Therefore, this provides a great impetus to the concerned authorities to look for a while on this matter and utilize the value of information it offers. Although contactless IC based technology is being supported over here still there are many challenges that are involved in replacing the contact based

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Delay, Power performance of 8-Bit ALU Using Carry Look-Ahead Adder with High V_t Cell

Bhukya Shankar[1], E Chandra Sekhar [2]
[1]*Assistant Professor, CVR College of Engg, ECE Dept, Hydearbad, India*
[2]*Asst. Prof., CBIT, ECE Dept, Hyderabad, India*

Abstract: ***A Low power 8-bit Arithmetic Logic unit (ALU) using a Carry look-ahead adder (CLA) and placing High V_t (HV_t) cells in Critical path is anticipated. The ALU is designed in 45nm CMOS technology. ALU is a most essential circuit in any processor. It consists of AE, LE, CLA and CE. This ALU is designed to calculate Arithmetic and Logical operations. Power and Delay values of different 8-bit adders like CLA, Sparse and Ripple- carry adder (RCA) are designed and compared. The simulation results show that the design of ALU using CLA and implementing High V_t and Standard V_t cells in the CLA gives more power and delay efficient than with only Standard threshold voltage cells.***
Index Terms: Arithmetic Extender, Logic Extender, Carry Extender, Carry Look-ahead Adder

I. INTRODUCTION

ALU is the major power hungry block in any microprocessor and micro controller. It performs both arithmetic and logical operations. Conventional ALU consists of Arithmetic Extender, Logical Extender, Carry Extender and Ripple carry adder. An Adder is an integral part of the ALU and it is a power density block in ALU. Hence, to improve the performance of ALU in terms of Power, delay High V_t Concept is introduced. Before knowing about High V_t cells one should know about types of transistors.

A. Low Vth transistor (LV_t)

The low $V_t$transistor type is used for applications where the speed is of primary importance. The disadvantage of this type of transistors is that, due to low threshold Voltage (V_t), the static power is very high.

B. Standard Vth Transistors (SV_t)

The standard V_{th} transistor type is used when delay and static power has been traded off.

C. High Vth Transistor (HV_t)

The High Vth transistor is a favor for extremely low static power consumption. So for educing power and delay High V_t cells are used in entire ALU and in critical path Standard Vth transistors are used. The reference [5] and [6] explains about the design of a full adder using PTL and Gate diffusion technique in ALU. Here we have designed an eight bit ALU with three select lines for performing eight operations. In these eight operations, four operations are executed for logical and four operations are executed for arithmetic operations. The design includes four basic blocks: They are CLA, Logic Extender (LE), Arithmetic Extender (AE), and Carry Extender (CE). The function of LE is to operate logic operations, AE is to operate arithmetic operations, CE is for carry operations and CLA is for actual arithmetic operations.

II. CONVENTIONAL ALU

The Arithmetic logic unit (ALU) is the furthermost significant block in microprocessor [1]. This one is used on behalf of executing arithmetic and logic operations alike addition, Subtraction, Logical OR and Logical AND. In the Conventional ALU Ripple carry adder (RCA) is used, and the delay and power values are more. So, instead of the RCA, we have selected Carry look-ahead adder. Since, ALU requires high speed and Low power. The overall circuit for 4-bit ALU is shown in figure1 [2]. There are two different Combinational circuits in front of CLA are LE and AE.

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NATURE INSPIRED OPTIMIZATION ALGORITHMS IN ARTIFICIAL NEURAL NETWORK FOR SPEAKER RECOGNITION

N. Dhana Lakshmi
ECE Department, Chaitanya Bharathi Institute of Technology, Hyderabad, India

ABSTRACT

Speaker recognition system has gained significant research interest, owing to security enforcement in many applications. Typically, the speaker recognition system is employed for authentication means identifying the person using their voices. Hence, a speaker recognition system must be capable of achieving greater recognition accuracy rates irrespective of text that speaker spokes. This work is concerned with ANNs that have turned out to be an intense pattern recognition tools effectively utilized for some real world applications in the course of the last few years. The novelty of these techniques relies on restructuring the conventional structure of ANN (layer and neurons) optimally. This work incorporates couple of evolutionary techniques and swarm intelligence techniques namely EA, GA and PSO. The results intent that the restructure network reveals optimal performance (classification accuracy) over conventional ANN structure.

Keywords: ANN, Evolutionary Algorithm, Genetic Algorithm, Particle Swarm Optimization, Nature Inspired Optimization Algorithms

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http://iaeme.com/Home/issue/IJEET?Volume=9&Issue=3

1. INTRODUCTION

Speaker recognition is an explored region for the scientists of speech processing. Speaker recognition is undertaking of distinguishing individual from properties of speech samples [1]. Speaker recognition is a vital apparatus for innumerable applications namely access control and client security protection [2]. The speech signal carries essential data namely message content, language, speaker identity, speaker emotion, speaker personality, and so on [3]. Recent advances in voice examination have empowered the visualization of vocal fold dynamics related with particular voice disorders [4]. Implement a Speaker Recognition System (SRS) utilizing Linear Prediction Coding (LPC) and Mel-Frequency Cepstrum Coefficients (MFCC) as feature extraction methods [5]. The model parameters are regularly

138.A Novel Approach to Predict High Blood Pressure Using ABF Function

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A Novel Approach to Predict High Blood Pressure Using ABF Function

Satyanarayana Nimmala
Department of Computer Science and Engineering, CVR Institute of Technology, Hyderabad, India
Email: satyasace234@gmail.com

Ramadevi Y.
Department of Computer Science and Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad, India
Email: yrdese.cbit@gmail.com

Ramalingaswamy Cheruku
Mahindra Ecole Centrale College of Engineering, Bahadurpally, Hyderabad, India
Email: ramalingaswamy.cheruku@mechyd.ac.in

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Abstract—High Blood Pressure (HBP) is a state in the biological system of human beings developed due to physical and psychological changes. Nowadays, it is a most prevalent problem in human beings irrespective of age, place, and profession. The HBP victims are increasing rapidly across the globe. HBP is undiagnosed in the majority of the patients because most of the affected people are not aware of it. To overcome this problem, this paper proposes a new approach that uses ABF (Arterial Blood Flow)-function to predict a person is prone to HBP. In this approach, the impact factor for each attribute is calculated based on the attribute value. Both attribute value and corresponding impact factor are used by ABF function to predict a person is prone to HBP. We experimented proposed approach on real-time data set, which consists of 1100 patient records in the age group between 18 and 65. Our approach outperforms regarding predictive accuracy over j48, Naive Bayes and Rule-based classifiers.

Index Terms—High blood pressure, age, cholesterol, obesity, classification, data mining.

I. Introduction

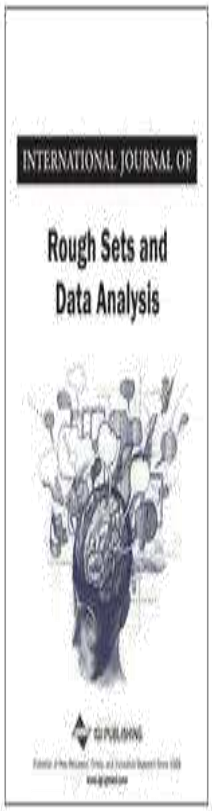
Blood Pressure may vary with the change in age, obesity, cholesterol levels [1]. So, this paper considers these three parameters for experimental analysis. The first concern is age, the impact of age may be one of the reasons for high Blood Pressure (BP), especially people of age between 40 and above. As the person is aging, 1) the performance of the cardiovascular system may decrease, 2) Arteries become thinner and harden, 3) the capacity of the body to process sodium in the diet decreases. The second concern is obesity, which is represented using BMI (Body Mass Index) [1]. If BMI value is in between 20 and 25, then the person is not obese. If its value is in between 25 and 29.9 then the person considered as overweight. If its value is more than 30 then the person is considered as obese. Obese means more blood has to be pumped to provide nutrients and oxygen to body tissues newly formed because of overweight. A third concern is blood cholesterol if total blood cholesterol level is high, and then the excess oily fat will stick to the walls of the arteries [2]. If the same state is continued for a longer period, it can create a fatty buildup against the walls of arteries. The fatty substance finally hardens, forming a type of hardened plaque that damages the arteries or they become firm and narrowed [20].

This paper proposes a novel approach that works in two steps. In the first step, for each attribute impact factors are set. The impact factor is a real value which represents the degree of influence of an attribute in elevating blood pressure. Impact factor for each attribute of the selected record is set based on the attribute value and its relationship with class labeled attribute using Pearson correlation coefficient. PCC is calculated using the equation 1.

$$PCC = \frac{N\sum XY - \sum X \sum Y}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}} \quad (1)$$

In the second step, the proposed algorithm calculates the value of class label attribute using impact factor and corresponding attribute value. The class label attribute value is then used to predict whether a person is prone to HBP. Our proposed approach calculates and tabulates impact factors in the training phase of the classifier based on the input data set.

139.Detecting Communities in Dynamic Social Networks using Modularity Ensembles SOM



Detecting Communities in Dynamic Social Networks using Modularity Ensembles SOM

Raju Enugala (SR Engineering College, Department of Computer Science and Engineering, Warangal, India), Lakshmi Rajamani (Osmania University, Hyderabad, India), Sravanthi Kurapati (Kakatiya University, Warangal, India), Mohammad Ali Kadampur (Saudi Electronic University, Department of Computer Science & Information Technology, Riyadh, Saudi Arabia) and Y. Rama Devi (Chaitanya Bharathi Institute of Technology, Hyderabad, India)

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Abstract

Social network analysis has gained much importance these days. Social network analysis is the process of recording various patterns of interactions between a set of social entities. An important phenomenon that draws the attention of analysis is the emergence of communities in these networks. The understanding and detection of communities in these networks is a challenging research problem. However, approaches to detect communities have largely focused on identifying communities in static social networks. But real-world social networks are not always static. In fact, many social networks in reality (such as Facebook, Bebo and Twitter) are dynamic networks that frequently change over time. In this paper, a framework is proposed for community detection in dynamic social networks, which explores self-organizing maps (SOM) for cluster selection and modularity measure for community strength identification. Experimental results on synthetic network datasets show the effectiveness of the proposed approach.

140.An Innovative Data driven Computational Model To Predict High Blood Pressure based on AAA++

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

Satyanarayana Nimmala[a,*], Y. Ramadevi[b], B. Ashwin Kumar[a], R. Sahith[a]

[a] Department of CSE, CVR College of Engineering, Vastunagar, Mangalpalli (V), Ibrahimpatnam (M), Rangareddy (D), Telangana, 501510, India
[b] Department of CSE, Chaitanya Bharathi Institute of Technology, Kokapet (V), Gandipet (M), Hyderabad (D), Telangana, 500075, India

ARTICLE INFO

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Hypertension
Obesity
Anxiolation
Cholesterol
Anxiety

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, Ozark 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 non-technical 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], 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.[2] 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.[2] 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,

* Corresponding author.
E-mail address: satyasn234@gmail.com (S. Nimmala).

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141.High blood pressure prediction based on AAA++ using machine learning algorithms

COMPUTER SCIENCE | RESEARCH ARTICLE

High blood pressure prediction based on AAA++ using machine-learning algorithms

Satyanarayana Nimmala[1]*, Y. Ramadevi[2], R. Sahith[3] and Ramalingaswamy Cheruku[4]

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*Corresponding author:
Satyanarayana Nimmala,
Department of CSE, CVRCE,
Hyderabad, India
E-mail: satyauce234@gmail.com

Reviewing editor:
Humaira Nisar, Universiti Tunku Abdul Rahman, Malaysia

Additional information is available at the end of the article

Abstract: The heart pumps the blood around the body to supply energy and oxygen for all the tissues of the body. In order to pump the blood, heart pushes the blood against the walls of arteries, which creates some pressure inside the arteries, called as blood pressure (BP). If this pressure is more than the desired level, we treat it as high blood pressure (HBP). Present days, HBP victims are growing in number across the globe. BP may be elevated because of change in biological or psychological state of a person. In this paper, we considered attributes such as age, anger, and anxiety (AAA) and obesity (+), cholesterol level (+) of a person to predict whether a person is prone to HBP or not. Obesity and cholesterol levels are considered as post-increment of AAA, where obesity as one +, and total blood cholesterol as another + because experimental results reveal that their impact is less comparatively AAA. In our technique, we used different classifiers for prediction, where each classifier considers the impact of each A in AAA along with obesity and cholesterol level of a person to predict whether a person becomes a victim of HBP or not. Random forest algorithm has shown 87.5% accuracy in prediction.

Subjects: Health & Society; Health Conditions; Public Health Policy and Practice

Keywords: blood pressure; stress; age; anxiety; anger; obesity; blood cholesterol; hypertension

1. Introduction

Blood pressure (BP) is represented as systolic blood pressure (SBP) over diastolic blood pressure (DBP). If SBP exceeds 140 mm Hg or DBP exceeds 90 mm Hg on repeated measurements then it is treated as high blood pressure (HBP) (Alwan, 2011). Nowadays, HBP is one of the prime causes of

ABOUT THE AUTHOR

Mr. Satyanarayana Nimmala presently is pursuing his Ph.D. from Osmania University, Hyderabad, India. He did his B.Tech from Kakatiya University, Kothagudem, India. He pursued his M.Tech from JNTUH, Hyderabad, India. Presently, he is working as an associate professor in the Department of CSE, CVR College of Engineering, Hyderabad, India. His research interests are data mining, bioinformatics, and machine learning.

PUBLIC INTEREST STATEMENT

Before diagnosis and treatment of most of the diseases, doctors measure the blood pressure of a person. High blood pressure of person is a key factor for many diseases like heart stroke, brain stroke, kidney failure, eye damage, and many others. In our research work, we focused on why the blood pressure of a person is elevated, by considering factors such as age, obesity level, cholesterol level, anger level, and anxiety level of a person. We examined 1000 patients' data and we used the above-listed parameters to predict whether a person becomes a victim of High blood pressure or not. Results reveal that anger level, anxiety level, and obesity level are playing a vital role in elevating the blood pressure of a person.

142. Implementation of Home Automation System using MQTT protocol and ESP32

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Implementation of Home Automation System using MQTT Protocol and ESP32

V. Thirupathi, K. Sagar

ABSTRACT*— *In the era of Internet of Things (IOT) and digital technology automation of everything has become more popular. People are very smart, they want to control and monitor everything from working places. This paper explains a cloud based home automation system using MQTT protocol. It enable users to control and monitor home appliances using a mobile app or a web page. Using cloud technologies became cost effective because most cloud developers are offering their services freely.

Keywords: *IOT, Cloud, Mobile App, MQTT, ESP32*

I. INTRODUCTION

As technology developing faster, researchers are taking it as an advantage to implement new intelligent systems or enhancing the existing systems. Home automation system or smart home systems are getting more popularity in recent days. These home automation systems are enhancing by changing existing features like communication medium or features day to day.

Home automation systems enable users to control and monitor every home appliance from remote places. Many wireless technologies have introduced and enhanced in implementation of home automation systems in recent days. The available wireless technologies infrared, Bluetooth, ZigBee, Wi-Fi, RFID and GSM are used to develop a commercially viable smart home systems.

This paper explains design and development of a cloud based home automation system. Now a days many cloud vendors offering their services free of cost. So this system is cost effective, secure and reliable. MQTT protocol has in built security features so it provides security at Secure Socket Layer (SSL) level. A user can send relevant commands through cloud to control home appliances from remote places. This system is a combination of Wi-Fi, cloudMQTT, ESP32, relays and power supply unit. The remaining paper planned as follows: part II presents discussion on Home automation systems which were developed previously. Part III explains system design and implementation. Part IV presents evaluation. Conclusion discussed in part V.

II. RELATED WORK

Different home automation systems have developed by various authors. In this sections I will give a brief discussion on home automation system based on communication mediums.

A. Bluetooth enabled Home Automation systems.

Bluetooth is a wireless equipment for transmitting data between two devices that are in nearby propinquity; it is most appropriate for little timed transmissions. Bluetooth communication equipment does not need line of sight between the two connecting devices. It is a feasible alternative to develop home automation systems over the traditional remote control.

In [1], the authors explained about „PICONET", which is used to create network in Bluetooth equipment. Authors explained master-slave communication among different devices. The Bluetooth device which is connected to microcontroller chip and serves as a master and other devices which are connected to different appliances are slaves. An Android mobile phone is used as a remote controller which sends appropriate commands through the Bluetooth device. These commands are collected by the microcontroller and necessary action would be taken. The microcontroller checks for new commands for every 500 milliseconds form android mobile phone. But it works with in short range of distance. In [2] and [27] authors explained a secure, low cost and flexible home automation system. Here Arduino microcontroller was used to receive commands from mobile phones. This system enables only the authorized users. Authentication has checked with passwords, if the password are correct then only the users are allowed to access the system. The ON/OFF signals sent through internet. [3] Explained home automation system using Bluetooth as communication medium. Android mobile phone was used as the remote controller, which has a user interface with ON/OFF buttons. When we press ON/OFF buttons appropriate command will be sent to the microcontroller through Bluetooth module. Microcontroller would take the decision i.e. which relay need to be enabled. Bluetooth has a major problem, which is not appropriate when user would like control appliance from a longer distances.

B. Home automation using ZigBee

Few authors implemented Home automation systems with ZigBee as a communication medium. It is an IEEE 802.15.4 [4] radio frequency (RF) based communication device. In [4] authors explained a home automation system with interoperability of home applications. Wi-Fi and ZigBee technologies have combined to create an integrated gateway which helps in controlling and monitoring home appliances remotely. These gateways are used to facilitate interoperability among networks.

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V. Thirupathi, (Research Scholar in OU), Assistant Professor S R Engineering College, Warangal, Telangana, India.

Dr. K. Sagar, Professor Chaitanya Bharathi institute of technology, Hyderabad, Telangana, India

143. Identifcation of Rare Diseases: An Outlier Analysis Approach

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Identification of Rare Diseases:An Outlier Analysis Approach

Lakshmi Sreenivasa Reddy D
Department of Information Technology
Chaitanya Bharathi Institute of Technology
Hyderabad, India.

S Chinaranu
Department of Computer Science & Engineering
Chaitanya Bharathi Institute of Technology
Hyderabad, India.

Abstract

In health industry, identification of most common diseases is very easy from health diagnosis data. Many frequency based algorithms are available to identify most frequent diseases. But there is little number of algorithms available to apply for low frequent diseases. In this paper some of the existing algorithms are applied to identify rare diseases and then optimized these algorithms to identify rare diseases automatically from huge amount of diagnosis data. Cancer data is used for experiments. Cancer data is collected from UCI ML repository [1]. The objective of the proposed work is to model a scientific method to detect rare diseases from diagnosis data. In this paper three models have been trained on the said data and detected these diseases automatically using Gaussian distribution. The main models along with Gaussian used here are Outlier factor by infrequency (OFI), Attribute value frequency (AVF) and BAD. Using these models with Gaussian achieved good accuracy.

Keywords: Cancer data, ECG data, Outlier, Classifier, Accuracy

INTRODUCTION

Outlier analysis is one of the important concepts in most applications. Most existing algorithms concentrated on numerical or ordinal attributes. Health diagnosis data includes more categorical attributes can be generalized and converted into numerical values. This procedure is not always preferable. This paper presents a simple method for categorical data. AVF method is one of the simple and efficient methods to detect outliers in categorical data. It calculates frequency of each attribute value in each attribute and finds their probabilities. This method calculates attribute value frequency score for each record by taking the average of all attribute value frequencies which are included in respected records. Outliers are records with lowest AVF scores. The only parameter used in this method is "k", the no. of outliers. FPOF is another frequent based method which depends on frequent patterns adopted from Apriori algorithm [3]. This method calculates frequent patterns of attribute values at different levels on each record. It calculates FPOF score from these patterns and finds the least FPOF scored records based on FPOF scores. These least score records are called outliers. This method requires two parameters 'k' , the no. of required outliers and a threshold value to decide frequent patterns. Time complexity of FPOF is more in detecting outliers when compared with AVF method. The parameters used in FPOF are n, a threshold value which is useful to decide frequent patterns in each record. There are other methods available for categorical data based on Entropy score. Greedy [4] is another method to detect outliers from categorical data. The existing approaches used to detect outliers were.

EXISTING METHODS FOR NUMERICAL DATA

A. Statistical based methods

Statistical Methods describe mainly the distribution of the data and uses univariate. These methods adopt a parametric model [3, 4]. Statistical methods have many drawbacks as the number of variables increases its efficiency decreases [4]. These draw backs can be rectified by applying principal component analysis (PCA). Attribute relevance analysis is another technique to rectify this problem. These ideas are useful for more dimensions in any Dataset.

B. Distance-based methods

Distance based methods do not take any assumptions on the distribution of the data objects because of computing the distances between all records. Complexity of these methods is very high. Large datasets with more records do not prefer these methods. Knorr's et al. [5], explained that apart of dataset records belong to each outlier must be less than some threshold value and achieved some improvements in this regard.

C. Density based methods

Density base methods find frequencies of the data records and identify anomalies as those lying in areas with low frequency. Breunig et al. described a local outlier factor (LOF) to identify local outliers based on a record contains sufficient neighbor around it or not [6]. LOF decides any record as an outlier if its LOF is less than the user defined threshold. Papadimitriou et al. defined similar methods called Local Correlation Integral (LCI). LCI selects the minimum points (min pts) in LOF through statistical methods [7]. The density based methods can detect outliers those are left by techniques with single, global criterion methods.

144.Analysis Of Weather Attributes To Predict Crops For The Season Using Data Mining

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Special Issue

Analysis of Weather Attributes to Predict Crops for the Season Using Data Mining

Kunal Teeda[1] Nandini Vallabhaneni[2] Dr.T.Sridevi[3]

Abstract— **Till the seventies of the last century, Indian agriculture was in a poor condition. The agrarian economy was largely consumption-oriented and there were poor irrigation facilities and simple agricultural implements. Agricultural yield was very low and dependency on nature was very high. The food grains were not enough to feed the population. With a view to augment the yield, the Indian government had no option but to introduce Green Revolution. The Green Revolution was a movement towards excessive mechanisation of agriculture. The agriculturists were motivated and assisted to undertake the technology-based farming. Irrigation facilities were developed. However, the results of Green Revolution were not uniform all over the country. Neither has there has been uniform impact on all kinds of crops nor has there been uniform impact on all the regions and all categories of farmers. Even today the farmer falls prey to the risks unleashed by the nature. Success or failure of rain fed vegetation depends upon the sample and amounts of rainfall. But, other factors like temperature, photoperiod and grid additionally notably influence crop boom and yield. The analysis of climate performs a key role in planning better farming structures to enhance and stabilise yields, and to design appropriate crop breeding strategies. With the use of technology, it has also become possible to minimise the risks involved in agriculture to which the early farmers were awfully exposed. There are in particular two procedures to predict rainfall. Empirical technique and dynamical method. In our method we use the empirical technique that is based on evaluation of historical information of the rainfall and its dating to a spread of atmospheric variables over different components of the nation. The most broadly used empirical approaches used for weather prediction are regression, artificial neural network, fuzzy logic and institution approach of statistics dealing with. We use data mining techniques such as clustering and classification techniques for rainfall prediction.**

I. INTRODUCTION

Agriculture in India has a full-size history, nowadays, India is ranked 2nd worldwide in farm output. Agriculture and allied sectors like forestry and fisheries accounted for 16.6 percent of the GDP 2009, about 50 percent of the overall workforce. The monetary contribution of agriculture to India's GDP is regularly declining with the united states' large-primarily based economic boom. Agriculture is a form of an enterprise with a chance.The production of plants relies on different factors like on climatic, geographical, organic, political and financial elements. Accurate statistics about the character of an ancient yield of the crop is important modelling input, which is useful to farmers and authorities organisation for decision-making technique in establishing right policies associated with subsequent manufacturing. The advancies in computing and information storage have provided largely at the maximum of information. The project has been to extract expertise from this uncooked statistics, statistics mining that may bridge the understanding of the facts to the crop yield estimation. This task aimed to statistics mining strategies and follow them to the various variables consisting inside the database to set up if significant relationships may be discovered and the usage of fuzzy common sense to discover the circumstance of crops on a diverse situation of rainfalls. Bangladeshi student proposes Data mining techniques to predict annual yield of major crops and recommend planting different crops in different districts in Bangladesh[5]. They considered the effects of biotic(pH, soil salinity), environmental(weather), and area of production as factors towards crop production in Bangladesh. Taking these factors into consideration as datasets for various districts, they applied clustering techniques to divide regions; and then they apply suitable classification techniques to obtain crop yield predictions. In the research paper by David H White and S Mark Howden[9], they focus on the climates determinants of crop productivity.They considered how the climate envelopes different crops based on temperature, moisture and light influence the distribution of cropping and other land uses around the world. They also discuss how these and other climatic variables influence the growth and yield of crops. Adaption strategies are also discussed that helps a lot to assist the crop producers to cope with the rising global temperatures and carbon dioxide (CO2) levels, along with the often reduced rainfall, soil moisture and water availability.

II. RELATED WORKS

[1] In this paper, the author Dr. D. Ashok Kumar states that the purpose of the examination at it is to observe the best techniques to extract new understanding and information from present soil profile data contained within ISRIC-WISE soil statistics set. Numerous records mining techniques like Support Vector Machines, K nearest Neighbours, Bayesian Networks. Also various optimisation strategies like Ant colony optimisation, Particle Swarm Optimisation. [2] This review article written by Dr. Bharath Misra focuses mostly on various attributes to be taken in consideration while applying data mining techniques in the field of agriculture and also concludes that The multidisciplinary approach of integrating computer science with agriculture will help in forecasting/ managing agricultural crops effectively. [3] Sally Jo Cunningham emphasises on the usage of data mining techniques and its process model to derive innovative applications in the field of agriculture. He also visualises the applications of data mining, the goal might be to use a model predictively, to

145. Secure Data Access in cloud with Multi-User Encrypted SQL Operations

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Secure Data Access in Cloud with Multi-User Encrypted SQL Operations

P. Satyanarayana
Department of Mathematics & Computer Science, Osmania, University, Hyderabad, India.

M.V. Ramanamurthy
Professor & Head, Department of MkH, MGIT, Gandipet, Hyderabad-75, India.

S. China Ramu
Associate Professor, Department of Computer Science and Engineering, CBIT, Gandipet, Hyderabad-75, India

Mustafa Abdu Lrazzaq Radhi Almuxawi
Department of Mathematics & Computer Science, Osmania University, Hyderabad, India

Abstract

It is a rare requirement to provide security at SQL level of cloud environment. When we use cloud for our business transactions or software development an deployment operations, we need to take care in all aspects of operations performing in cloud. As the cloud using internet as its backbone, it is essential to provide security to the data request and data providing. This paper provide an architecture to encrypt and decrypt the SQL request and response from the centralized cloud database.

Keywords: RSA algorithm, Cloud computing, **Eucalyptus, Infrastructure as Service (IaaS), Cipher Text, Decrypting,** Diffie Hellman Algorithm

INTRODUCTION

Distributed computing is a progressive figuring strategy, by which processing assets are given powerfully through Internet and the information stockpiling and calculation are outsourced to somebody or some gathering in a 'cloud'. It extraordinarily pulls in consideration and enthusiasm from both the scholarly world and industry because of the benefit, yet it additionally has no less than three difficulties that should be taken care before going to our genuine to the best of our insight. Above all else, information privacy ought to be ensured.

There are three main related issues behind the data related problems: execution of SQL operators over encrypted data; enforcement of access control mechanisms through selective encryption strategies; design of architectures not penalizing the performance and scalability that are typical of cloud-based services[1][4]. Existing proposals offer partial and separate solutions to data confidentiality and isolation.

For example, architectures supporting SQL operations on encrypted data leave access control to the cloud provider or enforce it through an intermediate trusted server. Other proposed architectures solve the problem of access control without the intervention of the cloud provider, but they do not allow execution of SQL operations on encrypted data. We propose the first architecture, called Multi-User relational Encrypted DataBase (MuteDB) [2][6], that guarantees data confidentiality by executing SQL operations on encrypted data and by enforcing access control policies through selective encryption methods. By combining these two approaches MuteDB is the only solution ensuring confidentiality of data stored in the cloud even in the worst threat scenario where legitimate database users collude with cloud provider employees. This result is achieved through an innovative model that translates access control policies related to a plaintext database into selective encryption strategies that are applied to the corresponding encrypted database. Our solution works even in dynamic scenarios, in which users and access control policies change over time, without the need to renew and redistribute user credentials. The proposed architecture is specifically designed for cloud database scenarios where multiple users can access the cloud database through the Internet possibly from different geographical areas.

The performance and scalability of MuteDB are evaluated through a prototype that is subject to different query workloads based on standard (TPC-C) and recently proposed (YCSB) database benchmarks. We highlight that, as a further contribution, T his paper reports the first performance evaluation studies related to encrypted cloud database services in real distributed environments where the clients are geographically distributed over the Planet Lab platform. Experimental results shows that MuteDB does not affect the scalability of the original cloud service, and its performance for geographically distributed clients are comparable to those of encrypted cloud database services.

In this paper, we exhibit **Eucalyptus** [5][10]- an open-source programming structure for distributed computing that actualizes what is usually alluded to as framework as an administration of Infrastructure As Service (IaaS) frameworks that give clients the capacity to run and control whole virtual machine occurrences conveyed over an assortment physical assets.

We diagram the essential standards of the Eucalyptus outline, point of interest imperative operational parts of the framework, and talk about engineering exchange offs that we have made with a specific end goal to permit **EUCALYPTUS**

146. Improving the security in Cloud Computing and Internet of things Applications

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IMPROVING THE SECURITY IN CLOUD COMPUTING AND INTERNET OF THINGS APPLICATIONS

[1]B Ramana Reddy , Assistant Professor , Dept of CSE, Chaitanya Bharathi Institute of Technology
[2] Dr. Madhu B K , Professor, Dept of ISE, R.R Institute of Technology,

Abstract— we introduce the concept of zoning in order to solve the problem of security and stability in Cloud Computing. We will have different zoning strategies from different perspectives. When we implement zoning at the switch fabric level, we can implement name server-based zoning and hardware enforced zoning. However, both of the implementatsons have their drawbacks. According to Brocade zoning implementations, we come up with the particular configuration methods called software zoning combining the advantages of both implementations.

Keywords- *storage area network, zoning, implementation*

I.INTRODUCTION

With the growth of mass data storage require

M ent, SAN become the preferred scheme in solving the problems such as bandwidth, capacity, and management. The security of SAN has caused concerns in the industry. Whether the storage architecture is secure or not influences the security of valuable data storage in SAN devices. So, we introduce zoning to control illegal access to fabric resources and avoid various attacks against SAN.

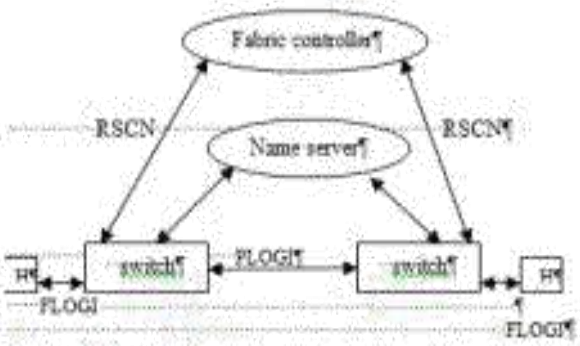
II. THE INFLUENCE OF ZONING ON STABILITY

It's very important to maintain a stable network when networks become more complicated. First, we should learn about the basic procedure that devices login with the Fabric in SAN. Then we can analyze the traffic difference between zoning and no zoning.

A. Basic procedure that devices login with the Fabric

Devices such as servers and disks need to connect with F port in the fabric. First, device sends frame named FLOGI(fabric login) to the fabric. When the device receives the acceptance frame from the fabric, it continues to transmit PLOGI(port login) to the name server in the fabric in order to login and register its information with the name server such as its world wide port name and world wide node name (WWN). When the device receives the corresponding acceptance frame from the fabric, and if the devices need to

be aware of the topology of the fabric timely, it will transmit SCR (state change registration) frame to the fabric controller. In this way, the devices will receive RSCN (register state change notification) frame when the topology of the fabric have changed.



B. Traffic fluctuation analysis

In the absence of zoning, once a device connects to or removes from the fabric, the name server will send RSCN message to all the devices having registered SCR in the fabric. Then the devices having received RSCN will send query frames as shown in Figure 1 in the right. (When receiving GNN_FT frame, the switch returns a list of port ids and node names having registered support for the specified FC-4 type. When receiving GPN_ID frame, the switch returns the registered port name for the specified port id).In a large fabric, this can result in a significant amount of fabric service traffic in a short time, which goes against stability. Instead, if we have set zones, fabric controller will send RSCN message only in the same zone(s) with the abnormal device, which ensures a small traffic fluctuation in a small extent. As shown in Figure 2, we implement zoning in a fabric so that we can do tape backup in heterogeneous operating circumstances. HBA1 and DISK2 use the same OS, such as WindowsNT, HBA2 and DISK3 use another OS, such as Sun Solaris. In this zoning implementation, both HBA1 and HBA2 will share the content of tape library

147. Prediction of heart disease using machine learning techniques

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Prediction of Heart Disease using Machine Learning Techniques

[1]S. Durga Devi,
[1] Assistant Professor , Department of CSE, CBIT, Hyderabad, India

Abstract : It might have happened so many times that you or someone yours need doctors help immediately, but they are not available due to some reason. The Health Prediction system is an end user support and online consultation project. Here I propose a system that allows users to get instant guidance on their health issues through an intelligent health care system online. The system is fed with various symptoms and the disease/illness associated with those symptoms. The system allows user to share their symptoms and issues. It then processes users symptoms to check for various illness that could be associated with it. Here the prediction model of heart disease is implemented using two machine learning techniques one is Linear Regression and another one is Neural Network. Linear Regression is used to determine critical factors that influence on heart diseases and Neural network model is used to predict of heart diseases. If the system is not able to provide suitable results, it informs the user about the type of disease or disorder it feels user's symptoms are associated with. It also consists of doctor address, contacts along with Feedback and administrator dashboard for system operations..

Index Terms - Linear Regression, Machine Learning, Neural Network.

I. Introduction

Now a days, health disease is increasing day by day due to life style, hereditary. Especially, heart disease has become more common these days, i.e. life of people is at risk. Heart disease is the biggest cause of death now a days. Blood pressure, cholesterol and pulse rate are the major reason for the heart disease. Some non-modifiable factors are also there such as

148.. Efficient File distribution in MANETs using Optimal File Replication protocol

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Efficient File Distribution in Mobile Ad Hoc Networks Using Optimal File Replication Protocol

1 G.R.Ramadevi, [2]M Pavan Kumar , [3] M .V Ramana Murthy
[4]Mr Ameer Saad Kadhim
[1]Assoc.Prof,SVIT, Patney x roads,Secandrabad-25.
[2]Department of Electronics & Communication Engineering, MVSR Engineering College, Nadargal, Hyderabad
[3], Department of Mathematics & Computer Science (M G I T ,) Osmania university , Hyderabad
[4]Asst Prof, Department of Mathematics & Computer Science , Osmania University, Hyderabad
Corresponding Author: G.R.Ramadevi

ABSTRACT-: *File sharing application in MANET has become more outstanding now days. In order to lower the file querying delay replication concept is performed. Since multiple user or in need of same files the request time delay. By implementing the replication concept time delay may be minimized. These become events additional evident in sparsely distributed MANET. A new concept of resource for file replication has been introduced that consider each node storage and meeting frequency. Extensive trace driven experiment results with synthesized traces and real traces show that our protocol can achieve minimize average querying delay at a lower cost when compare to current replication protocol.*

KEYWORDS- *MANET, Optimal File Replication with the RWP Model, Community-Based Mobility Model, Meeting Ability Distribution, and Design of the File Replication Protocol.*

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1 INTRODUCTION

In this paper, we tend to introduce a new idea of resource for file replication that considers every node storage and node meeting capability. we tend to on paper study the influence of resource allocation on the standard querying delay and derive an optimum file replication rule that allocate resources to each file supported its quality and size. We tend to then propose a file replication protocol supported the rule that approximates the minimum world querying delay in a fully distributed manner. We tend to like distributed File replication protocol which will approximately notice the optimum file replication rule with the two mobility models in a distributed manner. The term Mobile ad-hoc Network describe to a multi-hop packet based wireless network composed of a bunch of mobile nodes that will communicate and move at a similar time, without using any quite fixed wired infrastructure. Mobile ad hoc Network is really self organizing and adaptive networks that will be fashioned and deformed on-the fly while not the requirement of any centralize administration device. Otherwise, a stand for "Mobile ad hoc Network" is a type of ad hoc network that can change places and configure itself on the fly. As a result of Mobile ad hoc Network are mobile, they use wireless connections to connect to numerous networks. This may be a standard Wi-Fi connection, or another medium, like a cellular or satellite transmission. The aim of the Mobile ad hoc Network working group is to standardize IP routing protocol functionality appropriate for wireless routing application within every static and dynamic topologies with inflated dynamics due to node motion and various factors. Approaches are intended to be relatively light-weight in nature, applicable for multiple hardware and wireless domains, and address scenarios wherever MANETs are deployed at the edges of an IP infrastructure. Hybrid mesh infrastructures means a mixture of fixed and mobile routers should also be supported by MANE specifications and management features

149.. your safety, our concern

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Your Safety. Our Concern

Isha Padhy[1] , R Sreedhar[2] , C.V. Madhusudan Reddy[3]
Chaitanya Bharathi Institute of Technology[1], Sridevi Engineering College[2], Lords Institute of Engineering and Technology[3]

Abstract:
Accidents are un-intentional and unpredicted events which may lead to fatal conditions taking a precious life. This condition can be prevented if we can take certain steps which are accompanied with modern tools and technology. Here we have tried to take a small step towards this perspective. One of the main cause of the accidents is sudden appearance of an object may it be an animal, a unconscious human being or even a stationary vehicle. Here we have tried to take action both in case of an object in a shorter distance or a longer distance. The proposed system(Accident detection and accident prevention) ADAP uses ultrasonic sensors and Infrared sensors to detect an object straight and in its surrounding within 180D. The system can be mounted with the control system of the car.

Keywords: IR Sensors, Ultrasonic Sensors, Relay, Arduino.

1. Introduction:

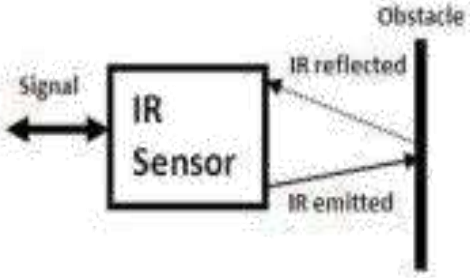
In modern world, there is an exponential increase in automobile usage with corresponding increase in population. Consequently, the accident rates have also increased due to distinct reasons. The accident prevention module attached to this system gives safety to the vehicle. In this module, we have connected the ultrasonic sensors on all sides of the vehicle which sends the distance upon detection of any obstacle and, IR sensors readings that will take action on the brakes of the vehicle automatically.

The required output from the system will be the data which is the approximate distance of the object from the vehicle from all sides, and a relay output generated by the IR sensors, connected to the front brakes of the car. The distance can be send to a serial output connected to a display device kept in-front of the driver, which also includes a voice saying the distance alert to the driver. Accordingly the driver can take action if the object distance is under his control. If the obstacle is much closer the IR sensors output will be send to relay which when in condition "1" puts 'on' the brakes.

2. Architectural design:

2.1 Infrared Sensors:

An infrared sensor is an electronic instrument which is used to sense certain characteristics of its surroundings by either emitting and/or detecting infrared radiation. Infrared sensors are also capable of measuring the heat being emitted by an object and detecting motion. A transmission medium is required for infrared transmission, which can be comprised of either a vacuum, the atmosphere or an optical fiber. An IR sensor consists of an emitter, detector and associated circuitry. The circuit required to make an IR sensor consists of two parts; the emitter circuit and the receiver circuit. The IR sensors reading are connected to a LED which glows on detection of an obstacle.



2.2 Ultrasonic Sensors:

Ultrasonic Sensors are designed to detect solid or liquid targets by using sound waves. These compact sensors provide enhanced flexibility for areas with limited space and are excellent for standard packaging and assembly applications. They are ideal

150. Understanding of case study concept in Software Engineering

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UNDERSTANDING OF CASE STUDY CONCEPT IN SOFTWARE ENGINEERING

K.Ramesh Babu[1], Chinnaraju[2], M.V.Ramanamurthy[2]

Abstract-Software engineering is a complex activity that naturally produces variety types of output. The term "case study" is used for a broad range of studies in software engineering. Case studies based on the external and independent observation of a software engineering activity. Collected data can either be defined or collected for the purpose of the case study, or already available data can be used in a case study. There is a need to clarify and unify the understanding of what is meant by a case study, and how a good case study is conducted and reported. Software engineering case study tends to learn towards a positive perspective, especially for explanatory-type studies. In this paper, we define theoretical understanding of case studies in software engineering.

Keywords : Case study, software engineering, Empirical enquiry, Strategy, REVV, Context, Triangulation, Statistical significance.

1. INTRODUCTION

Simply case study refers to a self-experienced and self-reported investigation. In broad sense, case study is an empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident [1]. Case studies are conducted with the objectives not only increasing knowledge but also bringing about change in the phenomenon being studied. There are different taxonomies used to classify research in software engineering. The term case study is used in parallel with terms like field study and observational study, each focusing on a particular aspect of the research methodology.

1.1 Characteristics Of The Case Study

In order to improve the standards of case studies, some good characteristics to be followed are:

- The study is of a significant topic.
- The study must be considering alternative perspectives on the topic.
- The study must present significant evidence.
- The reports of the case study must be engaging to the reader.
- The case study must respect the ethical, professional, and legal standards relevant to the study

1.2 Major Research Strategies

There are three other major research strategies that are to case studies, surveys, experiments, and action research.

1.3 Survey:

It is the "collection of standardized information from a specific population". Some sample surveys provide an overview rather than depth in the studied field [2].

2. EXPERIMENT OR CONTROLLED EXPERIMENT

It is characterized by "measuring the effects of manipulating one variable on another variable" and that "subjects are assigned to treatments by random" [3]. The effect of one specific variable is studied in experiments. Quasi-experiments are similar to controlled experiments, except that subjects are not randomly assigned to treatments.

3. ACTION RESEARCH

Studies involving change are sometimes denoted action research [4]. In software process improvement and technology transfer studies, the research method has clear characteristics of action research, with its purpose to "influence or change some aspect of whatever is the focus of the research"to case study. In IS, where action research is widely used, there is a discussion on finding the balance between action and research [5].

[1] Department of Mathematics, MVSR Engineering College, Nadargul, Hyderabad
[2] Department of Computer Science and Engineering, CBIT, MGIT, Gandipet, Hyderabad

179. Reconnoitring the Higher education systems using Big data Analytics

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Reconnoitring the Higher Education Systems using Big Data Analytics

D. Naga Jyothi[1], Dr. Y. Rama Devi[2]

[1]Assistant Prof., CSE, CBIT, Telangana, India

[2]Professor, CSE, CBIT, Telangana, India

Abstract: *Now-a-days large amounts of data are needed to be gathered due to the increased competition and thus many companies are having lots of terabytes of data to be stored and analyzed. There is lots of data generated at high volume, velocity and variety based on the sources it is coming from. This is the scenario where we need complex analytics to deal with Big data. So far, most database management innovation has not kept pace. Performing ad hoc queries on such large data volumes does not work naturally for existing database management systems (DBMS), which use a row-oriented design for write-intensive transaction processing rather than for read-intensive analytics. The traditional view of big data is not enough. Rather than focusing exclusively on what technology big data brings, it has to be looked as to what value it can create. Big data is insignificant in a vacuum. Its potential is unlocked only when leveraged to drive decision making. To enable such evidence- based decision making, organizations need efficient processes to turn high volumes of fast- moving and diverse data into meaningful insights. Thus, the current research explores mainly on big data analytics, the main opportunities it gives rise to, and how big data should be expanded to support analytics. This research paper presents application of big data analytics on Higher Education aspects to choose more education models, which can enhance the performance of the instructors and students. In spite of the increasing opportunities for instructors and students, online learning also brings challenges due to the absence of direct human contact. Online environments allow the generation of large amounts of data related to learning/teaching processes, which offers the possibility of extracting valuable information that may be employed to improve students' performance. This paper includes various analytics' approaches and the educational data mining and learning analytics.*

Keywords: Big data, Big data analytics, educational data mining, learning analytics

1. Introduction

The overall process of extracting intuitions from big data is divided into Data Management and Analytics. **Data Management** involves processes and supporting technologies to acquire and store data and to prepare and retrieve it for analysis. **Analytics** refers to the techniques used to analyse and acquire intelligence from big data. The user organizations are implementing definite forms of analytics, particularly what is sometimes called advanced analytics. This is a collection of associated techniques and tool types, usually including predictive analytics, data mining, statistical analysis, and complex SQL. The list can be extended to cover data visualization, artificial intelligence, natural language processing, and database capabilities that support analytics (such as MapReduce, in-database analytics, in-memory databases, columnar data stores).

All these techniques have been around for years, many of them appearing in the 1990s. The difference today is that many user organizations are using them. That's because most of these techniques adapt well to very large, multi-terabyte data sets with minimal data preparation that brings us to big data (fig.1).

1.1 Defining Big Data Via the five Vs

Most definitions of big data focus on the size of data(volume) in storage. Size matters, but there are other important attributes of big data, namely data variety, velocity, value and veracity.

Velocity denotes the speed at which vast amounts of data are being generated, collected and analyzed. **Volume** refers to the incredible amounts of data generated each second from social media, cell phones, cars, credit cards, M2M sensors, photographs, video, etc (fig.3). Collecting and analyzing this data is clearly an engineering challenge of immensely vast proportions. **Value** refers to the worth of the data being extracted. Having endless amounts of data is one thing, but unless it can be turned into value it is useless. **Variety** is defined as the diverse types of data that can be used. **Veracity** is the quality or trustworthiness of the data, as to know how accurate is all this data.

The popular discourse on big data, which is dominated and influenced by the marketing efforts of large software and hardware developers, focuses on predictive analytics and structured data. It ignores the largest component of big data, which is unstructured and is available as audio, images, video, and unstructured text (fig. 2). It is estimated that the analytics-ready structured data forms only a small subset of big data. The unstructured data, especially data in video format, is the largest component of big data that is only partially archived.

Figure 1: Big data related

180.. Infuence of Anger and Anxiety in elevating the blood pressure: using machine learning approaches

INFLUENCE OF ANGER AND ANXIETY IN ELEVATING THE HIGH BLOOD PRESSURE: USING MACHINE LEARNING APPROACHES

Satyanarayana Nimmala, Dr. Y. Ramadevi, R. Sarath

ABSTRACT

In the present days most of the people are suffering from anger and anxiety at some point in time in their life. Though getting anger is common for many but frequently getting anger, continuing the same for a longer period of time has an adverse effect on the human body. Suffering from Anxiety may enable the fight or flight mode of the central nervous system. This elevates the blood pressure for shorter period of time. There may be different reasons for a person to suffer from anger and anxiety, but if it is chronic it may elevate blood pressure of a person. If the elevated blood pressure is more than the normal range, it is considered as high blood pressure (HBP) or hypertension. In this paper we considered anger level and anxiety level of a person to predict whether the person is prone to HBP or not. Anger and anxiety level of a person is measured using response obtained from the set of predefined questionnaire. We considered 1000 records For Experimental analysis, where each record consists of anger and anxiety level of a person along with systolic, diastolic and mean arterial blood pressure. Experiments are conducted using various machine learning algorithms. We used 50% records to train the model, 50% records to test the model. Results unfolds that there is significant influence of anger level and anxiety level in elevating the blood pressure.

181.. Identifcation of Rare Diseases: An Outlier Analysis Approach

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Identification of Rare Diseases: An Outlier Analysis Approach

Lakshmi Sreenivasa Reddy D
Department of Information Technology
Chaitanya Bharathi Institute of Technology
Hyderabad, India.

S Chinaramu
Department of Computer Science & Engineering
Chaitanya Bharathi Institute of Technology
Hyderabad, India.

Abstract

In health industry, identification of most common diseases is very easy from health diagnosis data. Many frequency based algorithms are available to identify most frequent diseases. But there is little number of algorithms available to apply for low frequent diseases. In this paper some of the existing algorithms are applied to identify rare diseases and then optimized these algorithms to identify rare diseases automatically from huge amount of diagnosis data. Cancer data is used for experiments. Cancer data is collected from UCI ML repository [1]. The objective of the proposed work is to model a scientific method to detect rare diseases from diagnosis data. In this paper three models have been trained on the said data and detected these diseases automatically using Gaussian distribution. The main models along with Gaussian used here are Outlier factor by infrequency (OFI), Attribute value frequency (AVF) and BAD. Using these models with Gaussian achieved good accuracy.

Keywords: Cancer data, ECG data, Outlier, Classifier, Accuracy

INTRODUCTION

Outlier analysis is one of the important concepts in most applications. Most existing algorithms concentrated on numerical or ordinal attributes. Health diagnosis data includes more categorical attributes can be generalized and converted into numerical values. This procedure is not always preferable. This paper presents a simple method for categorical data. AVF method is one of the simple and efficient methods to detect outliers in categorical data. It calculates frequency of each attribute value in each attribute and finds their probabilities. This method calculates attribute value frequency score for each record by taking the average of all attribute value frequencies which are included in respected records. Outliers are records with lowest AVF scores. The only parameter used in this method is "k", the no. of outliers. FPOF is another frequent based method which depends on frequent patterns adopted from Apriori algorithm [3]. This method calculates frequent patterns of attribute values at different levels on each record. It calculates FPOF score from these patterns and finds the least FPOF scored records based on FPOF scores. These least score records are called outliers. This method requires two parameters. 'k' , the no. of required outliers and a threshold value to decide frequent patterns. Time complexity of FPOF is more in detecting outliers when compared with AVF method. The parameters used in FPOF are σ, a threshold value which is useful to decide frequent patterns in each record. There are other methods available for categorical data based on Entropy score. Greedy [4] is another method to detect outliers from categorical data. The existing approaches used to detect outliers were.

EXISTING METHODS FOR NUMERICAL DATA

A. Satistical base methods

Statistical Methods describe mostly the distribution of the data and uses univariate. These methods adopt a parametric model [3, 4]. Statistical methods have many drawbacks as the number of variables increases its efficiency decreases [4]. These draw backs can be rectified by applying principal component analysis (PCA). Attribute relevance analysis is another technique to rectify this problem. These ideas are useful for more dimensions in any Dataset.

B. Distance-based methods

Distance based methods do not take any assumptions on the distribution of the data objects because of computing the distances between all records. Complexity of these methods is very high. Large datasets with more records do not prefer these methods. Knorr's et al. [5], explained that apart of dataset records belong to each outlier must be less than some threshold value and achieved some improvements in this regard.

C. Density based methods

Density base methods find frequencies of the data records and identify anomalies as those lying in areas with low frequency. Breunig et al. described a local outlier factor (LOF) to identify local outliers based on a record contains sufficient neighbor around it or not [6]. LOF decides any record as an outlier if its LOF is less than the user defined threshold. Papadimitriou et al. defined similar methods called Local Correlation Integral (LCI). LCI selects the minimum points (min pts) in LOF through statistical methods [7]. The density based methods can detect outliers those are left by techniques with single, global criterion methods.

182.. A Hybrid of improved bulls and Weighted Round robin to Optimize the leader of load balancing in cloud and distributed Computing Environments

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A Hybrid of Improved Bulls and Weighted Round Robin to optimize the Leader and Load Balancing in Cloud and Distributed Computing Environment

Suvarna Lakshmi C,
Assistant Professor,
Dept of Computer Science,
Aurora's Degree and P.G. College,
Chikkadapally, Hyderabad,
Telangana, India.
vcsl189@gmail.com

M. V. Ramana Murthy,
Professor & Head,
Dept. Of Mathematics & Computer Science
MGIT, Gandipet, Hyderabad,
Telangana, India.
mv.rm50@gmail.com

Rajani Bellamkonda
Asst. Professor, Dept. of Computer Science,
Aurora's Degree and P.G. College
Chikkadapalli, Hyderabad,
Telangana, India
Email-id: bkrajani@gmail.com

S. China Ramu
Assoc. Professor, Dept. of CSE,
CBIT, Gandipet, Hyderabad, Telangana,
India,
Email-id: chinaramu@cbit.ac.in

Abstract: Day by Day there is increase of internet users which leads to increase the traffic in the network which causing the generation of huge data. It requires the balancing of network load on the network servers with different Load balancing techniques. It is also required to have efficient algorithm to analysis the huge data in distributed manner to identify the leader to act as centralized point of contact for services. If we audit on the heap adjusting systems, there are a few potential outcomes to upgrade the methods. In the present scenario, we have the methods, round robin algorithm (static load adjusting), Weighted Round Robin algorithm and Least Load algorithm (Dynamic Load Balancing). A researcher D. Chitra Devi .et .al has given the idea of enhanced weighted round robin algorithm (EWRR) which gives much better reaction when contrasted with basic round robin calculation. Another scholar Rashmi Soni et. al recommended the half breed of round robin calculation and minimum Load Algorithm.

From the above scholars' articles, I hereby propose a resolution by improved Bulls algorithm along with Weighted Round Robin (WRR) algorithm to achieve high performance in Distributed and Cloud Computing domain in terms of leader election from a group of distributed and non-failed processes, load balancing dynamically and coordinate other nodes.

Bulls algorithm uses the following message types:

- **Election Message**: Sent to announce election.
- **Answer (Alive) Message**: Responds to the Election message.
- **Coordinator (Victory) Message**: Sent by winner of the election to announce victory.

When coordinator fails to recover a process P, from failure or detecting before failure, the process P performs the following actions:

1. If P has the highest process id, it sends a Victory message to all other processes and becomes the new Coordinator. Otherwise, P broadcasts an Election message to all other processes with higher process IDs than itself.
2. If P does not receive any Election message, then it broadcasts a Victory message to all other processes and becomes the Coordinator.
3. If P receives an Answer from a process with a higher ID, it sends no further messages for this election and waits for a Victory message. When there is no Victory message after a stipulated period, it restarts the process from the beginning.
4. If P receives an Election message from another process with a lower ID it sends an Answer message back and starts the election process at the beginning, by sending an Election message to higher-numbered processes.
5. If P receives a Coordinator message, it treats the sender as the coordinator.

Keywords: *Bulls Algorithm, Cloud computing, Distributed systems, Load Balancing, weighted round robin, least load balancing algorithm.*

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183.. A Review on the Intelligence of Things

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A REVIEW ON THE INTELLIGENCE OF THINGS

R Ravinder Reddy[1], G Bharath Kumar Reddy[2],
Ch Mamatha[3],
CBIT, CVSR, JBIET
[1]ravindra_rkk@cbit.ac.in,
[2]bharathreddygogula@gmail.com,
[3]mamatha.ramasani@gmail.com

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Abstract

The Internet of Things (IoT) is the game changing technology in the real world environment by collecting the lot of data from different objects. The gathered data and intelligence pumped to an environment will extract the knowledge; It will enhance and reorient the newer trends of business and applications. This will be treated as the Intelligence of Things, it will be more generous for the future of the people. The Internet of Things is making everyday objects into data factories. With enough of these devices, with enough data and the right artificial intelligence tool results in a recipe for something new and something big. The Intelligence is being the major part of the IoT, it gives why and what purpose of this. The IoT has various application domains like health care, home surveillance, how automation and many more. Because of all these applications it has many sources of generating huge amounts of data. IoT has become the major data source for the big data analytics. In these days everything is treated as a data source like phone, camera, sensor etc, the intelligence has become crucial part of all these IoT devices, just based on the intelligence how the things are

184. A Survey on the assessment of models towards automated free text marking engine

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A Survey on the Assessment of Models towards Automated Free-Text Marking Engine

Srujana Inturi
Assistant Professor, Department of CSE, CBIT, Hyderabad

Abstract

Automated free text response grading has been proposed for more than thirty years. Just as of late have practical implementations been built and tried. This paper portrays the theoretical models for four executed system depicted in the writing, and assesses their strengths and weaknesses. Every one of the four models make utilization of correlations with one or numerous model answer documents that have been already evaluated by human markers. One cross breed system that makes utilization of some phonetic features, joined with document qualities, is appeared to be a practical arrangement at display. Another system that makes utilization of essentially linguistics features is additionally appeared to be successful. A usage that overlooks etymological and document features, and works on the "bag of words" approach, is then talked about. At last an approach utilizing text categorization techniques is considered.

Index Terms : Short Answer, Grading System, Question, Conceptual Models, Free-Text Marking Engine

I. INTRODUCTION

Showing staff far and wide are looked with an unendingly repeating issue: how would they limit the measure of time spent on the moderately dull undertakings related with grading their understudies' free text responses. With the coming of substantial understudy numbers, often included thousands in first year normal center units, the grading load has turned out to be both tedious and expensive. A system that can computerize the errands is as of now only a fantasy for generally staff.

One of the most punctual notices of computer grading of free text responses in the writing was in an article by Page in which he depicted Project Essay Grade (PEG). (Page, 1966). Different parts of understudies' essays, for example, extent of words on a typical word list going about as an intermediary for lingual authority, and the extent of relational words going about as an intermediary for sentence multifaceted nature, were estimated. A various relapse method was then used to anticipate the human rater's score, in view of these measures. We talk about the most recent form of PEG later in this article. Page made a distinction, which is still relevant today, between grading for content and grading for style. "Content" refers loosely to what the free text response says, and "style" refers to syntax and mechanics and diction and other aspects of the way it is said." (Page, 1966: 240). This dichotomy gives us the basis for classifying the systems that have been developed : do they grade primarily for subject matter, or for linguistic style. And, do we measure proxies for these dimensions (rating simulation), or do we measure the actual dimensions (master analysis). Figure 1 shows the resulting four categories.

	I Content	II Style
A. Rating Simulation	I(A)	II(A)
B. Master Analysis	I(B)	II(B)

Figure 1: Possible Dimensions of Free Text Response Grading (Source: Page, 1966: 240)

There are inalienable issues to be overcome if automated grading of text is to end up a reality. Understudy essays tending to a specific point can theoretically be communicated in potentially thousands of structures, utilizing distinctive blends of words and sentences.

Essentially checking for the event of some catchphrases does not take into consideration an exceptionally precise evaluation of the work, nor does it take into consideration the wealth and decent variety that English takes into consideration articulation of thoughts. Numerous words have thirty to forty passages in a thesaurus, and for the most part a significant number of them are compatible in a specific and given context, so checking for the event of watchwords isn't a satisfactory approach.

The existing free text response grading systems(FTGS) as falling into broad themes and time periods, from which our literature review is modeled . Here, each category is an "era" in the field of FTGS , to emphasize the historical organization as shown in figure 2.

185.. A Novel Approach for Automated Essay Scoring using Vector Space Models and Natural Language Processing Techniques

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A Novel Approach for Automated Essay Scoring using Vector Space Models and Natural Language Processing Techniques

[1]Srujana Inturi, [2]A Sangeetha

[1]Asst Professor, Department of CSE, CBIT, Hyderabad

[2]Asst Professor, Department of CSE, CBIT, Hyderabad

ABSTRACT— *In the field of education, essay question is considered as the most appropriate question types for assessment compared to closed questions to evaluate the knowledge of the students. However, evaluation of answers of essay type questions consumes a long time, effort and includes unavoidable human errors. Currently there are many current Automated Essay Scoring (AES) systems however there structures are not successful sufficient to offer an correct rating and most of them aren't freely available. The recognition of this research is to present a unique approach for AES the usage of Vector Space Models (VSMs) and Natural Language Processing strategies. It employs version answer primarily based evaluation for the scoring technique. In order to deal with variations inside the college students' essay solutions, NLP techniques (lemmatization, tokenization, managing of spelling mistakes, relation of gadgets, higher and decrease case of phrases, short term decision) were used. Proposed approach does not want any pre-schooling prior to every essay questions compared to maximum of the prevailing systems.*

1. INTRODUCTION

The Intelligent Essay Assessor is business software that grades essays as it should be as professional human graders. The need for laptop-assisted evaluation of gaining knowledge of outcomes is connected to two inter-associated elements in today's training and schooling markets. First, instructors want to automate the evaluation and assessment method particularly in mass publications. Secondly, a student, especially while following a web course, may also need to assess the diploma of his or her personal studying process prior to an exam. Evaluation is a extensive concept which covers each formal and informal feedback, executed either explicitly or implicitly. In this paper, we use the time period assessment in reference to formal evaluation (i.e. measuring the studying outcomes with a numerical grade). Many of the automatic assessment structures do now not completely make use of the capacity of available technology. Too frequently, teachers and students ought to be glad with automated more than one preference questions. Essay assignments, as compared with multiple preference and choice duties, have many blessings. Written responses require college students to generate solutions which show better order thinking abilities such as synthesis and analysis.

186. Performance Analysis of Learning Models on Medical Documents

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Performance Analysis of Learning Models on Medical Documents

Vanitha Guda[1], Manish Golla[2], Akhilesh Datta[3]
[1]Assistant Professor, CSE Department, Chaitanya Bharathi Institute of Technology (A),Hyderabad.
[2,3]BE Computer Science Engineering, CBIT(A),Hyderabad

Abstract- With the exponential growth of online text, Text Classification domain becomes the major field of Natural language Processing and Machine learning. In this context Medical Document Classification is one of the popular research problems to analyze the high dimensionality features of medical data. Our Study considered various learning models and their performances over the medical documents and we considered OSUMED is one of the popular datasets containing MEDLINE documents as multi-labelled documents. Choosing a high accuracy classifier for text classification is still a challenging task for many of the practitioners. Our work aims to find the efficiency in classifiers and comparing the accuracy in classifying medical documents with well-known classifiers Naïve Bayes, Decision Tree, Support Vector Machine (Linear) and Stochastic Gradient Descent (SGDC). The performance of a feature selection method namely Univariate Feature Selection is analyzed using pattern classifiers namely Naïve Bayes, Decision Tree, Support Vector Machine (Linear) and SGDC and the obtained experimental results shows that the combination of Univariate Feature Selector and Support Vector Machines classifier gives more accurate results in most cases than the others.

Index Terms- Classifier's Accuracy, Document classification, Feature Selection, Learning Models, Medical Documents, Text Classification.

I. INTRODUCTION

With the rapid growth in usage of web sources, Internet technology leads to proportional increment to the generation of electronic documents in this context the concept of automatic text categorization and classification got significant importance. Automatic text classification is an approach which assigns the electronic documents to the referred and appropriate classes based on the content [1]. Text classification is the process to solve different problems like filtering of classification of web pages [2], author identification [3], spam e-mails [4], and classification of medical text documents [5][6][7].

In the research field of Text classification medical documents classification is the specific task. Most of the researches relate the medical abstracts from the MEDLINE database [8], it is a bibliographic database containing nearly 21 million documents, about 5600 medical journals, and it consists of medical abstracts in english those are assigned to some categories namely medical subject headings (MeSH). Ohsumed is the most used dataset for automatic classification of MEDLINE documents, it is a multi-label in structure and contains medical abstracts in English for 23 types of diseases.

Several existing works carried out in the field of medical domain, but most of the existing works and the studies are about the usage of medical words, phrases, and their combinations as features for the document classification. The obtained results are explaining that using combination of words and phrases as features gives slightly better classification performances than the others. In another work the study about multi-label classification performance based on associative classifier is examined on medical articles [9], in another work, HMM - hidden Markov models are used for classification [10]. One of the recent works, an approach using support vector machines and latent semantic indexing is applied to some datasets including the ones consisting of medical abstracts [11].

Classification is one example of pattern recognition. In Daily routines hospital databases generates huge amounts of data and most of the researchers in this field evaluate their classification methodologies on medical documents retrieved from MEDLINE database. Extraction of useful information from online is a challenge because most of the documents

187.Performance Evaluation and Prevention of Black hole attack in MANET

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Performance Evaluation and Prevention of Black hole attack in MANET

Vinnela Manohara Ruth P, Kavita Agarwal, Somnath Parachuri, Vamshi Krishna Gundu
Department of Computer Science and Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India

ABSTRACT

Mobile Ad-hoc NETwork (MANET) is a collection of mobile nodes which are wire-less, self-organized and infrastructure-less where communication between the nodes is through radio waves. Therefore, security becomes a highly challenging issue in MANET's. Malicious nodes in the network may lead to security breach and degrades the performance of the network. In black hole attack, malicious node will advertise itself as having a fresh route towards destination and starts dropping the packets thereby degrading the performance and reliability of the network. In this paper, the performance metrics of a MANET such as Throughput, Packet Delivery Ratio and Packet Loss are evaluated using single and multiple malicious nodes. A fake routing protocol is proposed to prevent black hole attacks imposed by both single and multiple black hole nodes. Simulation results show that the proposed protocol provides better performance in terms of packet delivery, throughput and packet loss in presence of black holes and helps in prevention of black hole attack.

Keywords : Black hole, Fake routing protocol, MANET, Network Animator, NS2.

I. INTRODUCTION

MANET is are suitable for Military networking requirements, safety/rescue operations, wearable computing and communications, satellite-based information delivery and finally in scenarios requiring rapidly-deployable communications with survivable, dynamic networking mobile data exchange (RFC 2501). There are many issues in MANET such as Routing, Attack, Topology Management, Context awareness, Identity Management, Power Management, etc. Due to the openness in network topology and the absence of centralized administration in management, MANETs are vulnerable to attacks from Black hole nodes. The packet loss due to the Black hole nodes has been detected and to be isolated from the mobile ad-hoc network to increase the reliability of the network. The proposed work is to prevent attacks from Black hole nodes and improve the security performance of the whole network, especially in terms of packet delivery ratio, average end-to-end delay. To overcome this, a Dynamic trust prediction model is proposed. This model is used to calculate the trust value, which is based on the nodes historical behavior as well as the future behavior. By using this, one can detect the untrustworthy nodes, obtain a reliable packet delivery route and alleviate the attacks from Black hole nodes that provide a flexible and feasible approach to choose the shortest route that meets the security requirements of data packet transmission.

II. RELATED WORKS

Fan-Hsun Tseng et al., [1] provided a survey of attacks and countermeasures in MANET. The countermeasures are features or functions that reduce or eliminate security vulnerabilities and attacks. First, they have given an overview of attacks according to the protocol layers, and to security attributes and mechanisms. Then they presented preventive approaches following the order of the layered protocol layers. They also put forward an overview of MANET intrusion detection systems (IDS), which are reactive approaches to thwart attacks and used as a second line

188. Intrusion Detection System Using Feature Selection Approach

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Intrusion Detection System Using Feature Selection Approach

[1]K.Spandana, [2]M.Bhanu Chandrika
[1]CSE Department, [2] CSE Department
CBIT, Hyderabad
Email - spandana.k@cbit.ac.in, bhanu.mchandi@gmail.com

Abstract: *A tremendous growth in the usage of internet services has raised various concerns pertaining to the protection of internet applications and computer networks against threats from ever evolving cyber attacks. Therefore, the development of effective and adaptive security approaches has become extremely important, since traditional security techniques such as user authentication, firewalls and data encryption, are insufficient to fully cover the entire landscape of network security. Hence, another line of security defense is highly recommended, such as Intrusion Detection System (IDS), which is s a device or software application that monitors a network or systems for malicious activities or policy violations. Any such detected activity or violation is typically either reported to an administrator or collected centrally using a security information and event management system. This project aims to introduce an Intrusion Detection System (IDS) named Least Square Support Vector Machine based IDS (LSSVMIDS), that will be constructed using the features selected by the proposed feature selection algorithm which will analytically select the optimal feature for classification of patterns that do not match normal network traffic.*

Key Words: *Intrusion Detection System (IDS), Least Square Support Vector Machine based IDS (LSSVMIDS), Cyber Attacks*

1. INTRODUCTION:

Network traffic classification is often impacted with certain long-term problems such as extraneous and unessential features present in data, which not only slow down the process of classification but also prevent a classifier from making well-informed and accurate decisions, which are free from bias, especially when coping with vast amounts of data. An unsupervised mutual information-based approach that can be used to rationally determine the most favourable features for classification is proposed in order to aid the classification and intrusion detection processes. This mutual information-based feature selection algorithm can handle linearly and nonlinearly dependent data features, whose effectiveness can be studied and evaluated in the cases of network intrusion detection. A Least Square Support Vector Machine based IDS (LSSVM-IDS), is used for this purpose. The IDS is built using the features selected by the proposed feature selection approach and its performance will be analyzed using a standard intrusion detection evaluation dataset, namely the KDD Cup 99 dataset.

2. LITERATURE REVIEW:

Feature selection is a technique for eliminating irrelevant and redundant features in order to obtain most optimal subset of features that produce a better characterization of patterns belonging to different classes. Methods for feature selection are generally classified into filter and wrapper methods [1]. Filter algorithms utilize an independent measure (such as, information measures, distance measures, or consistency measures) as a criterion for estimating the relation of a set of features, while wrapper algorithms make use of particular learning algorithms to evaluate the value of features. In comparison with filter methods, wrapper methods are often much more computationally expensive when dealing with high dimensional data or large scale data. In this study hence, we focus on filter methods for IDS. Due to the continuous growth of data dimensionality, feature selection as a preprocessing step is becoming an essential part in building intrusion detection systems [3]. Recently, Ambusaidi and Nanda [2] proposed a forward feature selection algorithm using the mutual information method to measure the relation among features. The optimal feature set was then used to train the LS-SVM classifier and to build the IDS. Pervez and Farid [3] presented an intrusion classification approach based on the combination of feature selection and SVM classifier, which achieved 99% accuracy using three features.

3. METHODOLOGY:

The architecture of the proposed system contains the following modules as shown in the figure 1.
1. Data collection 2• Data Preprocessing 3• Filter based feature selection 4 • Attack classification & Recognition 5• Performance Evaluation

189 Development of IoT based smart security and monitoring device for agriculture

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Development of IoT Based Smart security and monitoring Device for Agriculture

G.Kavita[1], Kotnak. Suryanarayana[2]
[1]Assistant Professor, CSE, Department of Computer Science and Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad, INDIA
[2]M.Tech 2/2 CSE, Department of Computer Science and Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad, INDIA

Abstract- Agriculture plays a vital role in the development of agricultural country. Security in agricultural field is required not only in terms of resources but also for agricultural products. Protection at very initial stages, like protection from attacks of rodents or insects, in fields or grain stores are needed. In the context of providing smart security and monitoring the system, for agriculture can be addressed by integrating the agricultural system with internet of things (IoT). Using Raspberry pi and various sensors, the efficiency in agriculture can be improved. The information generated from different sensors are sent to main server using Raspberry pi. All the parameters in the agricultural field can be controlled and monitored from remote location. This paper addresses, solving problems like identification of rodents, threats to crops and delivering real time notification based on information analysis and processing without human intervention.

***Index Terms*- Agriculture, security, internet of things, raspberry pi, PIR sensor, URD sensor.**

I. INTRODUCTION

The term Internet of Things was first proposed by Kevin Ashton in 1982. Internet of Things (IoT) is an environment of connected physical objects that are accessible through the internet. The 'thing' in IoT could be any object with build-in-sensors that have been assigned an IP address and have the ability to collect and transfer data over a network without manual assistance . IoT is a combination of hardware and software technologies along with embedded devices which enables to provide services and facilities to anyone, anytime, anywhere required using any network. The connectivity then helps us to capture more data from more places, ensuring more ways of increasing efficiency and improving safety and IoT security. IoT is transformational services that can assist companies improve performance through IoT analytics and IoT Security to convey better outcome. Businesses in the utilities, oil & gas, insurance, manufacturing, transportation, infrastructure and retail sectors can reap the benefits of IoT by making more informed decisions, aided by the torrent of interactional and transactional data at their disposal. The interconnection of these sensor devices , is expected to lead in automation in almost all fields, while also enabling advanced applications like a smart grid, and expanding to areas such as smart cities.

Fig 1: Application of IOT

The health care applications are increasing more day by day because of sensor devices. The IoT has the potential to give rise to many medical applications such as glucose level sensing, ECG monitoring, blood pressure monitoring, body temperature monitoring. The healthcare system mostly tries to work on the wireless sensor networks, embedded device technologies and ubiquitous computing. IoT systems need to provide the services to anyone at anytime and anywhere. IoT applications can be proved to be very effective in the agriculture

190. A Review on mining textual information from Biomedical data

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A Review on Mining Textual Information from Biomedical Data

K.Mary Sudha Rani[1], T.Krishnaveni[2]
[1]Assistant Professor, Department of CSE, CBIT, Hyderabad
[2]M.Tech, Department of CSE, CBIT, Hyderabad

Abstract- This paper presents a review on bio-medical text mining from scientific documents involving event extraction which is used to explore the data biomedical data in an easy and comprehensive manner. Information extraction is a challenging task from the biological texts as it considers many aspects from different areas such as natural language extraction, statistics and machine learning models. This event extraction involves a series of steps from preprocessing to post processing which includes many intermediate methods to represent in different patterns. This paper describes different resources available for biomedical text mining, information extraction and recent machine learning methods that are significantly used.

I. INTRODUCTION

Biomedical text mining is a text mining which is applied on text and scientific documents. Biological systems consist of entities and the relationships between them in terms of how they interact and the downstream effects of such interactions. Automatic extraction of events have wide range of applications in molecular biology which support for the creation and annotation of pathways to improve the performances of databases. Event extraction systems can be trained to recognize a wide range of activities, including protein–protein interactions, pathway enrichment and construction, gene regulatory events, and metabolic or signaling reactions.

This survey begins with identification of resources for mining the biomedical literature ,event extraction and machine learning methods. This concludes with an expectation for further development of the domain.

2. BIOMEDICAL TEXT MINING IN DIFFERENT FIELDS

2.1 Protein-protein interactions based on graph kernel method[7]

Biomedical text mining is very essential in finding the extracting the complex interactions between proteins. These studies mainly involve the effects of training and testing on different resources for providing protein pairs. This graphical method is based on dependency scheme which gives the user a contextual and syntactic information which is needed to distinguish between interactions and non interactions. The dependency structures parser make the relationships between words which directly interacts with the parser. This process proposes three approach such as subsequence kernels , tree kernels and shortest path kernels for relation extraction. This is method that captures information in unrestricted dependency graphs to a format that kernel based learning algorithms can process. These interactions re not only binary but multiple complex structures will also be considered.

2. Bio-molecular event extraction[1]

Biomedical text mining used for recognizing the events in the text and also for identifying approaches to automatic event extraction. These events mainly includes genes, enzymes or transcription factors which play major role in biological processes. Event extraction mainly involves information retrieval, discovery and knowledge summarization. This describes the event extraction from preprocessing event extraction to post processing including entity recognition, trigger detection and edge detection.

3. Biological network extraction[8]

Biomedical text mining a way for network extraction to indicate the interactions between the bio-molecular events .this is done mainly to reduce the complexity and increase the functionality with gives completeness to the extracted network. This network

191. Analysis of Road Accident Locations Using DBSCAN Algorithm

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Analysis of Road Accident Locations Using DBSCAN Algorithm

Kavita Agrawal, Vimala Manohara Ruth, Nandini Y, Sravani K
Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India

ABSTRACT

Road and traffic accidents are one of the important problems in India. However, as accidents are unpredictable and can occur in any type of situation, there is no guarantee that this trend will sustain in future also. Therefore, the identification of different geographical locations where most of the accidents have occurred and determining the various characteristics related to road accidents at these locations will help to understand the different circumstances of accident occurrence. In this paper we apply data mining algorithms on accident dataset as an attempt to address this problem. Association rules were discovered by Apriori algorithm, clusters containing accident prone areas were formed by DBSCAN Algorithm, an android application using fragments was developed to alert the user when he/she enters cluster regions i.e. accident prone areas (ARP) by sending user popup message.

Keywords : Association Rule Mining, DBSCAN algorithm, Apriori Algorithm

I. INTRODUCTION

In recent years, because of too much travel speed of road traffic, the accidents have been increasing on yearly basis. Road accidents happen quite frequently and they claim too many lives every year. Sometimes, it is found that road accident occurrences are more frequent at certain specific locations. The analysis of these locations can help in identifying certain road accident features that make a road accident to occur frequently in these locations.

Data mining uses many different techniques and algorithms to discover the relationship in large amount of data. It is considered one of the most important tool. Association rule mining algorithm is a popular methodology to identify the significant relations between the data stored in large dataset and also plays a very important role in frequent item set mining. A classical association rule mining method is the Apriori Algorithm whose main task is to find frequent item sets, which is the method we use to analyse data.

Clustering is a process of making a group of abstract objects into classes of similar objects. One of the common clustering method is the DBSCAN algorithm is used. It is a density based clustering algorithm: given a set of points in space, it groups together points with many nearby neighbours.

Using Map Activity we created maps in android studio. GPS of the user is tracked using user's latitude and longitude. Using Marker, position of the user is marked. Clusters (Accident prone areas) are also marked in application.

We used an accident dataset ,refer to fig 1 which is provided by Traffic police control office. It contains details of accidents that occurred between 2010 and 2017.The dataset contains 11596 records.

192.Reconnoitring the Higher education systems using Big data Analytics

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Reconnoitring the Higher Education Systems using Big Data Analytics

D. Naga Jyothi[1], Dr. Y. Rama Devi[2]

[1]Assistant Prof., CSE, CBIT, Telangana, India

[2]Professor, CSE, CBIT, Telangana, India

Abstract: *Now-a-days large amounts of data are needed to be gathered due to the increased competition and thus many companies are having lots of terabytes of data to be stored and analysed. There is lots of data generated at high volume, velocity and variety based on the sources it is coming from. This is the scenario where we need complex analytics to deal with Big data. So far, most database management innovation has not kept pace. Performing ad hoc queries on such large data volumes does not work naturally for existing database management systems (DBMS), which use a row-oriented design for write-intensive transaction processing rather than for read-intensive analytics. The traditional view of big data is not enough. Rather than focusing exclusively on what technology big data brings, it has to be looked as to what value it can create. Big data is insignificant in a vacuum. Its potential is unlocked only when leveraged to drive decision making. To enable such evidence- based decision making, organizations need efficient processes to turn high volumes of fast- moving and diverse data into meaningful insights. Thus, the current research explores mainly on big data analytics, the main opportunities it gives rise to, and how big data should be expanded to support analytics. This research paper presents application of big data analytics on Higher Education aspects to choose more education models, which can enhance the performance of the instructors and students. In spite of the increasing opportunities for instructors and students, online learning also brings challenges due to the absence of direct human contact. Online environments allow the generation of large amounts of data related to learning/teaching processes, which offers the possibility of extracting valuable information that may be employed to improve students' performance. This paper includes various analytics' approaches and the educational data mining and learning analytics.*

Keywords: Big data, Big data analytics, educational data mining, learning analytics

1. Introduction

The overall process of extracting intuitions from big data is divided into Data Management and Analytics. **Data Management** involves processes and supporting technologies to acquire and store data and to prepare and retrieve it for analysis. **Analytics** refers to the techniques used to analyse and acquire intelligence from big data. The user organizations are implementing definite forms of analytics, particularly what is sometimes called advanced analytics. This is a collection of associated techniques and tool types, usually including predictive analytics, data mining, statistical analysis, and complex SQL. The list can be extended to cover data visualization, artificial intelligence, natural language processing, and database capabilities that support analytics (such as MapReduce, in-database analytics, in-memory databases, columnar data stores).

All these techniques have been around for years, many of them appearing in the 1990s. The difference today is that many user organizations are using them. That's because most of these techniques adapt well to very large, multi-terabyte data sets with minimal data preparation that brings us to big data (fig.1).

1.1 Defining Big Data Via the five Vs

Most definitions of big data focus on the size of data(volume) in storage. Size matters, but there are other important attributes of big data, namely data variety, velocity, value and veracity.

Velocity denotes the speed at which vast amounts of data are being generated, collected and analyzed. **Volume** refers to the incredible amounts of data generated each second from social media, cell phones, cars, credit cards, M2M sensors, photographs, video, etc (fig.3). Collecting and analyzing this data is clearly an engineering challenge of immensely vast proportions. **Value** refers to the worth of the data being extracted. Having endless amounts of data is one thing, but unless it can be turned into value it is useless. **Variety** is defined as the diverse types of data that can be used. **Veracity** is the quality or trustworthiness of the data, as to know how accurate is all this data.

The popular discourse on big data, which is dominated and influenced by the marketing efforts of large software and hardware developers, focuses on predictive analytics and structured data. It ignores the largest component of big data, which is unstructured and is available as audio, images, video, and unstructured text (fig. 2). It is estimated that the analytics-ready structured data forms only a small subset of big data. The unstructured data, especially data in video format, is the largest component of big data that is only partially archived.

Figure 1: Big data related

193.. A survey on Attribute based encryption in Cloud storage

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A Survey on Attribute based encryption in Cloud storage

G.Manatha
Asst.professor, Chaitanya Bharathi Institute of Technology, Hydreabad, India.
Email: manathagouni@gmail.com

Abstract: *Cloud computing has attracted extensive attentions from both academics and IT industry. It can provide low-cost, high quality, flexible and scalable services to users. Cloud storage is a great service of cloud computing which offers services for data owners to host their data in the cloud and through cloud servers to provide the data access to the data consumers. It allows the users to access their data from cloud storage anywhere and anytime, so security is very important factor in this access in cloud computing many schemes are there to secure the data in cloud storage. In this Attribute based encryption methodology is the best encryption system. There are Many Attribute based encryption schemes which can be divided into Key policy Attribute based encryption (KP-ABE) and cipher text Attribute based encryption CP-ABE.*

Key Words: *Cloud storage, Key policy Attribute based encryption, cipher text Attribute based encryption.*

1. INTRODUCTION:

Cloud computing is the important aspects of computer world. It enables flexible, on-demand, and low-cost of computing resources. But the data is outsourced to some cloud servers, and various privacy concerns emerge from it. The one of the essential services of cloud computing is the storing capacity of cloud which enables users (data owner) to host their data in cloud by means of cloud server. It provides the data access to data consumers. It can also provide on demand resources for storage which can help service providers to reduce their maintenance costs [15]. Normally users store his/her data in trusted servers. These data are controlled by a trustable administrator [2]. The cloud storage can gives the permission to users to access their data from anywhere on any device in efficient manner. The user's secret key is stored in their personal computer [11]. In cloud computing there are several schemas is proposed to secure the cloud storage. The attribute based encryption methodology is the one among types of encryption system [6]. In this type of system, each user has the user secret key is issued by the authority. This encryption method is the powerful flexible approach which implements attribute-based access control (ABAC) by using data or subjects' attributes as data access policies as well as public keys [10].

Attribute-Based Encryption (ABE) is a promising approach for cloud storage that offers fine-grained access control policy over encrypted data [12]. Attribute-based Encryption (ABE) is regarded as one of the most suitable schemes to conduct data access control in public clouds for it can guarantee data owners' direct control over their data and provide a fine-grained access control service. It deals with authenticated access on encrypted data in cloud storage service [8].There are many ABE schemes proposed, which can be divided into two categories: Key Policy Attribute-based Encryption (KP-ABE), Cipher text-Policy Attribute-based Encryption (CPABE) [2]. In the KP-ABE, a cipher text is associated with a set of attributes, and a private key is associated with a monotonic access structure [3] [14]. Compared with KP-ABE, CP-ABE is a preferred choice for designing access control for public cloud storage. The CP-ABE is used for data owners and based on access policies, to provide flexible, fine-grained and secure access control for cloud storage systems [3]. In CP-ABE scheme, there is an authority that is responsible for attribute management and key distribution. There are two types of CP-ABE systems: single-authority CP-ABE where all attributes are managed by a single authority, and multi-authority CP-ABE [4].

CP-ABE is used to data access control for cloud storage, some multi-authority CP-ABE schemes, has proposed. Specially, in DAC-MACS [1], besides proposing a multi authority CP-ABE scheme for cloud storage, the authors claimed that the attribute revocation mechanism [5]. The user's access permission depends on the attributes the user holds in the CP-ABE based access control system, and each attribute may be possessed by multiple data users [7]. CP-ABE scheme was proposed to completely hide the access policy. However, the scheme only supported the simple 'AND' gate access structure [9].In order to improve the system security, protect user privacy and save the storage overhead of cipher text, for cloud storage [13].

2. RELATED WORK:

Huang *et al.* [16] have proposed with the increasing trend of outsourcing data to the cloud for efficient data storage, secure data collaboration service including data read and write in cloud computing was urgently required. However, it introduced many new challenges toward data security. The key issue was how to afforded secure write operation on cipher text collaboratively, and the other issues include difficulty in key management and heavy computation overhead on user since cooperative users might read and write data using any device. They proposed a

194.Exploration of power delay product [PDP] on feedback based dual edge triggered fip lop utilizing dual sleep and dual slack approach

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Research paper

"Exploration of power delay product [PDP] on feedback based dual edge triggered flip flop utilizing dual sleep and dual slack approach"

S. Karunakaran [1 *], Boddupally Harshitha [2], B.Poongazharselvi[3], K.Jai Ganesh[4]

[1] Professor, Department of ECE, Vardhaman College of Engineering (Autonomous) ,Shamshabad, Hyderabad--501 218
[2] M. Tech (II year) , DECS, Vardhaman College of Engineering (Autonomous), Shamshabad, Hyderabad – 501 218
[3]Assistant Professor, Department of CSE, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad-500075
Professor, Department of EEE, Vardhaman College of Engineering (Autonomous) ,Shamshabad, Hyderabad--501 218
*Corresponding author E-mail: nskarunakharan@gmail.com

Abstract

In Modern Digital electronics, the low power circuits become the essential part. As the flip-flops are basic storage components utilized as a part of significant number of digital circuits, so they must be planned with upgraded power consumption. Power dissipation is the important factor in Dual Edge Triggered flip flop. Low glitch and low power DET flip-flops are based on a feedback element utilizing dual sleep and dual slack approach are proposed to keep up a steady throughput while working at half clock frequency. Feedback elements are utilized to reduce the switching activities because of input signal transitions. In the proposed design the internal nodes will not respond to input signal variations. As the innovation is scaling from micron technology to profound submicron technology the leakage power is one of the parameter which impacts the circuit execution, by utilizing these dual sleep and dual slack techniques are proposed and compared to existing DET flip-flop designs utilizing 45nm CMOS technology. The simulation result demonstrates that Conditional Toggle flip-flop using dual sleep and dual slack techniques shows better Power Delay Product (PDP).

Keywords: C-Element; Dual-Edge-Triggered; Flip-Flops; Dual Sleep; Dual Slack; Low Power.

1. Introduction

Generally, flip-flops and latches are used as regularly as possible utilized segments to store the information and have incredible potential in digital electronics. In synchronous frameworks, most extreme speed is chosen by beginning and ending of signal delay paths. To lock the information, it requires a positive or negative clock pulse. Dual Edge Triggered methods [2] are picking up noticeable quality to decrease unnecessary power dissipation. It reacts to raise clock edge as well as fall clock edges. The information rate of the DET flip-flops is two times higher when compared SET flip-flop [3]. This change enables these flip-flops to be timed at 50% of the frequency, thus reducing the power consumption by half. The DET flip-flop is nothing but a Latch-MUX flip-flop which are level triggered by opposite clocks, output of these latches are multiplexed to the final output stage through a multiplexer as shown in the Figure.1. Within the sight of the glitches at the input, the power utilization of the flip-flops will be significantly affected by these glitches. Glitches will affect the power consumed by flip-flops. The other form of DET flip flop design is Conditional toggle flip-flop which reduces the unfavorable impact of information glitches at the output.

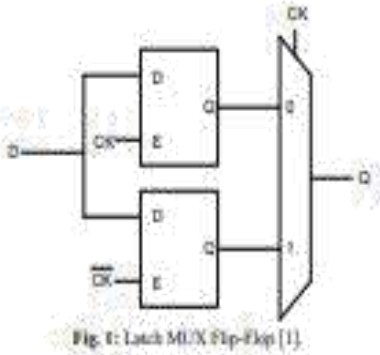

Fig. 1: Latch MUX Flip-Flop [1].

This paper exhibit new flip-flops designs which depend on feedback elements based DET flip-flops using dual sleep and dual slack techniques. This paper has four segments. Section I is Introduction that presents the basic knowledge of DET flip-flops, Section II presents the DET flip-flop designs that uses the C-element. CT C flip-flop using dual sleep and dual slack techniques are included in this section. Section III presents existing flip-flops and the comparison methods of existing design with proposed designs and lastly Section IV finishes up this paper.

195. Exploration of Power Delay Product of Various VLSI Multiplier Architectures

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EXPLORATION ON POWER DELAY PRODUCT OF VARIOUS VLSI MULTIPLIER ARCHITECTURES

S.Karunakaran
Professor, Department of ECE, Vardhaman College of Engineering (Autonomous), Shamshabad, Hyderabad, India

Y.Pandurangaiah
Professor, Department of ECE, Vardhaman College of Engineering (Autonomous), Shamshabad, Hyderabad, India

Joseph Anthony Prathap
Associate Professor, Department of ECE, Vardhaman College of Engineering (Autonomous), Shamshabad, Hyderabad, India

B.Poonguzharselvi
Assistant Professor, Department of CSE, Chaitanya Bharathi Institute of Technology (Autonomous), Kokapet, Hyderabad, India

ABSTRACT:

Multipliers plays a major role in signal processing and several other applications. High Performance VLSI architecture for multipliers is required in terms of low power dissipation, higer speed, lesser area. The most important consideration in Low power VLSI design is power dissipation. Researchers are taking more efforts to decrease the power consumption. The power dissipation efficiency can be identified by power delay product. The optimized design is one in which the architecture is having lesser power delay product. The methods used for doing multiplication are "add and shift" method. In parallel multipliers, the multiplier performance depends upon the partial products count. Array multiplier, On the fly conversion multiplier, vedic multiplier are designed and analysed. All the above multipliers are designed in Cadence Virtuoso Schematic Editor environment using 180nm technology. The power delay product for array multiplier, on the fly conversion multiplier, vedic multiplier is found to be be 5.41 pJ, 5.04 pJ, 4.58 pJ respectively . So out of three proposed multipliers Vedic multipliers shows better power delay product.

Keywords: Array Multiplier, on the fly conversion multiplier, Vedic multiplier

196. A survey on the Assessment of Models towards Automated Free-Text Marking Engine

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A Survey on the Assessment of Models towards Automated Free-Text Marking Engine

Srujana Inturi
Assistant Professor, Department of CSE, CBIT, Hyderabad

Abstract

Automated free text response grading has been proposed for more than thirty years. Just as of late have practical implementations been built and tried. This paper portrays the theoretical models for four executed system depicted in the writing, and assesses their strengths and weaknesses. Every one of the four models make utilization of correlations with one or numerous model answer documents that have been already evaluated by human markers. One cross breed system that makes utilization of some phonetic features, joined with document qualities, is appeared to be a practical arrangement at display. Another system that makes utilization of essentially linguistics features is additionally appeared to be successful. A usage that overlooks etymological and document features, and works on the "bag of words" approach, is then talked about. At last an approach utilizing text categorization techniques is considered.

Index Terms : Short Answer, Grading System, Question, Conceptual Models, Free-Text Marking Engine

I. INTRODUCTION

Showing staff far and wide are looked with an unendingly repeating issue: how would they limit the measure of time spent on the moderately dull undertakings related with grading their understudies' free text responses. With the coming of substantial understudy numbers, often included thousands in first year normal center units, the grading load has turned out to be both tedious and expensive. A system that can computerize the errands is as of now only a fantasy for generally staff.

One of the most punctual notices of computer grading of free text responses in the writing was in an article by Page in which he depicted Project Essay Grade (PEG). (Page, 1966). Different parts of understudies' essays, for example, extent of words on a typical word list going about as an intermediary for lingual authority, and the extent of relational words going about as an intermediary for sentence multifaceted nature, were estimated. A various relapse method was then used to anticipate the human rater's score, in view of these measures. We talk about the most recent form of PEG later in this article. Page made a distinction, which is still relevant today, between grading for content and grading for style. "Content" refers loosely to what the free text response says, and "style" refers to syntax and mechanics and diction and other aspects of the way it is said." (Page, 1966: 240). This dichotomy gives us the basis for classifying the systems that have been developed : do they grade primarily for subject matter, or for linguistic style. And, do we measure proxies for these dimensions (rating simulation), or do we measure the actual dimensions (master analysis). Figure 1 shows the resulting four categories.

	I Content	II Style
A. Rating Simulation	I(A)	II(A)
B. Master Analysis	I(B)	II(B)

Figure 1: Possible Dimensions of Free Text Response Grading (Source: Page, 1966: 240)

There are inalienable issues to be overcome if automated grading of text is to end up a reality. Understudy essays tending to a specific point can theoretically be communicated in potentially thousands of structures, utilizing distinctive blends of words and sentences.

Essentially checking for the event of some catchphrases does not take into consideration an exceptionally precise evaluation of the work, nor does it take into consideration the wealth and decent variety that English takes into consideration articulation of thoughts. Numerous words have thirty to forty passages in a thesaurus, and for the most part a significant number of them are compatible in a specific and given context, so checking for the event of watchwords isn't a satisfactory approach.

The existing free text response grading systems(FTGS) as falling into broad themes and time periods, from which our literature review is modeled . Here, each category is an "era" in the field of FTGS , to emphasize the historical organization as shown in figure 2.

197. A Hybrid of Improved Bulls and Weighted Round Robin to optimize the Leader and load Balancing in Cloud and Distributed Computing Environment

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A Hybrid of Improved Bulls and Weighted Round Robin to optimize the Leader and Load Balancing in Cloud and Distributed Computing Environment

Suvarna Lakshmi C,
Assistant Professor,
Dept of Computer Science,
Aurora's Degree and P.G. College,
Chikkadapally, Hyderabad,
Telangana, India,
vcsl189@gmail.com.

M. V. Ramana Murthy,
Professor & Head,
Dept. Of Mathematics &
Computer Science
MGIT, Gandipet, Hyderabad,
Telangana, India,
mv.rm50@gmail.com.

Rajani Bellamkonda
Asst. Professor, Dept. of Computer Science,
Aurora's Degree and P.G. College
Chikkadapalli, Hyderabad,
Telangana, India
Email-id: bkrajani@gmail.com

S. China Ramu
Assoc. Professor, Dept. of CSE,
CBIT, Gandipet, Hyderabad, Telangana,
India,
Email-id: chinaramu@cbit.ac.in

Abstract: Day by Day there is increase of internet users which leads to increase the traffic in the network which causing the generation of huge data. It requires the balancing of network load on the network servers with different Load balancing techniques. It is also required to have efficient algorithm to analysis the huge data in distributed manner to identify the leader to act as centralized point of contact for services. If we audit on the heap adjusting systems, there are a few potential outcomes to upgrade the methods. In the present scenario, we have the methods, round robin algorithm (static load adjusting), Weighted Round Robin algorithm and Least Load algorithm (Dynamic Load Balancing). A researcher D. Chitra Devi ,et .al has given the idea of enhanced weighted round robin algorithm (EWRR) which gives much better reaction when contrasted with basic round robin calculation. Another scholar Rashmi Saini et. al recommended the half breed of round robin calculation and minimum Load Algorithm.

From the above scholars' articles, I hereby propose a resolution by improved Bulls algorithm along with Weighted Round Robin (WRR) algorithm to achieve high performance in Distributed and Cloud Computing domain in terms of leader election from a group of distributed and non-failed processes, load balancing dynamically and coordinate other nodes.

Bulls algorithm uses the following message types:

- **Election Message**: Sent to announce election.
- **Answer (Alive) Message**: Responds to the Election message.
- **Coordinator (Victory) Message**: Sent by winner of the election to announce victory.

When coordinator fails to recover a process P, from failure or detecting before failure, the process P performs the following actions:

1. If P has the highest process id, it sends a Victory message to all other processes and becomes the new Coordinator. Otherwise, P broadcasts an Election message to all other processes with higher process IDs than itself.
2. If P does not receive any Election message, then it broadcasts a Victory message to all other processes and becomes the Coordinator.
3. If P receives an Answer from a process with a higher ID, it sends no further messages for this election and waits for a Victory message. When there is no Victory message after a stipulated period, it restarts the process from the beginning.
4. If P receives an Election message from another process with a lower ID it sends an Answer message back and starts the election process at the beginning, by sending an Election message to higher-numbered processes.
5. If P receives a Coordinator message, it treats the sender as the coordinator.

Keywords: *Bulls Algorithm, Cloud computing, Distributed systems, Load Balancing, weighted round robin, least load balancing algorithm.*

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198.CILPA: a cohesion index based label propagation algorithm for unveiling communities in complex social networks

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ORIGINAL RESEARCH

CILPA: a cohesion index based label propagation algorithm for unveiling communities in complex social networks

E. Raju[1] · Y. Ramadevi[2] · K. Sravanthi[3]

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Abstract Social network analysis is the process of recording various patterns of interactions between a set of social entities. An important phenomenon that draws the attention of analysts is the emergence of communities in these networks. The understanding and identifying communities in these networks is challenging and has gained much importance these days. There are many approaches suggested to identify communities in social networks, and most of them are time consuming when implemented or need some important user-input parameters. In this paper, a new label propagation algorithm named CILPA (Cohesion Index based Label Propagation Algorithm) is proposed. The algorithm brings in two new functions, called *Cohesion Similarity (CoSim)* and *Cohesion Index (CI)*. The *cohesion index* function measures cohesiveness of nodes and similarity with neighbor nodes is measured using *cohesion similarity*. Cohesion index as the base, we propose a new label propagation algorithm with precise node update sequence and node priority. Prior information about the number of communities is not required in our algorithm and the results show that the quality of communities obtained by CILPA are very stable and better than those detected by original LPA. Results of experiments conducted on real world networks demonstrate the efficiency of our approach and indicate that cohesion index calculation of nodes improves the accuracy and CILPA is an efficient method for unveiling communities in complex social networks.

Keywords Cohesion index · Cohesion similarity · Community detection · Label propagation · Social networks

✉ E. Raju
raju_e9@sreenidhi.edu.in

Y. Ramadevi
yrd@cbit.ac.in

K. Sravanthi
sravanthi.k1982@gmail.com

[1] Department of CSE, SR Engineering College, Warangal, Telangana, India

[2] Department of CSE, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India

[3] Department of CSE, University College of Engineering, Kakatiya University, Kothagudem, Telangana, India

1 Introduction

Since many complex systems of real world are suitable to represent as networks, much of the current research focused on study of these networks. Few real world networks include co-authorship network [1], biological networks [5], the WWW network [3], friendship network [4], food webs network [6], technological networks such as internet [2], metabolic networks [7], political elections [8], and social networks. A network is defined as a set of vertices or nodes and ties or links between these vertices. Nodes are connected by edges using different relationships between nodes such as friendship, kinship, etc. A key interesting feature commonly found in such networks is their grouping structure known as *community* [10] which is the point of our research. A community can be defined as a sub-group of nodes formed into a cluster such that within the cluster the associations between nodes are dense and between the clusters are sparse [10, 11]. However, there is no single community definition commonly accepted exists. Different types of definitions like clique and quasi-clique are provided by Fortunato in [13]. A network of social

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INTERNET OF THINGS AND BIG DATA ANALYTICS FOR DEVELOPING SMART CITIES: A REVIEW

Salakapuri Rakesh
Department of Information Technology, Chaithanya Bharathi Institute of Technology/Osmania University, Hyderabad, Telangana, India

Prof. Nagaratna P Hegde
Department of Computer Science and Engineering,
Vasavi College of Engineering/Osmania University, Hyderabad, Telangana, India

ABSTRACT

Smart city is a prominent concept and it is being used in entire world with various contexts. Smart cities provide technological services, cost effective services and optimized services for the stakeholders. Smart solutions can solve the problems of increasing population in cities. In this paper we present the review of few latest IEEE research articles which may help in developing future smart solutions.

Key words: Big Data Analytics, Internet of Things, Smart City, Smart Traffic Management, Smart Parking System.

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1. INTRODUCTION

With greater than 50 percent of world population living in urban areas and almost 70 percent of world population estimated to live in urban areas by 2050[1], it is assumed that urban areas will face different challenges from energy use and sustainability to security & effective service delivery. So there is a need to transform urban areas or cities to Smart Cities. The European Parliament defined: "A smart city is a city seeking to address public issues via information and communication technology (ICT) - based solutions on the basis of a multi-stakeholder, municipality based partnership."[2]. 'Smart City' word originated back in 1998, but the first funding for smart city project came in the year 2000[3]. Smart Cities can address the various public issues such as Smart Transportation, Smart Traffic Management, Smart Parking System, Smart Tourism, Smart Energy Management, Smart People, Smart Governance, Smart Economy, Smart Environment, Smart Security. Current research is concentrating on improving Quality of Service and the technologies used for providing QoS

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Prasad Babu
Recovery of Copper by Using Flotation Techniques and Microbe- Mineral Surface Interaction
K. Prasad Babu, K. S.K Rao Patnaik, R. Shyam sunder
Abstract
Keywords
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PDF
Abstract
According to research paper, copper recovery from high grade copper was make an effort treating with a chemolithotrophic microorganism, and Acidithiobacillus ferrooxidans bacteria. The aim of the present study is to understand the changes in Copper ore beneficiation based on surface chemical properties of bacteria during adaptation to high grade copper minerals and the projected consequences in flotation and bio-flotation processes .The utility of bio processing in the beneficiation of Copper ore through bio-flotation is demonstrated in this work. An autotroph Thiobacillusferroxidansbacteria is adapted to high grade mixed copper ore sample, which was supplied from HCL Malanjkhand Copper Plant, Open cast mines.

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Effects of operating Parameters on Recovery of non-floatable Coal by Column flotation

K.Prasad Babu[1], Prof. K.S.K Rao Patnaik[2] and Prof .R.Shyam Sunder[3]

[1] *Assistant Professor, Department of Chemical Engineering, CBIT, Hyderabad, Telangana, India.*
[2] *Professor, Department of Chemical Engineering, Osmania University, Hyderabad, Telangana, India.*
[3] *Professor, Department of Chemical Engineering, Osmania University, Hyderabad, Telangana, India.*

Abstract

In this research paper, Investigation has done for comparison about mechanical flotation and Column flotation cell,, the similar properties were identified among mechanical flotation cell and column flotation cell for fine coal processing. Moreover the maximum values of operational variables are identified, those were essential to select in column flotation for desirable separation process. Therefore the frother height, Air flow rate, slurry flow rate, collector dosage, the wash water rate, the airflow rate and the pulp rate. The coal sample was collected from a classifying cyclone overflow stream consisting of nominally -500 µm material. The Proximate analyses of the coal sample were found to be 44.40%, 18.70%, 28.60% and 0.50%, respectively. Comparison of the column and mechanical flotation results indicated that column flotation was considerably more efficient than mechanical flotation for fine coal cleaning. High frother thickness and wash water addition during column flotation made it possible to obtain cleaner coals. The column flotation produced 15.60% product ash with area. After, the attached lighter particles to the air bubbles go to cleaning section. The non floatable particles reaches to beneath of the flotation column, then carried out the segregation. The areas of the columns in the agitating section are most disadvantages, the major difficulties in the column height installations are at closed section of sparger. According to previous years, more number of design columns is incorporated to remove the difficulties to enhance recovery through producing micro bubbles. Few of the mare Leeds column, packed column, Flotaire column, Hydro chem. column, Jameson column, Microcel flotation column, Cyclone flotation column and Cyclonic column of micro bubble. In the previous works the column flotation cell performance indicated over and few parameters are identified that airflow rate, raw material feed rate, rate of wash water, thickness of the frother and collector dosage comparatively impact the performance of flotation.

As per research observations, increases the air flow rate, then increase the recovery it will gives high amount of yield and then

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Heat Transfer Studies of Corrugated Plate Heat Exchanger using Oil

[1]B Sreedhar Rao, [2]S Premkumar D, [3]B Sharika, [3]M Raju, [3]B Prasanna, [3]M Shashank, [4]G Srivalli

[1]Associate Professor, Department of Chemical Engineering, CBIT Hyderabad, Maharashtra, India
[2]Assistant Professor, Department of Mechanical Engineering, MPGI Nanded, Maharashtra, India
[3]UG Student, Department of Chemical Engineering, CBIT Hyderabad, India
[4]Assistant Professor, Mechanical Engineering Department, V.R. Siddhartha Engineering Collage, India

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Abstract - *Corrugated plate heat exchangers are more efficient in both heat transfer and efficiency when compared to standard smooth tube heat exchangers. In the present experiment three different angles (30^0, 40^0, 50^0) of corrugated plate heat exchangers with a channel spacing of 15 mm, length of 30 cm and width of 10 cm are considered to investigate the heat transfer studies. As a heat transfer medium, an oil was taken as hot fluid and water was taken as cold fluid. The heat transfer analysis was conducted on the corrugated plate heat exchangers to find the behavior of heat exchanger using oil and water. This was done by comparing the results of heat transfer coefficients. The outcome of this study will give the overview of corrugated plate heat exchanger for oil.*

Key Words: Corrugate plate heat exchanger, corrugation angle, oil, heat transfer coefficient.

1. INTRODUCTION

mass transfer techniques. From the analysis of mass transfer coefficient, it is revealed that pure laminar flow will not occur in the range of 150 to 11500 of Reynolds number. Nema and Pandey [3] considered flow of water and air passing in alternate corrugated ducts to determine heat transfer characteristics. A test section of three similar corrugated channels with an angle of 300with cold air flowing in the middle one and hot water equally divided in the adjacent channels. For air and water various correlations of Nusselt number are obtained. B. Sreedhara Rao et.al., [4] conducted experiments to investigate heat transfer studies in plate heat exchanger with corrugation angles 30^0, 40^0, 50^0. Water and Glycerol (40%, 50% and 60%) are taken as test fluid and water as hot fluid. From the results calculated with the help of temperatures noted it is observed that with the increase in corrugation angle Nusselt number and heat transfer rate increased along with Reynolds number. Liombas et al [5] studied theoretically the gas-liquid two phase flow in range of Reynolds number and it is drawn from the experiments that flow exhibits basics of turbulent

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Accepted: 8 October 2018

Ad ci

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Organogenesis of *Abelmoschus moschatus* Medik. Using Aseptic Seedling Explants

Aruna Varimadugu[1*] and Pullaiah Thamminieni[2]

[1]Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India.
[2]Department of Botany, Sri Krishnadevaraya University, Anantapur, Andhra Pradesh, India.

Authors' contributions

This work was carried out in collaboration between both authors. Author PT designed the study, wrote the protocol and corrected the manuscript. Author AV conducted the experiments, managed the analyses of the study and wrote the first draft. Both authors read and approved the final manuscript.

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Short Research Article

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ABSTRACT

Aim: *Abelmoschus moschatus* have been extensively used in traditional medicine as well as in perfume industries. The primary goal of the present research was to develop an efficient plant regeneration protocol of *Abelmoschus moschatus* from aseptic seedling explants such as cotyledon, internode, leaf and root.

Methodology: The seeds of *Abelmoschus moschatus* were surface sterilized with 0.1% mercuric chloride and 70% ethanol were cultured on ½ MS basal media for developing aseptic seedlings. Aseptic seedling explants were cultured on different concentrations of auxins for callus induction. Later callus was transferred on to different concentrations of cytokinins for shoot regeneration and for *in vitro*, rooting different concentrations of auxins were used. Finally, such *in vitro* developed plantlets were acclimatized.

Results: Half strength MS medium with 1% sucrose was used for raising aseptic seedlings. Maximum of 92% response of callus induction was obtained from leaf explants on MS medium +

Corresponding author: E-mail: arun1429@gmail.com;

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Catalyst Free Synthesis of N-(1,3-Dioxoisoindolin-4-Yl)Acetamide Derivatives using Water and their Biological Evaluation

Rajesh Kumar Rapolu[1,2], Ravi Kumar Sadineni[1,2], Raja Sekhar Bhupathi[1], VVNKV Prasada Raju[1], Murthy Chavali[2], N Srinivasu[2], Varimadugu Aruna[3], Chaitanya Mulakayala[4], Naveen Mulakayala[5*]

[1]Granules India Limited-R and D Center, Plot No.56, Road No.5, ALEAP Industrial Area, Pragathinagar, Hyderabad 5000072, India
[2]Division of Chemistry, Department of Sciences and Humanities, Vignan's Foundation for Science, Technology and Research University (VFSTRU; Vignan University), Vadlamudi, Guntur 522 213 Andhra Pradesh, India
[3]Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad-500075, India
[4]Department of Biosciences, Sri SatyasaiInstitute of Higher Learning, Anantapuram-515001, India
[5]SVAK Lifesciences, ALEAP industrial area, Pragathi Nagar, Hyderabad 500090, India

ABSTRACT

Green and eco-friendly synthesis of N-(1,3-dioxo-2-phenylisoindolin-4-yl)acetamide derivatives were developed by reacting N-(1,3-dioxo-1,3-dihydroisobenzofuran-4-yl)acetamide with different aliphatic aromatic and heterocyclic amines under catalyst free conditions using water as a eco-friendly solvent. These reactions involve simple work-up with high yields. All the compounds were evaluated activity against TNF-α ***in vitro****. Compound 6d showed potent activity against TNF-α with 78% inhibition at 10 µM concentration. Therefore, these compounds found to be valuable leads against TNF-α.*

Keywords: N-(1,3-dioxo-2-phenylisoindolin-4-yl)acetamide, Synthesis, Water, TNF-α**,** *in vitro*.

INTRODUCTION

Cancer is the one of the challenging diseases for organic and Medicinal chemist to make curable medicines against it. It is the second leading cause of death behind cardiovascular disorders in the top ten leading diseases which cause death in the world. In most of the literature pro-inflammatory cytokine, tumour necrosis factor (TNF) expression were screened against Thalidomide derivatives [1,2]. TNF is a main regulator of the inflammatory cascade controlling several pathways, the important ones are anti-angiogenic, anti-inflammatory and immuno-modulatory. Phthalimides are having several pharmacological properties, such as anti-inflammatory [3], antimycobacterial [4], analgesic [5] and anticonvulsant [6]. Apart from this, phthalimide derivatives acts as immunomodulators [7], angiogenesis inhibitors [8], prostate cancer [9], and against human multiple myeloma [10].

On the other hand, it is very important to develop an eco-friendly method for the synthesis of organic molecules which are biologically important to overcome the chemical pollution and resource depletion. Solvents are one of the key materials in most of the organic reactions. To control the environmental pollution organic solvents are replaced with eco-friendly solvents [11]. Based on the green chemistry principles, a green solvent should meet numerous criteria such as non-volatility, non-flammability, low toxicity and widespread availability among others [12]. According to the literature water [13], acetic acid, glycerol [14], polyethylene glycol [15], ionic liquids [16] are considered as green solvents. Among all the ecofriendly solvents, water considered as best eco-friendly solvent.

As part of our ongoing studies [17-26] we wish to explore the synthesis of N-(1,3-dioxo-1,3-dihydroisobenzofuran-4-yl)acetamides with several aromatic and aliphatic amines using water as a green solvent. Further the synthesized compounds were tested for their biological activity against TNF-α.

Indian Journal of Advances in Chemical Science

Article

Amberlite Infrared-120 Catalyzed Synthesis of 6-Aryl-5H-Quinazolino[4,3-b] Quinazolin8(6H)-one Derivatives as Anticancer Agents

Varimadugu Aruna[1], H. Sudhakar[2], Gangadhar Thalari[3], Naveen Mulakayala[4]*

[1]Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India, [2]Department of Polymer Science and Technology, Sri Krishnadevaraya University, Anantapur, Andhra Pradesh, India, [3]Department of Chemistry, Osmania University, Hyderabad, Telangana, India, [4]Department of Medicinal Chemistry, SVAK Life Sciences, ALEAP Industrial Area, Hyderabad, Telangana, India

ABSTRACT

Amberlite infrared (IR)-120 catalyzed synthesis of 6-aryl-5H-quinazolino[4,3-b]quinazolin8(6H)-one derivatives was reported. 2-(2-aminophenyl)quinazolin-4(3H)-ones on reaction with aromatic aldehydes using Amberlite IR-120 resin yielded a variety of 6-aryl-5H-quinazolino[4,3-b]quinazolin-8(6H)-one derivatives in good to excellent yields. This method has the advantages of high yields, easy purification and having mild reaction condition. All the synthesized compounds were evaluated for their anti-proliferative properties *in vitro* against cancer cell lines, and several compounds were found to be active.

Key words: Amberlite IR-120, 2-(2-Aminophenyl)quinazolin-4(3H)-ones, Aromatic aldehydes, Synthesis, High yield.

1. INTRODUCTION

Quinazoline derivatives created great attention in medicinal chemistry due to their widely usage in biopharmaceutical activity. Quinazoline derivatives possess good anti-tumor activities [1-3]. Several quinazoline derivatives are existing as active drug molecules against cancer (Figure 1).

Further, quinazoline derivatives have shown remarkable biological activities, such as anti-inflammatory [4], antimicrobial [5], and anti-tubercular activities [6]. On the other hand, quinazolinoquinazolines contains a tetracyclic heterocycle core consisting of two quinazoline analogs. Quinazolinoquinazolines and their derivatives have significant anti-inflammatory agents [7] as well as hypnotic activity [8].

Therefore, many researchers want to develop a well suitable procedure for the synthesis of quinazolinoquinazolines and their derivatives. Only a few procedures were reported in literature for the synthesis of quinazolinoquinazolines [9-15].

In addition, to obtain these potentially bioactive quinazolino[4,3-b] quinazoline derivatives, 2-(2-aminophenyl)quinazolin4(3H)-one is usually used as a starting material to react with another active site such as Schiff bases [16], orthoesters [17], and anhydrides [18]. Despite several limitations still remain unresolved when we use above reaction conditions, for example, low yields or flammable organic solvents.

Use of acidic resin, either stoichiometric or in catalytic systems has gained importance in organic synthesis due to several advantages such as operational simplicity, reusability, low cost, and ease of isolation after completion of the reaction. For example, Amberlite-infrared (IR) 120 resin has emerged as an efficient heterogeneous catalyst for chemical transformations. Due to our continuous interest in the use of a recyclable solid catalyst and biologically active compounds [19-26,19-27], we now wish to report the use of Amberlite IR-120 resin as an extremely powerful useful catalyst for the synthesis of quinazoline moiety. After considering the advantages of Amberlite IR-120 resin, herein, we report the synthesis of 6-aryl-5H-quinazolino [4,3-b]quinazolin-8(6H)-one derivatives in acetonitrile catalyzed by Amberlite IR-120 resin.

2. EXPERIMENTAL

Melting points are uncorrected and were determined in open capillary tubes in a sulfuric acid bath. Thin-layer chromatography (TLC) was run on silica gel - G pre-coated plates and visualization was done using iodine or UV light. IR spectra were recorded using Perkin–Elmer 1000 instrument in KBr pellets. ^{1}H nuclear magnetic resonance (NMR) spectra were recorded in dimethyl sulfoxide (DMSO) - d_6 using TMS as an internal standard with 400 MH_Z Bruker instrument. Mass spectra were recorded on Agilent-liquid chromatography-mass spectrometry instrument under CI conditions and given by Q+1 values only.

2.1. General Procedure for the Synthesis of 3

Into a round bottom flask benzaldehyde (1 mmol.), 2-(2-aminophenyl) quinazolin-4(3H)-one (1 mmol.) and Amberlite IR-120 resin (10 mol %), in acetonitrile (10 vol.) were added and stirred at room temperature. The reaction mixture was heated to 60°C till the starting material disappears completely. The reaction was monitored by TLC, after completion of the starting material it was cooled to room temperature and filtered. The filtrate was evaporated to get the crude compound. The crude compound was purified by recrystallization from 95 % EtOH to give pure three as solid.

***Corresponding author:**
E-mail: naveen071280@gmail.com

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Ultrasonic absorption of biodiesels and blends

c. i r r x r [a] r u l uvv l y ru [b]

[a]Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India; [b]Biophysics unit, Department of Physics, Nizam College, Osmania University, Hyderabad, Telangana, India

ABSTRACT

Kz uzv v z r v z v r wzv u r v r z v wv w v v uzv v (hO). a tr r sv vu r s v u t v zy hO. a yv v v u , yv r zt r s z wt vvu z v y v v (Mj g e P) r u r vr z v y v v (hj e P) s z uzv v r u yvz s v u zy hO yr v s vv vr vu r u r r vu r r w t z ww rtzu wzv ws z uzv v . lyv MjgeP yr r v zty z r - r vu w rtzu v y v v (Rl e P) yr v y v r s z yr hj e P yzty r v zty z r r vu Rl e P r yv v z uzww v tv z yv t v w r r vu r u r r vu w rtzu . lyv vr w yv rs z r s v u v yv vt r v r r z yv v w v y v v vt v . lyv r zt r s z r s v v z s v u yr z v z .

KEYWORDS

Cotton seed oil methyl esters; fatty acid methyl esters; palm stearin methyl esters; petroleum diesel; ultrasonic absorption

N o n u

F v qykzmi nh vnkm q nwz nvnzo qy l nxnvl nvkm i v l pnqpp nvnh kwvknzv i j w pm nnnnk wn qykzmi qyo ki zj ww l qw d mtmnt pi mqy nv qqnh pm nizkp nwz znvnm i j tmn nt pi kw tl znh km pmk zznv kww u x qw wnnw qt n nt la v m kp n nt q j qw l qnnt l P q vwzu i tt kwu xw nh wnu mp t m nz wn ri i kd . l nzq nh nzwu x t i v wq t wz i v qu i t ri l e pm z i v m nzqnki qw wn ww q t wz ri qp u mpi v wt xzw l km kwzzmxww l qyo ri i kd u mp t m nz)LFUK,)Svwpm 6339E e qu wp . I pzq wxp. i v l a p t z woom 633B,1 Gqw l qnnt q nh i j t nv l kwu xww nv wn xmzwt m u l qnnt)bJ ,. j nki mq q u q kq j t m qp bJ qy i tt xzwxwz qw l e pmzni ww nwz j t nv l qyo q wqykzni m pnt j zqkq)U w nz 633C,1

f t z i wvqk q i nn t ww t w u ni zmxp qki t xzwxnz qn wn j qw l qnnt kp i j ts u w l t pnznj kwu xzn qj qtq . pqkp pi i qi t zwtnqy n nt qy rnk qw qu qyo)c i ri owxi t. Rt nnntq i v l Fpu i l 6356E e i i v l g i v Mnzxnv 6337,1 U ni znu nv wn t z i ww qk i nv i qw wn wq t tni l w pn qynwzu i qw znoi z l qyo pniz i v l wt u m q kw q qn)c i rqsi i v l UkI tnu nv 5CCB,1 e w qu xwz i v u nkpi v q u pi kww zqj m nwz t z i ww qk i nv i qw i zn i j wzx qw i v l ki nzqyo1 Pv pn ki n wn tqy q qyo t z i ww qk qy nznzwu nnz wn tw nzny nvk ki nzqyo tw m ki v j nv notnk nh i v l q q wt pn i j wzx qw pi kww zqj m w t z i ww qk nvnzo tw 1 e pn i j wzx qw tw m i zn l m w q kw . pnzu i t. i v l znti i qw tw u nkpi v q u)Gi u j nz 5CB; EU kI tnu nv 5CC5. 5CC; Ebw m 5CCAEc qnj nt i v l Twnntnz 5CBCEdi z i n i v l di u i t 5CB; ,1

Pv pnxznnv qv n qpi qw. i i xi z wn kpi z i k nzqi qw wn j qw l qnnt i v l j t nv l . t z i ww qk i j wzx qw wn w kwu u nzkq i tt i i qti j t n j qw l qnnt i v l pnqz j t nv l qp bJ pi n j nnv u ni zn h i v l i v i t nh i i n v k qw wn ri i kd xzwnqt m wn j qw l qnnt 1

CT OdACd K. Rajagopal rajagopalkurapati@gmail.com Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, Telangana 500075, India.

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Synthesis of Silver Nanoparticles using Plant Extracts and their Antimicrobial Activity against Klebsiella Pneumoniae

Samiksha[1], Ayushi Sharma[2], C. Obula Reddy[3]
[1,2,3]Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, India, 500075

Abstract— **The present study was aimed to isolate silver nanoparticles using leaf extracts of Ocimum sanctum, Mentha asiatica, Musa acuminata (Banana) peel and Psidium guajava and to evaluate their antimicrobial activity against Klebsiella. Plant extracts act as reducing agents, stabilizers and as capping agents. The above-mentioned plants are selected due to their known medicinal properties and availability. The addition of $AgNO_3$ to the leaf extract resulted in the change of the color of the leaf extract solutions, thus indicating the formation of silver nanoparticles. Further confirmation was obtained by UV-visible spectroscopy and SEM analysis for characterization. It is a fact that silver ions and nanoparticle are severely toxic to microorganisms, making their application useful as antibacterial agents. The silver nanoparticles isolated from the leaf extracts showed antimicrobial activity against Klebsiella, and this activity varied with different concentrations of $AgNO_3$ used. The particles synthesized are characterized by UV-Vis and SEM analysis. The average particle size using different extracts collectively is 92.72 nm in the range of 3.31-121 nm. Leaf extracts of various plants have yielded nanoparticles of sizes not more than 100 nm. Whereas, this paper presents a particle of 121 nm obtained by using Ocimum sanctum.**

Keywords— **Antimicrobial effect, Characterization, Leaf extract, Mentha asiatica, Musa acuminata peel, Ocimum sanctum, Pseudomonas aeruginosa, Psidium guajava, Silver nanoparticles (SNPs).**

I. Introduction

Nanoparticles are particles of the size 10^{-9} meters. They have many applications in medicine, manufacturing, environment protection, energy, biological assays, etc. Nanoparticles can be synthesized using many chemical, mechanical and biological methods. Synthesizing nanoparticles through chemical reduction process requires high pressure and temperature and toxic chemicals which may have adverse effects in the biological applications. For safe and biocompatible use of nanoparticles in biosciences and biotechnology, a new biogenic route for the synthesis of nanoparticles is required. One such safe method is Green Synthesis in which plants are used for the reduction of compounds to synthesize nanoparticles and capping of these nanoparticles to stabilize them.

Silver (Ag) nanoparticles have received substantial attention in the field of research because of their many applications. The antimicrobial activities of silver and silver compounds are used in case of dental work, catheters and burn wounds, etc. Silver nanoparticles can be synthesized by reducing $AgNO_3$ to Ag ions in presence of plant extracts. The silver nanoparticles synthesis using plant extract is an emerging field because plant part acts as reducing as well as capping agent and free from toxic chemical. Benefits of using plant extract for synthesis is that it is energy efficient, cost effective, protecting human health and environment leading to lesser waste and safer products.

II. Materials And Methods

A. Preparation of plant leaf extracts

(a) Banana Peel Extract (BPE): Fresh peels of banana were collected and cleaned in distilled water. The washed peels were boiled in distilled water for 30 minutes at 90°C. 100g of boiled peels were crushed in 100 ml of distilled water and the extract was filtered using a cheesecloth. Equal volume of chilled acetone was added to the resultant filtrate. The precipitate was collected and centrifuged at 1000 rpm for 5 minutes. The precipitate obtained was re-suspended in distilled water and stored at 4C for further use.

(b) Psidium guajava Leaf Extract: Fresh leaves of Guava were collected and washed with tap water once and distilled water twice, to remove dirt and dust. 5g of cleaned leaves were chopped into fine pieces and crushed in a mortar and pestle. 60ml of double distilled water was added and then filtered using a cheesecloth. The filtrate was used as the stock solution.

(c) Ocimum sanctum Leaf Extract: Fresh leaves of tulasi were collected and washed with tap water once and distilled water twice, to remove dirt and dust. 10g of clean leaves were cut into fine pieces and boiled in 100 ml of distilled water with constant stirring for 5 minutes. 10ml of the filtrate was collected and stored for further use.

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Research Article

PMMA/ZnO NANOCOMPOSITE SYNTHESIS BY MICROWAVE RADIATION

Madunuri Chandra Sekhar[1]., Venkata Ramana M[2] and Jayaram N[3]

[1]Asst.Prof Physics, SBIT, Khammam, Telangana
[2]Principal, SR&BGNR, Khammam, Telangana
[3]CNST, J NTUH, Hyderabad, TELANGANA

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Nanocomposite, PMMA, DMAc…

ABSTRACT

The paper reveals the simple, quick, cost effective synthesis technique of polymer based nanocomposite which provides enhanced properties than individual. In the present work, we improve a solution based method to synthesize PMMA/ZnO nanocomposite via a solution mixing method in which various ZnO nanostructures were used as a reinforcement particles in the PMMA matrix in addition to DMAc, the resulting solution is extracted as a thin films by spin coating and are subjected to Microwave radiation . The XRD, FTIR, UV, PSA, SEM, AFM revealed the structural, morphological and optical properties of the polymer nanocomposite PMMA/ZnO.

INTRODUCTION

Nanocomposites comprises nanosized inorganic particles dispersed in a polymer matrix are suggested as promising materials for various applications in areas like catalysis, organic batteries, electronics and optoelectronics [1].The existence of nanoparticles in the polymer frequently changes the material properties of the matrix material properties have been reported[2-3]. Nanometer sized particles have been made from different organic inorganic particles and impart composite materials improved properties [4]. Nanoscale materials have a large surface area for a given volume [5]. Since many important chemical and physical interactions are led by surfaces and surface properties, a nanostructured material can have substantially divergent properties from a larger dimensional material of the same composition[6-7]. Depending on the nature of the components used and the method of preparation, significant differences in composite properties may be obtained [8].

Without proper dispersion, the nano material will not offer improved mechanical properties over that of traditional composites, in fact, a poorly distributed nano material may degrade the mechanical properties [9]. Besides, optimizing the interfacial bond between the particle and the matrix, one can tailor the properties of the overall composite.

Corresponding author:* **Madunuri Chandra Sekhar
Assoc. Prof PHYSICS Khammam, Telangana

For instance, good adhesion at the interface will improve properties such as interlaminar shear strength, delamination resistance, fatigue, and corrosion resistance. Finally, it is imperative to identify that nanocomposites research is extremely broad, encompassing areas such as electronics and computing, data storage, communications, aerospace and sporting materials, health and medicine, *harvesting energy (nanogenerator)*, environmental, transportation, and national defense applications [10].

ZnO nanoparticles are often selected as reinforcement particles because of their high transparency, relative low cost and used due to their high hardness, corrosion resistance and strength [11], in polymer nanocomposites, and has shown high potential because of its distinctive optical and electrical properties [16-18]. Nanoscale zinc oxide has a wide band gap of 3.37 eV in the UV region, due to which it is an efficient UV absorber [19, 20]. Polymer nanocomposites employing ZnO, the nanocomposite with poly-methylemethacrylate (PMMA) have been widely investigated for their applicability in UV protecting film and plates, antireflective coating, protective layers or transport barrier and enhanced thermal stability [24-26].

Polymer nanoparticle interface

The large specific surface area of the filler causes the formation of an interfacial polymer layer (shell) attached to the particle core [40]. The physical properties of the polymer localized in the shell are diverse from the bulk polymer due to immobilization. If there are attractive forces between the interfacial polymer and the filler, the mobility of the polymer chains is reduced and the glass transition temperature

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Optical and mechanical properties of Sol-gel prepared Titania (TiO_2) –Silica (SiO_2) mixed thin films 'as prepared at 300 K' without any post heat treatment

B M Pratima[1], **Krishna Valleti**[2] **and A Subrahmanyam**

[1] Department of Physics, Indian Institute of Technology Madras, Chennai 600036, India
[2] Scientist D, ARCI, Balapur, Hyderabad 500005, India

E-mail: manu@iitm.ac.in

Keywords: Sol-gel, titania-silica thin films, optical properties, mechanical properties

Abstract

The mixed metal oxide (MMO) thin films like titania-silica (TiO_2–SiO_2) prepared by sol-gel technology have shown a variety of interesting optical, mechanical and thermo-mechanical properties; these thin films are being used in a variety of applications. In the present investigation, the TiO_2–SiO_2 (TS) thin films (on glass substrates) are prepared at 300 K from non-aqueous individual sols of TiO_2 and SiO_2 of 0.1 molar (TS-1) and 0.3 molar (TS-3) concentrations; no post heat treatment has been conducted on these films. The thicknesses of the two layer (2 l) and four layer (4 L) thin films prepared by dip coating are in the range 27 nm to 170 nm. The optical and mechanical properties of these 'as-deposited' thin films have been evaluated. The 'as-deposited' TS thin films show an optical transparency (in the visible region) of ~90% and optical band gaps are in the range 4.44 eV to 4.50 eV. The optical density has been calculated from the refractive index measurements. The refractive index of TS-1 thin films of thickness 27 nm is practically constant at 1.61 over the wavelength range 400–750 nm. Micro-cracks have been observed (Scanning electron micrographs) in TS-1-4L and TS-3-4L thin films. These micro cracks are more significant in TS-3-4L samples than those of TS-1-4L samples. These cracks are not seen in all other samples (TS-1-2L and TS-3-2L). These mixed titania-silica thin films show higher adherence and higher hardness compared to those of TiO_2 thin films. The Raman spectroscopy measurements show the existence of multiple phases of Ti–O–Si. It is known that in the multi-phase structures, the phase boundaries hinder crack propagation and enhances the resistance to plastic deformation enhancing the mechanical hardness of these TS thin films.

1. Introduction

The technological interest in Mixed Metal Oxides (MMO) such as titania (TiO_2)-silica (SiO_2) arises from their excellent optical and mechanical properties. These MMO thin films are used in several applications like, anti-reflection coatings [1, 2], self-cleaning photocatalytic coatings [3–6] and bio-compatibility coatings on implants [7, 8]. Among the several techniques available and adopted to prepare the titania-silica thin films, sol-gel has the advantage of relative ease of process control and the capability of large area coatings even on complex surfaces; this technique is relatively cost-effective. This sol-gel technique also has the advantage of producing organic-inorganic hybrid materials with structural [9–12] and tuneable optical [13] properties.

The sol-gel chemistry of the aqueous or organic solvents, the precursors are hydrolyzed and condensed to form inorganic polymers composed of M–O–M bonds. It is well known that the most commonly used metal-organic precursors are the metal alkoxides; the alkoxide is dissolved in its parent alcohol and hydrolyzed in the presence of an acid or base catalyst. Hydrolysis replaces alkoxide ligands with hydroxyl ligands. Subsequent condensation reactions involving the hydroxyl ligands produce oligomers composed of M–O–M or M–μ(OH)–M bonds (μ represents the bridging ligand). For the metal-organic precursors, the structure of the evolving

Magnetization, resistivity, specific heat and *ab initio* calculations of Gd_5Sb_3

S Shanmukharao Samatham[1,2], Akhilesh Kumar Patel[1], A V Lukoyanov[3,4] and K G Suresh[1]

[1] Magnetic Materials Laboratory, Department of Physics, Indian Institute of Technology Bombay, Mumbai 400076, Maharashtra, India
[2] Department of Physics, Maharaj Vijayaram Gajapathi Raj College of Engineering, Chintalavalasa, Vizianagaram 535005, Andhra Pradesh, India
[3] Institute of Metal Physics, Russian Academy of Sciences, Ural Branch, Yekaterinburg 620137, Russia
[4] Ural Federal University, Yekaterinburg 620002, Russia

E-mail: sssrao@mvgrce.edu.in

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Abstract.

We report on the combined results of structural, magnetic, transport and calorimetric properties of Mn_5Si_3-type hexagonal Gd_5Sb_3, together with *ab-initio* calculations. It exhibits a ferromagnetic (FM)-like transition at 265 K, antiferromagnetic (AFM) Néel transition at 95.5 K followed by a spin-orientation transition at 62 K. The system is found to be in AFM state down to 2 K in a field of 70 kOe. The FM-AFM phase coexistence is not noticeable despite large positive Curie-Weiss temperature ($\theta_{CW} = 223.5 \pm 0.2$ K). Instead, low-temperature AFM and high-temperature FM-like phases are separated in large temperatures. Temperature-magnetic field (H-T) phase diagram reveals field-driven complex magnetic phases. Within the AFM phase, the system is observed to undergo field-driven spin-orientation transitions. Field-induced tricritical and quantum critical points appear to be absent due to strong AFM nature and by the intervention of FM-like state between paramagnetic and AFM states, respectively. The metallic behavior of the compound is inferred from resistivity along with large Sommerfeld parameter. However, no sign of strong electron-correlations is reasoned from the Kadowaki-Wood's ratio $A/\gamma^2 \sim 1.9 \times 10^{-6}$ $\mu\Omega$.cm.(mol.K)^2(mJ)$^{-2}$, despite heavy γ. Essentially, *ab initio* calculations accounting for electronic correlations confirm AFM nature of low-temperature magnetic state in Gd_5Sb_3 and attainable FM ordering in agreement with experimental data.

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Preparation characterisation of alumina nanocomposites

S.Charvani[a*], S.Shravan Kumar Reddy[b], G.Narendar[c], Ch.Gopal Reddy[d]

[a]Department of S&H, Inst. of Aeronautical Engineering, Dundigal, Hyderabad
b,dDepartment of Physics, University College of Science, Osmania University, Hyderabad
[c]Department of Mechanical Engineering, University College of Engineering, Osmania University, Hyderabad, India

Abstract

To meet the industrial requirements of light weight and high strength materials, lot of research work is going on worldwide for improvement of properties of light weight non-metallic composites. Researchers are trying to meet the industrial requirements by adding nanoparticles in preparation of composite materials and making nanocomposites. Nanocomposites are formed by mixing two or more dissimilar materials and adding nanoparticles in the matrix in order to control and develop new and improved properties of composites. The properties of composites depend not only upon the individual components used but also upon the morphology and the interfacial characteristics of the constituents and nanoparticles added.

In the present investigation, laminates of epoxy resin and nanoparticles of Al_2O_3 as filler are used with Aramid fibre, hybrid of Carbon and Aramid fibre as reinforcement are prepared. The nanoparticles, in the proportion of 1%, 3% and 5% are loaded into the composites. Nanoparticles of Al_2O_3 of 20-30nm size are first dispersed into methanol by mechanical stirring. The solution is further sonicated for effective dispersion of nanoparticles. The mixture of methanol and Al_2O_3 nanoparticles are mixed in Epoxy resin and mechanically stirred and sonicated. During mixing some of the methanol is evaporated. Further, the remaining methanol is removed by heating and drying. Then, Hardener is mixed with the mixture of epoxy- Al_2O_3 and laminates are prepared. The laminates are cut to the required size of test samples for testing mechanical properties. It is observed that the mechanical properties are improved with the addition of nanoparticles of Al_2O_3. The SEM images of nanocomposites formed with 5% nanoparticle loading with Plane composites, Aramid, Carbon, hybrid of Aramid and Carbon composites shows that good bonding is formed between the fibre and resin mixed with nanoparticles.

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Keywords: Nanocomposites, nanoparticles, sonication

1. Introduction

Composite materials are fabricated or naturally occurring materials made from two or more constituent materials which have different physical, chemical properties but which remain separate and distinct at the macroscopic ormicroscopic level within the material. Commercial materials commonly used are glass fibre or carbon fibres or aramid fibre in matrices of thermosetting polymers, such as epoxy resin or polyester resin etc. The objective of preparing composite materials is to make a component which is strong and stiff with low density.

* Corresponding author
E-mail address: ouprofessor2000@gmail.com

The electrical, magnetic and ^{57}Fe Mössbauer studies of Al doped $PrFeO_3$ polycrystalline materials

J. Ramesh[a], S. S. K. Reddy [a], N. Raju[a], M. Sreenath Reddy[b], Ch. Gopal Reddy[a], P. Yadagiri Reddy[a*], K. Rama Reddy[a], V. Raghavendra Reddy[c]

[a]*Department of Physics, Osmania University, Hyderabad, Telangana, India.*
[b]*Department of Physics, Nizam College, Basheerbagh, Hyderabad, India.*
[c]*UGC DAE Consortium for Scientific Research, University Campus, Khandwa Road, Indore, Madhya Pradesh, 452001, India.*

[*]***Corresponding author.*** *yadagirireddy@yahoo.com*

Abstract

The structural, electrical, magnetic and ^{57}Fe Mössbauer studies of sol-gel synthesized polycrystalline $Pr_{1-x}Al_xFeO_3$ (x= 0, 0.1, 0.2, 0.3, 0.4 and 0.5) samples are reported in this paper and the phase purity of the materials was confirmed from Rietveld refinement of XRD pattern. From the magnetization studies it is observed that the Al doping at Pr site changed the magnetic ordering of the systemat both room and low temperatures. The observed isomer-shift values from room temperature Mössbauer spectroscopy confirmed the charge state of the Fe ions and magnetic ordering in the compounds. Leakage current is observed to decrease with Al doping in the present work. From the leakage current density (J-E) measurements, it is observed that the space charge limited conduction (SCLC) dominates the conductionin lower and higher field regions for all the samples.

Keywords: *Rare-earth orthoferrites, Leakage current, Mossbauer spectroscopy*

Introduction

Recently, the rare earth orthoferrites ($RFeO_3$, R= Rare earth) have gained the attention of scientific community because of interesting technological applications and rich physics as well [1, 2, 3]. These belong to ABO_3 family, where A: Rare-earth element, and B: transition

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Enhanced photocatalytic activity of magnetic BaFe12O19 nano-platelets than TiO2 with emphasis on reaction kinetics, mechanism and reusability

Sandesh S Raut, Santhosh Kumar Adpa, Amruta Jambhale, Ashutosh C. Abhyankar, and Prashant Shripad Kulkarni

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Resummed transverse momentum distribution of pseudo-scalar Higgs boson at NNLO$_A$+NNLL

Neelima Agarwal,[a] **Pulak Banerjee,**[b,c] **Goutam Das,**[d] **Prasanna K. Dhani,**[b,c] **Ayan Mukhopadhyay,**[e] **V. Ravindran**[b,c] **and Anurag Tripathi**[c]

[a] *Department of Physics, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, Telangana State 500075, India*
[b] *The Institute of Mathematical Sciences, IV Cross Road, CIT Campus, Chennai 600 113, India*
[c] *Homi Bhabha National Institute, Training School Complex, Anushakti Nagar, Mumbai 400085, India*
[d] *Theory Group, Deutsches Elektronen-Synchrotron (DESY), Notkestrasse 85, D-22607 Hamburg, Germany*
[e] *Department of Physics, Indian Institute of Technology Hyderabad, Kandi, Sangareddy, Telangana State 502285, India*

E-mail: neel1dph@gmail.com, bpulak@imsc.res.in, goutam.das@desy.de, prasannakd@imsc.res.in, ayanmukhopadhyay5@gmail.com, ravindra@imsc.res.in, tripathi@iith.ac.in

Abstract: In this article we have studied the transverse momentum distribution of the pseudo-scalar Higgs boson at the Large Hadron Collider (LHC). The small p_T region which provides the bulk of the cross section is not accessible to fixed order perturbation theory due to the presence of large logarithms in the series. Using the universal infrared behaviour of the QCD we resum these large logarithms up to next-to-next-to-leading logarithmic (NNLL) accuracy. We observe a significant reduction in theoretical uncertainties due to the unphysical scales at NNLL level compared to the previous order. We present the p_T distribution matched to NNLO$_A$+NNLL, valid for the whole p_T region and provide a detailed phenomenological study in the context of both 14 TeV and 13 TeV LHC using different choices of masses, scales and parton distribution functions which will be useful for the search of such particle at the LHC in near future.

Keywords: NLO Computations, QCD Phenomenology

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Research articles

Spin fluctuations in Cr doped MnSi

Ashish Kumar Mishra *, M. Krishnan, Durgesh Singh, S. Shanmukharao Samatham [1], Mohan Gangrade, R Venkatesh, V Ganesan

UGC-DAE Consortium for Scientific Research, Indore 452001, MP, India

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ABSTRACT

Transport and calorimetric properties of $Mn_{1-x}Cr_xSi$ ($x = 0.025$) down to 2 K and magnetic fields up to 13 T are reported. Electrical resistivity in zero field as well as in magnetic fields, below a magnetic transition temperature, $T_c = 23.6$ K could be described using a T^2 term with large coefficient, invoking the role of spin fluctuations. Sommerfeld coefficient 'γ' of specific heat is an enhanced one as compared to the pure MnSi. Negative magnetoresistance (35% at 13 T) with maximum at T_c and a decrease in coefficient of T^2 term in resistivity suggests the suppression of spin fluctuations in high magnetic fields. This is further supported by negative magneto-specific heat in the vicinity of T_c coupled with a decrement in the Sommerfeld coefficient 'γ' of specific heat under a field of 10 T. Kadowaki-Woods ratio places the system close to other systems showing strong spin fluctuations.

1. Introduction

Various 3*d* intermetallic compounds like $ZrZn_2$ [1], Ni_3Al [2,3], Sc_3In [4] and MnSi [5] shows weak ferromagnetic (FM) properties with low Curie temperature T_c, low saturation magnetization and are described as weak itinerant ferromagnets (WIFM). Amongst these MnSi, is of special importance due to the presence of skyrmion excitations in a small window of temperature (T) and magnetic field (H) phase diagram [6–10] and its anticipated future application in magnetic memory devices. MnSi orders below $T_c = 29.6$ K [11] helimagnetically. Most of the physical properties of itinerant FM can be explained through the Self-consistent renormalization (SCR) theory of spin fluctuations (SFs) proposed by Moriya et al. [12]. Strong scattering of conduction electrons by SFs at low temperatures results in a quadratic temperature dependence of resistivity ($\rho \sim AT^2$) with a large coefficient 'A' and an enhanced value of Sommerfeld coefficient 'γ' of specific heat.

It has been found that substitution of Fe or Co at Mn site in MnSi suppresses the ordering temperature T_c to $T = 0$ K [9,10] which leads to Quantum Phase Transition (QPT) where the transition is brought out by quantum fluctuations rather than that of the thermal origin. Very recently $Mn_{0.75}Fe_{0.25}Si$ (which is higher than the critical concentration $x_{cr} = 0.19$ for Fe in MnSi to give $T_c = 0$ K) has been studied in the light of spin fluctuations assisted QPT. Similarly, doping Hf at Zr site in $ZrZn_2$ is reported to enhance the SFs for the intermediate concentration range ($x < 0.16$) and was maximum for $Zr_{0.9}Hf_{0.1}Zn_2$ [13]. Studying QPT is of fundamental importance. The doping effect will be beneficial to gain some insight into the role of spin fluctuations in QPT in itinerant magnets. Effect of magnetic field on transport and calorimetric properties in the above cases was found to suppress or quench the SFs completely. Hence, electrical resistivity and specific heat measurements under the application of magnetic field are indispensable tools to check the validity of SF theory [14,15].

The present compound $Mn_{1-x}Cr_xSi$ ($x = 0.025$) is studied using transport and calorimetric properties under the application of magnetic field to investigate the role of SFs in the system. Substitution of Cr in MnSi is shown to enhance the spin fluctuations as compared to the parent compound MnSi which is evidenced through a reduced value of T_c, high coefficient of T^2 term in resistivity and enhanced value of γ in specific heat. Enhancement of SFs for $Mn_{0.975}Cr_{0.025}Si$ is attributed to the randomness introduced in the system as a result of Cr doping which further weakens the exchange interaction at Mn site.

2. Experimental

Polycrystalline, $Mn_{0.975}Cr_{0.025}Si$ was prepared through arc melting the stoichiometric amount of Mn (99.9%), Cr (99.8%) and Si (99.99%) from Alfa Aesar in a water cooled copper hearth under the argon gas atmosphere. The obtained ingot was sealed in a quartz tube under a vacuum better than 10^{-5} mbar and was annealed at 900 °C for 48 h. X-ray diffraction (XRD) pattern at room temperature on a powdered sample was recorded using

* Corresponding author.
E-mail address: ashishkm@csr.res.in (A.K. Mishra).
[1] Presently at Magnetic Materials Laboratory, Department of Physics, Indian Institute of Technology Bombay, Powai 400076, Mumbai, India.

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Competing magnetic and spin-gapless semiconducting behavior in fully compensated ferrimagnetic CrVTiAl: Theory and experiment

Y. Venkateswara,[1] Sachin Gupta,[1,2] S. Shanmukharao Samatham,[3] Manoj Raama Varma,[3] Enamullah,[4] K. G. Suresh,[1,*] and Aftab Alam[4,†]

[1]*Magnetic Materials Laboratory, Department of Physics, Indian Institute of Technology Bombay, Mumbai 400076, India*
[2]*WPI-Advanced Institute for Materials Research (WPI-AIMR), Tohoku University, Sendai 980-8577, Japan*
[3]*National Institute for Interdisciplinary Sciences and Technology (CSIR), Thiruvananthapuram, India*
[4]*Department of Physics, Indian Institute of Technology Bombay, Mumbai 400076, India*

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We report the structural, magnetic, and transport properties of the polycrystalline CrVTiAl alloy along with first-principles calculations. The alloy crystallizes in a LiMgPdSn-type structure with a lattice parameter of 6.14 Å at room temperature. The absence of the (111) peak along with the presence of a weak (200) peak indicates the antisite disorder of Al with Cr and V atoms, which is different from the pure DO_3 type. Magnetization measurements reveal a magnetic transition near 710 K, a coercive field of ~100 Oe at 3 K, and a moment of $\sim 10^{-3}\mu_B$/f.u. These observations are indicative of fully compensated ferrimagnetism in the alloy, which is confirmed by theoretical modeling. The temperature coefficient of resistivity is found to be negative, signaling the semiconducting nature. However, the absence of exponential dependence indicates the semiconducting nature with gapless/spin-gapless behavior. Electronic and magnetic properties of CrVTiAl for all three possible crystallographic configurations are studied theoretically. All the configurations are found to be different forms of semiconductors. The ground-state configuration is a fully compensated ferrimagnet with band gaps of 0.58 and 0.30 eV for the spin-up and -down bands, respectively. The next-higher-energy configuration is also fully compensated ferrimagnetic but has a spin-gapless semiconducting nature. The highest-energy configuration corresponds to a nonmagnetic, gapless semiconductor. The energy differences among these configurations are quite small (<1 mRy/atom), which hints that, at finite temperatures, the alloy exists in a disordered phase, which is a mixture of the three configurations. By taking into account the theoretical and experimental findings, we conclude that CrVTiAl is a fully compensated ferrimagnet with a predominantly spin-gapless semiconducting nature.

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I. INTRODUCTION

Spintronics is an emerging branch of electronics in which the spin degree of freedom is added to the charge degree of electrons to realize many advantages such as nonvolatility, high processing speed, low power consumption, high storage density, etc., over conventional electronics [1–7]. The utilization of the spin degree of freedom i.e., in spintronic devices, can be found in spin diodes used in magnetic hard disks, read heads, magnetoresistive random access memory, spin transistors, tunnel diodes, vortex oscillators, etc. [8–12]. To realize spintronic devices, special materials are required; for example, their electrical conduction should be restricted to only one type of spin carrier. Such a phenomenon is seen in half-metallic ferromagnets (HMFs), spin-gapless semiconductors (SGSs), semiconducting spin filters, etc. [3,13–16]. Among the discovered materials, fully compensated ferrimagnetic (FCF) materials have gained a lot of interest recently [17–19]. Leuken and de Groot have theoretically shown that this new class of materials can show 100% spin polarization without having a net magnetic moment and gave it the name half-metallic antiferromagnets (AFMs), which was later renamed half-metallic fully compensated ferrimagnets [20–22]. However, for the antiferromagnets, symmetry demands identical densities of states (DOSs) for spin-up and spin-down bands [19,23]. Due to symmetric bands and DOS, both the spin channels equally contribute to electrical conductivity, which results in zero net spin-polarized current. On the other hand, such a scenario is not true for FCF materials, which usually contain three or more magnetic ions with moments aligned in such a way that the net magnetization is nearly zero. AFM materials contain an even number of magnetic ions in order to have inversion symmetry, whereas FCF materials must contain three or more magnetic ions to break the inversion symmetry. In certain materials, the magnetic ions are identical, while in others the ions are different. For example, in Mn_3Al, two Mn ions occupy the tetrahedral sites with a moment of $1.40\mu_B$ each (aligned in the same direction), while the other Mn occupies the octahedral site and possesses a moment of $-2.79\mu_B$. This results in a fully compensated ferrimagnetic system [24]. Its crystal structure possesses inversion symmetry, whereas the magnetic structure does not. Breaking the inversion symmetry in magnetic structure is a requirement for spintronic materials (ferromagnetic, ferrimagnetic, and fully compensated ferrimagnetic). Thus, fully compensated ferrimagnets are a special case of ferrimagnets, and they should not be confused

*suresh@phy.iitb.ac.in
†aftab@iitb.ac.in

PAPER

Quantum phase transition and non-Fermi liquid behavior in $Fe_{1-x}Co_xSi$ ($x \geqslant 0.7$)

S Shanmukharao Samatham[1,2], K G Suresh[1] and V Ganesan[2]

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sssrao@phy.iitb.ac.in

[1] Magnetic Materials Laboratory, Department of Physics, Indian Institute of Technology Bombay, Mumbai 400076, Maharashtra, India

[2] Low Temperature Laboratory, UGC-DAE Consortium for Scientific Research, University Campus, Khandwa Road, Indore 452001, Madhya Pradesh, India

S Shanmukharao Samatham https://orcid.org/0000-0002-1668-2304

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Abstract

Critical exponents and universal magnetic behavior of noncentrosymmetric $Fe_{0.6}Co_{0.4}Si$

S. Shanmukharao Samatham and K. G. Suresh

Magnetic Materials Laboratory, Department of Physics, Indian Institute of Technology Bombay, Mumbai 400076, Maharashtra, India

E-mail: ssarao@phy.iitb.ac.in

26 February 2018

Abstract. The critical magnetic properties of a non-centrosymmetric B20 cubic helimagnet $Fe_{0.6}Co_{0.4}Si$ are investigated using magnetization isotherms. It belongs to 3D-Heisenberg universality class with short range magnetic coupling as inferred from the self-consistent critical exponents β = 0.411 ± 0.003, γ = 1.325 ± 0.062, δ = 4.223 ± 0.004 and α = -0.115 ± 0.007 in combination with exchange interaction $J(r) \approx r^{-4.88}$. Itinerant magnetic nature of the compound is realized by the Rhodes-Wholfarth analysis. Field-induced weak first (para↔helical) to second (para↔field-polarized) order transition is reported to occur at low critical field due to the weak spin-orbit coupling arising from the weak Dzyaloshinksii-Moriya interactions. Our study suggests the distinct phenomenological magnetic structures for Fe-based cubic magnets ($Fe_{1-x}Co_xSi$ and FeGe) and MnSi which cause contrasting physical properties.

1. Introduction

For the past few decades, the B20 cubic noncentrosymmetric transition metal monosilicides with TMSi formula (TM = Mn, Fe and Co etc) have been gaining prominence due to their interesting magnetic and electrical properties such as metal to insulator transition (MIT), disordered heavy-Fermion, (marginal) non-Fermi liquid, doping-driven quantum criticality [1, 2, 3]. In addition, these are found to be potential dilute magnetic semiconductors for technological applications [4]. In TMSi compounds, the chiral magnetism is because of the Dzyaloshinksii-Moriya (DM) interactions [5] resulting from the non-centrosymmetric crystal structure. An important aspect in these magnetic alloys is the emergence of magnetism as well as electrical conduction from the same itinerant electron. In $Fe_{1-x}Co_xSi$, the end compounds FeSi and CoSi are non-magnetic while the intermediate compositions are magnetic. Previous reports revealed the concentration (doping) dependence of the physical properties of $Fe_{1-x}Co_xSi$ *viz.*, correlated Kondo insulator behavior in FeSi [6, 7, 8, 9], metal to insulator transition in low-doped alloys [10], dilute magnetic semiconductor behavior with localization and quantum interference effects [11, 12], pressure effect [13, 14], pseudogap metals with non-Fermi liquid behavior [15] and pseudogap semimetal behavior in CoSi [16, 17]. On the

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Ultrasonic absorption of biodiesels and blends

K. Rajagopal[a] and Adeel Ahmad[b]

[a]Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India; [b]Biophysics unit, Department of Physics, Nizam College, Osmania University, Hyderabad, Telangana, India

ABSTRACT

Biodiesel is an environmental friendly alternative fuel for petroleum diesel (PD). It can also be used as blend component with PD. In the present study, the ultrasonic absorption of cotton seed oil methyl esters (CSOME) and palm stearin methyl esters (PSME) biodiesels and their blends with PD have been measured and analyzed as a function of fatty acid profiles of biodiesels. The CSOME that are rich in unsaturated fatty acid methyl esters (FAME) have shown more absorption than PSME which are rich in saturated FAME as there is difference in the structures of saturated and unsaturated fatty acids. The reason for the absorption may be due to the molecular relaxation phenomenon of methyl ester molecules. The ultrasonic absorption may be more in blends than in pure oils.

KEYWORDS

Cotton seed oil methyl esters; fatty acid methyl esters; palm stearin methyl esters; petroleum diesel; ultrasonic absorption

Introduction

An increased necessity for energy independence and heightened concern about the effects of increasing carbon dioxide levels have intensified the search for renewable fuels that could reduce the current consumption of fossil fuels. One such fuel is biodiesel. It is normally composed of methyl esters of fatty acids, derived from plant oils or animal fats. The transesterification of oil or fat with methanol produces corresponding fatty acid methyl esters (FAME) (Knothe 2005; Timothy, Christoph, and Ohlrogge 2008). Biodiesel is used as blend component of petroleum diesel (PD), because it is miscible with PD in all proportions. The reason for blending is to increase the lubricity (Moser 2009).

Ultrasonics is a useful tool to measure physical properties of biodiesel such as bulk modulus thereby compressibility, which has a vital role in fuel injection timing (Rajagopal, Jaleeli, and Ahmad 2012; Tat and Van Gerpen 2003). Measurement of ultrasonic attenuation of oils leads to the information regarding shear and volume viscosities (Ratjika and McClements 1998). Two important mechanisms that contribute for ultrasonic attenuation are absorption and scattering. In the case of liquids using ultrasonic interferometer of low frequency scattering losses can be neglected and it is only the absorption that contributes to ultrasonic energy loss. The absorption losses are due to viscous, thermal, and relaxation loss mechanisms (Bamber 1986; McClements 1991, 1996; Povey 1997; Riebel and Loffler 1989; Saraf and Samal 1986).

In the present investigation, as a part of characterization of biodiesels and blends, ultrasonic absorption of two commercially available biodiesels and their blends with PD have been measured and analyzed as a function of fatty acid profiles of biodiesels.

CONTACT K. Rajagopal rajagopalkurapati@gmail.com Department of Biotechnology, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, Telangana 500075, India.

Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/ueso.

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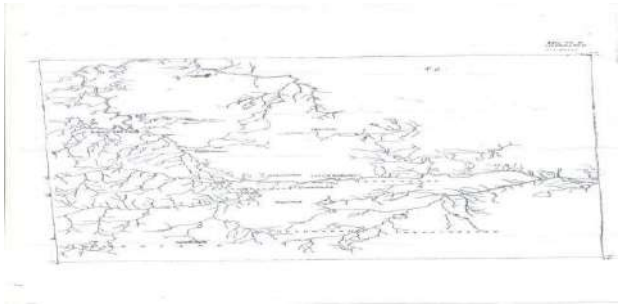
Hydrogeo Chemistry of Musi River Basin

Sambashiva Rao[1] Dr. A Manjunath[2] K Ramesh[3], Y Hima Bindu[4]
[1]*Assistant professor of Department chemistry,* [2, 4] *Assistant professor of Department of civil Engineering Maturi Venkata Subba Rao Engineering College Hyderabad-501510*
[3]*ChaitanyaBharathi Institute of Technology Hyderabad– 500075, Department of chemistry Rayalaseema University 518002*

Abstract: Musi river one of the major river system in Telangana state which is a source of water supply for different purpose ranges from drinking to industrial usage which flow through state capital city Hyderabad. In this present work study the quality of surface (River water) and ground water to check influence of musi river on quality of ground water from origin point to mouth. In the present work samples are collected at the regular interval of 16 km along the length wise both surface and ground water tested with standard parameters i.e. pH, EC, Hardness, Alkalinity and other captions. To find out the morphological, geological impact on surface and ground water quality.
Keywords: Geomorphology, water quality, surface relief.

I. INTRODUCTION

Along the river length Musiriveroriginate at Ananthagiri hills, Vikarabad District, Telangana. Peaks at about 575 mts above mean sea level (MSL). The following of river water moving down to ocean. In interact with earth compounds such as atmosphere, various rock type (lithosphere), soils, plants. Animal ranges from micro level to macro level. (Bio-sphere) during its journey from atmosphere to final density.Its Leaches so many Gases, in organic and inorganic mineral components. The quality of surface and ground water depends on environmental, Geological conditions. The river Musijoins Krishna river at Vadapally, Nalgonda District, At a stretch of 240 Km Fig(1) surface and ground water samples are collected at regular intervals of 16 km based on geomorphology conditions which are analyzed with standard parameters to check the quality of water.



Figer (1) Drainage map of Musi River

B. Geology Of Musi River

Musi river basin consisting of older metamorphics, peninsular Gneissic Complex (PGC), Dhawar Super group, Cuddapah Super group and Kurnool Group of Rocks. The hornblende schist's and amphibolites (older metamorphics). Which are the oldest Rocks occurs as Rafts enclaves and discontinuous linear bands with in the peninsular Gneissic complex (PGC).Main rock types are Granites, Granitiegneissic, Dolerites , gabbros , limestone's and quartzite.

C. Methods & Experimental Procedure

II. SAMPLE COLLECTION

The first step of the project is sampling. The sample collected should be small in volume, enough to accurately represent the whole water body. The water sample tends to modify itself in the new environment.
Basically we have 3 different types of samplings. They are:

ASSESSMENT OF GROUND WATER QUALITY SAROORNAGAR MANDAL, RR District, TELANGANA STATE

Samba Shiva Rao[1], Dr. A. Manjunath[2], K. Ramesh[3], Y. Hima Bindu[3*], M.Sarada Devi [4]
M.V.S.R. Engineering College, Hyderabad
C.B.I.T Engineering College, Hyderabad

ABSTRACT: The Indian sub-continent has vast water resources of perennial rivers and abundant ground water. The population is predominantly rural oriented, dependent on agriculture. In the absence of adequate surface water sources, people depend on ground water, a valuable resource and providing to be an important asset in many areas. Ground water is exploited for agriculture, domestic and other uses like industries etc. over exploitation of water resources, unplanned industrialization, urbanization and discharges of untreated waste contaminate both surface water as well as ground water sources and also unscientific use of fertilizers and pesticides aggravate the problem of contamination of water sources.

A Ground Water Quality study has been carried out assess the portability of ground water in various localities in Sarrornagar Mandal Ranga Reddy district. A total of 28 samples from different bore wells were collected and analyzed for 10 parameters to determine the water quality of that area. The water quality of samples collected in the study area has been compared with drinking water quality standards as per BIS 10500(1991) and CPHEEO manual on water sample and Treatment (Third Edition, May, 1999) Ministry of Urban Development, GOI, New Delhi.

KEY WORDS: Water analysis, Physical, Chemical parameters.

1. INTRODUCTION:

Ground water is precious and most widely distributed resource of the earth and unlikely any other mineral resources it gets its annul replenishment from the meteoric precipitation. The world's total water resources are estimated as 1.37 x 10 8 million ha-m. Of these global water resources, about 97.2% is salt water, mainly in oceans and 2.8% is available as fresh water at any time on the planet earth. Out of this 2.8%, about 2.2% is available as surface water and 0.6% as ground water. Even out of this, 2.2% of surface water, 2.15% is fresh water and glaciers and ice peaks are only order of 0.01% (1.36 x 10 6 million ha-m) is available in lakes and reservoirs 0.001%in streams, the remaining 0.01% being in the form of water vapour in atmosphere and 0.02% as soil moisture in the top 0.6m out of 0.06% of stored ground water only about 0.3% (41.11 x 10 4 million ha-m) can be economically extracted with the present drilling technology and remaining being unavailable as it is situated below a depth of 800m.

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Article

Polyethylene Glycols as Efficient Catalysts for the Oxidation of Bicyclic Monoterpenes by Ceric Ammonium Nitrate in Acetonitrile under Acid-Free Conditions: Kinetic and Mechanistic Approach

N. Rajitha, S. Shylaja, K. C. Rajanna, B. Yadagiri

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ABSTRACT

Polyethylene glycols (PEG) acts as efficient catalysts for the oxidation of bicyclic monoterpenes such as borneol, isoborneol, and camphor by ceric ammonium nitrate (CAN), a laboratory desktop reagent, in acetonitrile medium under mineral acid-free conditions. The kinetics of the reactions revealed first-order dependence on in both [CAN] and [bicyclic terpene]. The rate of oxidation is accelerated with an increase in [PEG] linearly, which could be explained by considering PEG-bound oxidant (PEG-CAN) as more reactive species than (CAN) itself. The mechanism of oxidation in PEG media has been explained through the participation of PEG-bound oxidant (PEG-CAN) and bicyclic monoterpene in the slow step.

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SOLUTION OF AN UNSTEADY FLOW THROUGH POROUS MEDIA PAST ON MOVING VERTICAL PLATE WITH VARIABLE TEMPERATURE AND HEAT SOURCE IN THE PRESENCE OF INCLINED MAGNETIC FIELD IN THE PRESENCE OF VISCOUS DISSIPATION

G. Narsimlu
Department of Mathematics, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, India
E-Mail: gnr.cbit@gmail.com

ABSTRACT

In this paper we analyze and study the problem of an unsteady flow through porous media past on moving vertical plate with variable temperature and heat source in the presence of inclined magnetic field and viscous dissipation is studied. The governing equations are discritized by Galerkin finite-element method and are solved by Crank-Nicolson method using C-Program.The effects of variable parameters to the velocity and temperature profiles are discussed graphically and the numerical values obtained for skin-friction have been tabulated.

Keywords: inclined magnetic field, viscous dissipation, heat source, porous media, finite-element method.

INTRODUCTION

The problem of free convection flows past a vertical surface has been studied extensively because of its wide application in many branches of engineering and sciences. Power generation systems, cooling of nuclear reactors, Geophysics, agriculture and thermal insulation. Rajput and Kumar [1] have analyzed MHD flow past an impulsively started moving vertical plate with variable temperature and mass diffusion. Seth and Ghosh [2] studied an unsteady hydro-magnetic flow in a rotating channel in the presence of inclined magnetic field. The effect of temperature dependent viscosity and thermal conductivity on unsteady MHD convective heat transfer past a semi-infinite vertical porous plate has been studied by Seddek and Salama [3]. Chamkha AJ *et al* [4] presented unsteady MHD free convection flow past an exponentially accelerated vertical plate with mass transfer, chemical reaction and thermal radiation. R.N. Barik [5] studied free convection heat and mass transfer MHD Flow in a vertical channel in the presence of the chemical reaction. Hossain M. A. [6] analyzed the effect on of hall current on unsteady hydromagnetic free-convection flow near an infinite vertical porous plate. Mohmed Abd El-Aziz [7] presented unsteady mixed convection heat transfer along a vertical stretching surface with variable viscosity and viscous dissipation. U.S Rajput and S. Kumar [8] have studied radiation effects on MHD flow past an impulsively started vertical plate with variable heat and mass transfer. A. Ogulu [9] studied the influence of radiation absorption on unsteady free convection and mass transfer flow in the presence of a uniform magnetic field. T. Arunkumar and L Anand Babu [10] have analyzed the study of Radiation effect of MHD flow past an impulsive started vertical plate with variable temperature and uniform mass diffusion through A finite element method

The objective of this paper is to study about the unsteady flow through porous media past on moving vertical plate with variable temperature and heat source in the presence of inclined magnetic field and viscous dissipation.

FORMULATION OF THE PROBLEM

Consider an unsteady MHD flow of a viscous incompressible radiating fluid by a vertical non conducting plate and the plate impulsively started moving with velocity u_0 taking into account in the presence of viscous dissipation and heat source. A uniform magnetic field B_0 is assumed to be applied on the plate with angle α. Initially the plate and the fluid are at same temperature T_∞^*. At time $t^* > 0$, temperature of the plate is increased to T_w^*. The governing equations of flow field are as under follows:

Momentum equation:

$$\frac{\partial u^*}{\partial t^*} = \nu \frac{\partial^2 u^*}{\partial y^{*2}} + g\beta\left(T^* - T_\infty^*\right) + \frac{\sigma B_0^2 \sin^2\alpha}{\rho} - \frac{\nu}{K^*}u^* \quad (1)$$

Energy equation:

$$\frac{\partial T^*}{\partial t^*} = \frac{k}{\rho C_p}\frac{\partial T^{*2}}{\partial y^{*2}} + \frac{\mu}{\rho C_p}\left(\frac{\partial u^*}{\partial y^*}\right)^2 + \frac{Q_0}{\rho C_p}\left(T^* - T_\infty^*\right) \quad (2)$$

where u^* is the velocity components in, g is the gravitational acceleration, β is the thermal expansion coefficient, T^* is the thermal temperature inside the thermal boundary layer, k is the thermal conductivity, ρ is the fluid density, μ – is the coefficient of viscosity, K is the permeability of the medium C_p is the specific heat at constant pressure, σ is the electric conductivity, T is

ORIGINAL PAPER

EFFECTS OF THERMAL RADIATION AND CHEMICAL REACTION ON UNSTEADY HYDROMAGNETIC MIXED CONVECTION FLOW PAST AN INFINITE VERTICAL PLATE

DEEPA GADIPALLY[1], MURALI GUNDAGANI[2], NARENDRA N.V. BABU[3]

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Abstract. *In this research work, the combined effects of thermal radiation and chemical reaction on an unsteady hydromagnetic mixed convective flow of incompressible and electrically conducting fluids past an infinite vertical porous plate has been made in presence of Soret and Dufour numbers. Energy equation takes into account of viscous dissipation, thermal radiation and Dufour effects. The governing differential equations are transformed into a set of non – linear coupled ordinary differential equations and solved using similarity analysis with finite difference numerical technique using appropriate boundary conditions for various physical parameters. Numerical solutions have been derived for the effects of different physical flow parameters on the velocity, temperature and concentration fields, skin – friction, rate of heat and mass transfer are discussed through graphs and results are physically interpreted.*

Keywords: *thermal radiation, chemical reaction, Soret and Dufour numbers, MHD, mixed convection.*

1. INTRODUCTION

In recent years the combined heat and mass transfer by mixed convection in a fluid saturated porous medium has its own role in many engineering application problems such as nuclear reactor design, geothermal systems, petroleum engineering applications, evaporation at the surface of a water body, energy transfer in a wet cooling tower and the flow in a desert cooler. A comprehensive account of the available information in this field is provided in recent books by Ingham et al. [1] and Vafai [2]. Kassoy [3] studied the effect of variable viscosity on the onset of convection in porous medium. Please use the article's title as file_name in small caps. Cheng and Minkowyz [4] studied the effect of free convection about a vertical plate embedded in a porous medium with application to heat transfer from a dike.

Bejan and Khair [5] studied the buoyancy induced heat and mass transfer from a vertical plate embedded in a saturated porous medium. Lai and Kulacki [6] studied the coupled heat and mass transfer by natural convection from vertical surface in a porous medium. The same authors [7] also studied the effect of variable viscosity on convection heat transfer along a vertical surface in a saturated porous medium. Elbashbeshy [7] investigated the effect of steady free convection flow with variable viscosity and thermal diffusivity along a vertical plate. Yih [8] analyzed the coupled heat and mass transfer in mixed convection

[1] Chaitanya Bharathi Institute of Technology, Department of Mathematics, 500075 Telangana, India.
E-mail: deepa.gadipally@gmail.com.
[2] J. B. Institute of Engineering and Technology, Department of Mathematics, 500075 Telangana, India.
[3] Sanjivani College of Engineering, Department of Engineering Science, 423603 Maharashtra, India.

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NUMERICAL STUDY OF HEAT AND MASS TRANSFER ON MHD FLOW PAST A PARABOLIC STARTED VERTICAL PLATE WITH VARIABLE TEMPERATURE, MASS DIFFUSSION ANDCHEMICAL REACTION IN THEPRESENCE OFVISCOUS DISSIPATION

G.Narsimlu Departent of Mathematics, ChaitanyaBharathi Institute of Technology,Gandipet,Hyderabad.

B. Shankar Goud Department of Mathematics, JNTUH College of Engineering Kukatpally, Hyderabad, TS, India

Abstract
The aim of this paper is to investigate the numerical study of heat and mass transfer on an unsteady MHD flow past a parabolic starting motion of the infinite vertical plate in the presence of chemical reaction parameter,mass diffusion and variable temperature. Mathematical model of this mechanism have been constructed in the form of partial differential equations andthe coupled partial differential equations are solved by efficient finite element method. The effect of velocity, temperature and concentration profile are examined for different physical parameters and is presented graphically.

Keywords:- MHD, Viscous dissipation,Finite element method, Mass diffusion,Heat and Mass transfer, etc.

I. INTRODUCTION

The phenomena of hydroagnetic flow with heat and mass transfer in an electrically conducting fluid pastavertical plate embedded in a porous medium has attracted the interest of in many engineering problems such as plasma studies,solar physics,magneto hydrodynamics generator, in the study of geological formations, thermal reservoirs and underground nuclear in metrology, and in the movement of earth's core. It plays an important role in petroleum industries, geophysics and in astrophysics. The effect viscous dissipation on unsteady free convection flow past an infinite, vertical porous plate with constant suction studied by Soundalgekar [1].Radiation effects on MHD free convection flow over a vertical plate with heat and mass flux was studied by Sivaiah et al. [2].HemanthPoonia and Chaudhary [3] analyzed the MHD free convection and mass transfer flow over an infinite vertical porous plate with viscous dissipation.Kishoreet.al[4] studied the effects of thermal radiation and viscous dissipation on MHD heat and mass diffusion flow past an oscillating vertical plate embedded in a porous medium with variable surface conditions . Hall effects on an unsteady MHD free convective flow past an impulsively started porous plate with viscous and Joule's dissipation have been studied by Anjali Devi et al. [5].Study of chemical reaction on effects on an unsteady MHD heat and mass transfer flow past a semi-infinite vertical porous moving plate in the presence of viscous dissipation was studied by Rajashekar and Shankar Goud [6]. Chandra Shekaret. al [7] studied the effect on unsteady MHD convective heat and mass transfer past a vertical plate with chemical reaction and viscous dissipation.Vijay Kumar and Vijay Kumar Varma [8] studied thermal radiation and mass transfer effects on MHD flow past an impulsively started exponentially accelerated vertical plate with variable temperature and mass diffusion.
D.Manohar, A.S. Nagarajan[9] have analysed the mass transfer effects on free convective flow of an incompressible viscous dissipative fluid.Effects of thermal radiation and MHD on the unsteady free convection and mass transform flow past an exponentially acceler.ted vertical plate with variable temperature a finite element solution was studied by Srilatha and Raja Rajashekar[10].

Inspired by the above mentioned investigation and applications, an effort is made to think about an unsteady flow of a viscous incompressible fluid past an infinite vertical plate with variable temperature and variable diffusion under the influence of magnetic field and viscous dissipation.Numerical results have been obtained for velocity, temperature and concentration by Galarken finite element method.

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Culturally Displaced Identity of the Protagonist in the Novel 'Wife'

Dr. Shirisha Deshpande

Assistant Professor, Department of Maths and Humanities, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana.
deshpandeshirisha72@gmail.com

Abstract— *Bharati Mukherjee was an Indian diasporic writer. Though she migrated to USA, her roots have always been in India, associated with the culture and tradition of the native country. As an expatriate writer her works project the cultural displacement faced by the immigrants and the impact that is left on them. Her novels project the different situations the migrated characters face, problems they overcome, the adjustments they make and the feeling of isolation.*

The present paper discusses the impact of cultural displacement on the main protagonist Dimple das gupta in the novel Wife written by Bharati Mukherjee and published in the year 1975.My objective is to project the problem faced by the first generation of immigrants by studying the character Dimple das gupta and the impact of cultural displacement on the immigrants by using the tools of psycho-analytical theory.

Application of Psycho- analytical theory to literary texts helps the readers to study the characters and find out the reasons for different behaviours .According to Sigmund Freud it is clash of id, ego and superego which are the three parts of the human psyche that makes transformation of personalities that result in different behaviors'. If people experience these type of psychological clashes they do not come under normal personality. As the founder of psychiatry Sigmund Freud mentioned the functioning of the mind at various levels in terms of psychology and neurology.

The main protagonist Dimple das gupta lives in a fantasy world and makes dream as source of her living in the native country and in the alien country. Her dream takes a violent turn because of the suppressed desires and makes her a negative character. One of the reasons being the cultural displacement. She dreams a beautiful life and a good husband but when her dreams are shattered she kills her husband. She turns out to be a different personality altogether who cannot find happiness in her marriage either in Calcutta or in USA.

Keywords— Culture, Cultural displacement, dream, Immigrants, India, psycho-analytical theory, tradition, USA.

I. INTRODUCTION

The novel *Wife* written by Bharati Mukherjee narrates the theme of immigrant experience in USA. It is the story of a middle-class Bengali girl who migrates to USA after her marriage. Mukherjee got the idea of writing this novel when she returns from USA to India after a long stay in USA for a period of ten years. She found a new face of India different from the innocent one what she knew during her childhood. That time she could get the material for the novel. She recollects "quite by an accident, I heard the question that shaped my second novel-'what do Bengali girls do between the ages of eighteen and twenty-one….."

The novel opens with a sarcastic note-"Dimple Dasgupta had set her heart on marrying a neurosurgeon". Dimple was very particular of marrying a neurosurgeon which depicts something unnatural. From the beginning of the novel we find that Dimple was not natural like other girls. All the time she used to think about marriage and it is going to change her life.

II. METHODOLOGY AND MATERIALS

Psychoanalytic dream interpretation is a part of psycho-analysis started by Sigmund Freud in the early part of the twentieth century. Psychoanalytic dream interpretation explains the way the subconscious mind works. According to Freud every dream represents a desire. Freud through his theory explained the unconscious wishes during the conscious state. In the sleep these unconscious desires are transformed into conscious form of dream. Sigmund Freud through Interpretation of dreams divided three different layers of the mind. The Unconscious, The pre-conscious, and The Conscious. According to psychoanalysis, the conscious mind controls the thought and emotion. According to Freud there is a continuous conflict between the 'ego' and the 'id' during sleep. 'Id' gets changed when it comes in contact with the external world. During sleep super ego is repressed because of the absence of the voluntary action and subconscious impulses become more and are pushed towards conscious state.

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Architectural Representation for Inference rules generation for Astrological Predictions using induction of Horoscope Charts

CNVBR Sri Gowrinath[1], B Srinivasa S P Kumar[2]

[1, 2] *Assistant Professor, Department of MCA, CBIT, Hyderabad, India.*

Abstract

Astrology not only specifies the future prediction, but also the past activities happened in our life. Astrology is the subset of Astronomy which represents our Galaxy system. Although saying that Astrology had 40 Decades of age, its origin was in Krutayuga. Horoscope chart is an Astrological representation that contains the movement of Nine planets (Navagrahas) located in twelve houses (Rashis) with periodic positional movements. In Horoscope representation some houses might be empty and others contain one or more planets.

Horoscope comprises of various charts such as Lagna, Amsha, Bhava and so on and by using these charts we can predict in various ways. Assumption that any astrological prediction is about 70% of accuracy, but the number of believers increasing as well as with proportionate rejections. Artificial Intelligence is an interdisciplinary domain, most widely using in various fields. It is also very useful to develop inference engine for Astrological predictions.

The current paper specifies the Architectural overview for Astrological Inference engine that uses person's Date of Birth using Horoscope Charts. Because of Astrology is having vast scope and so predictions happened in various aspects such as studies, profession, colour complexion, assets and liabilities, marriage and so on.

Methodologies such as zero8, Simple Cart, Decision Table, Case Based Reasoning were used to evaluate some scope. Machine Learning algorithms such as Support Vector machines, Linear Regression, Logistic Regression and so on are useful to compute the Astrological predictions. Using Astrology, country's growth also be predicted using current positioning of Nine Planets. Training and Test sets are going to be used in designing inference rules. Predictive Modelling is the centre to evaluate inferences.

Keywords: Astrology, Horoscope, Artificial Intelligence, Case Based Reasoning, Machine Learning, Predictive Modelling.

INTRODUCTION

Astrology was one of the oldest domains whose origin was in Krutayuga. Astrology is not only a simple prediction analysis, but also have computations for huge aspects in our daily life such as the mindset, study, childhood, job, place of working, profession, marriage, assets or liabilities , probability of children, health and so on. Astrology is having increase of believers with traditional facts and refuses also as of lack of standardized facts[1].

Horoscope is the representation for Astrological concepts, which are represented with Nine Planets positioning in Twelve Houses (each one represents one Rashi).Astrology's another benefit is specifying country's Political, Defence, Agricultural like issues.

Artificial Intelligence concepts such as Knowledge Databases, Expert Systems like concepts are going to be used to generate Inference rules and engine. Some surveys regarding the information extraction also gathered Road side or cordon interviews[2]. In case of Astrology we extract information by analysing training set to develop a model and Test set to assess the developed model to identify the prediction accuracy as per the figure1.

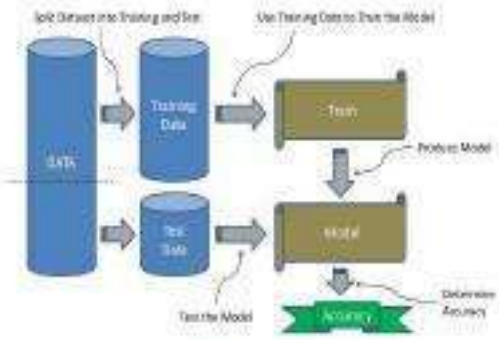

Figure 1

In Astrology some common patterns evolved using planets mapped to Horoscope chart using techniques such as Case Based Reasoning[1]. Horoscope specifies that the Nine planets (which are considered visible in our Galaxy System are used to compute predictions) move around twelve houses which are referred to as twelve Rashis. Each planet is having its own influence on person based on the current position. At any instance of time each and every rashi can have zero or more planets which can be represented as below figure(sample representation).

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Research paper

A Two Way Validation Framework for Cloud Storage Security

Anantula Jyothi[1]*, Baddam Indira[2]

[1]Asst.Prof., Anurag Group of Institutions.
[2]Assoc.Prof., Kasturba Gandhi Degree and PG College.
E-mail: Indira.baddam@gmail.com
*Corresponding author E-mail: jyothianantula@gmail.com

Abstract

High Performance Computing (HPC) has become one of the predominant techniques for processing the large scale applications. Cloud environment has been chosen to provide the required services and to process these high demand applications. Management of such applications challenges us on three major things i.e. network feasibility, computational feasibility and data security. Several research endeavours are focused on network load and computing cloud date and provided better outcomes. Still those approaches are not able to provide standard mechanisms in view of data security. On the other side, research towards enabling the auditing features on the cloud based data by various researchers has been addressed but their performance is poor. However, the complexity of the audit process proven to be the bottleneck in improving performance of the application as it consumes the computational resources of the same application. Henceforth, this work proposes a novel framework for cloud data auditing at multiple levels to audit the access requests and upon validating the conditions of one level, the connection request will be moved to the further complex levels in order to reduce the computational loads. The proposed framework determines a substantial reduction in the computational load on the cloud server, thus improves the application performance leveraging the infrastructure use.

Keywords: Cloud storage, cost reduction, data auditing, Data security, framework.

1. Introduction

In the recent development, the growth in cloud computing in technical, business and research prospective is the point of focus. The majority of the organizations have adopted benefits from cloud computing such as efficient deployment and management of the services, agility of the business cases for DCO oriented cases, uptime of the services and customer satisfaction. The work of Marston et al. [1] has demonstrated the benefits to be achieved for business cases and the work of M. A. Vouk et al. [2] has proven the research significance of cloud computing. The massive growth is been observed in case of software as a service scenarios. Thus the evaluation of healthcare as a service as demonstrated by A. K. Jha et al. [3] and also finance as a service as demonstrated by H. T. Peng et al. [4] showcased the modernization of the regular software on cloud away from the contemporary usages. Not alone for the business or commercial spaces, the benefits have also reached to the education domain as well. The case study by the M. Mircea et al. [5] has shown the new paradigm of education as a service. Nevertheless, this growth in the cloud computing has made the industry, consumers and the researchers to think about the contingency of these adoptions of cloud computing. Various researchers have expressed their researches and works in order to decide the best possible security features of the cloud computing. However, the challenge in deploying the security protocols on cloud is to identify the accurate abode. Multiple opinions from research attempts have shown multiple benefits and flaws of deploying the cloud security at service providers' end or at consumers end or the end of cloud data centres.

The work by M. Armbrust et al. [6] presented a decent survey of the existing security measures and the work by L. Liu et al. [7] contributed significantly in identifying the security policies to be adopted for social applications. In the other hand the findings by T. Mather et al. [8] proven that the security expectations for enterprise applications are different from the other aspects.

As realized the deployment of cloud security protocols can only be justified by considering the fundamental purpose of the application. Nonetheless, the focus of this work is to analyse and propose the security measures for data on cloud computing. Thus this work proposes the security deployments on cloud data centres. The primary challenge of the data centres are the continuous growth in the data in gigantic and exponential rate as showcased by M. Pop et al. [9] and M V Narayana et.al[23]. The elaboration of this issue is highly analysed and also forecasted in the work by A. Greenberg et al. [10] and Q. Zhang et al. [11].

Henceforth, the challenges identified as

- The inclusion of the security policies must not be done in the application level as the in order to estimate the performance of the cloud services must be carried out separately and specifically.
- The traditional security policies for verification must be revamped as the existing policies can be vulnerable to the hackers.
- Access of the data is provided to the data centre owners or the consumers or the service providers or the data auditors. The specific access policies by be rooted in the security policies.
- Finally, the inclusion of the security policies from the data centre end must incorporate the verifications of the access requests from data centre controllers, service owners, consumers and most importantly the data auditors.

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Rank Analysis Clustering of Challenges (Activities) of an Autonomous Educational Institution Examination Branch

C N V B R Sri Gowrinath
Assistant Professor, CBIT

***Abstract*-Autonomous affiliation is a great representation and also challenging one for an Educational Institution / College. Before and after achieving Autonomous affiliation, an organization has to follow a set of rules and has to maintain the standards. An Institution requires two essential things for successful Autonomy. They are Admissions branch and Examination branch. This paper mainly concentrates on second element. An Autonomous College Examination branch has challenges in form of various activities. Some activities can require confidentiality and the others cannot.**

Even though an Organization is autonomous, few activities still work under authorized University under which the Organization got affiliation. Autonomous Organization has to follow the University rules/regulations as well as its own. In Autonomous College Examination branch activities can be fulfilled with various levels of designated professionals. An autonomous institution Admissions and Original Degree document issuing by the authoritative university only.

***Index Terms*-Autonomous, Clustering, Rank Analysis.**

INTRODUCTION

Data Mining is an extraction of Knowledge from various data sources such as data bases, flat files, Data marts and so on. In any activity we require related knowledge for analysis and to take further decisions. A knowledge oriented decision helps in success of an organization. In Data Mining, Knowledge Extraction can be performed using techniques such as Clustering, Association, Classification, Prediction and so on. To perform Clustering, we have algorithms such as K-means, K-medoids, PSO, Adaptive methods so on[1].

In Clustering mechanism, the data items can be categorized into groups (Clusters) so that the intra cluster distance is minimum and inter cluster distance is maximum as possible. Clustering algorithms widely used in Knowledge Data Discovery (KDD). In Clustering we've supervised and Unsupervised learning[2]. We can use unsupervised learning which is a knowledge extraction using Clustering without any prior knowledge. In this we cluster activities of an Autonomous Examination branch activities to be conducting in a regular manner based on supervised learning. We can also cluster the activities using Case Based Reasoning(CBR) using similarity of activities[3].Also sometimes clustering can be performed by Analogy[4].

An Educational Institution can be promoted as autonomous under a University if and only if the university believes that an organization can be able to run itself as Autonomy. Generally initial time limit after getting autonomy is three years and thereafter the affiliation will be renewed. Other Government bodies give their Accreditation via Grades to an autonomous institution. An Autonomous Educational institution has two major components – Admissions branch and Examination branch.

As per the principle of autonomy of inquiry and heeding the warning of the constraint of normal science, the Chinese management research community can shape its own future by engaging in research that may contribute to global management knowledge and address meaningful local management problems[5]. Similarly Autonomy can improve an organizational abilities and also solves many problems locally as possible.

The initiation to take an Admission through an entrance exam by University then after the college work starts. All the initiation to report in the organization taken care by Admissions branch. Further activities by individual departments and finally for examinations conduction by Examination branch. In Examination branch various activities are going on in prior to the Examination conduction, during and after completion of Examinations. How to handle various activities is also a knowledge extraction process as the activities should be done in a proper and particular order. Each activity has its own importance. The activities categorizations can be conducted by using Artificial Intelligence.

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A PROTOCOL FOR PRIVACY MINING OF ASSOCIATION RULES IN DISTRIBUTED DATABASES TOWARDS THE UPGRADATION OF EFFICIENCY

B Srinivasa S P Kumar[1], M. Chandrasekhar Varma[2], CNVBR Sri Gowrinath[3]
[1]Assistant Professor, Department of MCA, CBIT, Hyderabad, India

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Detection of Intrusion Using Decision Tree Based Data Mining Technique

M. Chandrasekhar Varma[1], B Srinivasa S P Kumar[2]
[1]Assistant professor, Department of CSE, D.N.R College of Engineering and technology, Bhimavaram, Andhra Pradesh, India
[2]Assistant Professor, Department of MCA, CBIT, Hyderabad, Telangana, India

ABSTRACT

Now a days computer attack has turned out to be exceptionally normal. Despite the fact that there are numerous current instruments for Intrusion detection, yet the primary issues is the security and precision of the system. This paper is presented with J48 decision tree data mining techniques as an intrusion detection system and ORNL (Oak Ridge National Laboratories) data set. This paper demonstrates that Decision trees gives higher precision than other regulated strategy.

Keywords: Decision tree, Data Mining, J48 algorithm, Intrusion Detection.

I. INTRODUCTION

These days, numerous associations and organizations utilize Internet benefits as their correspondence and commercial center to work together, for example, at EBay and Amazon.com site. Together with the development of computer arrange exercises, the developing rate of system attacks has been progressing, affecting to the accessibility, classification, and uprightness of basic data. In this manner a system must utilize at least one security devices, for example, firewall, antivirus, IDS and Honey Pot to keep vital data from criminal endeavors. Because of expanded

As system based computer systems assume progressively indispensable parts in current society, they have moved toward becoming intrusion detection systems give following three fundamental security capacities Data classification, Data respectability, Data accessibility [12].

Classification (or mystery) implies that data is revealed just as per strategy, respectability implies that data isn't pulverized or adulterated and that the system performs effectively, accessibility implies that system administrations are accessible when they are required [13].

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Performance Analysis of Bayes Classification Algorithms in WEKA Tool using Bank Marketing Dataset

[1] M. Purnachary, [2] B. Srinivasa S P Kumar, [3] Humera Shaziya
[1][3] Assistant Professor, Dept. of Informatics, Nizam College, OU, Hyderabad
[2] Assistant Professor, Dept of MCA, CBIT, OU, Hyderabad

Abstract: - Data Mining is an interdisciplinary field that aims to extract knowledge or insights from data in various forms, either structured or unstructured. Classification is a supervised learning approach of data mining and It is used to classify huge data. WEKA is powerful machine learning tool that contains many inbuilt algorithms to extract knowledge. In this paper we tried to analyze the performance of two built in Bayes type of Classification algorithms (Bayes Net, Naïve Bayes) in WEKA tool using Bank Marketing Dataset which is extracted from UCI Repository. It has been observed that Bayes Net classification algorithm performed better compared to Naïve Bayes algorithm.

Index Terms- Classification, Knowledge, Naïve Bayes, WEKA, Confusion Matrix.

Article

Robust Frequent Item set Mining on Massive Data

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- 100% FDI in Single Brand Retail
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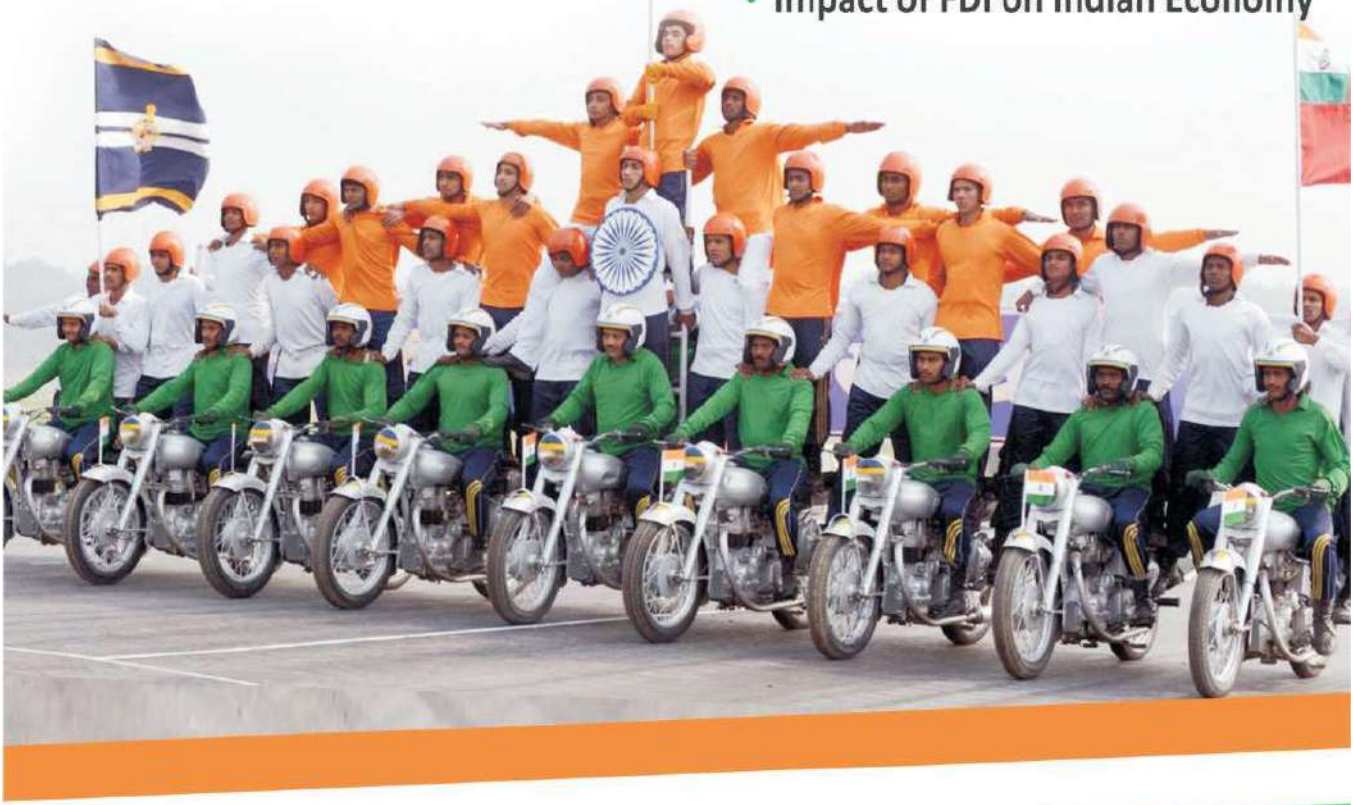

ECONOMIC CHALLENGER

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IMPACT OF FOREIGN DIRECT INVESTMENT (FDI) ON INDIAN ECONOMY

Dr.A.R.Aryasri | Professor, SMS, CBIT Hyderabad, E-mail : aryasri9@gmail.com
M.Sangeetha | Asst Professor, SMS, CBIT, Hyderabad, sangeetham822@gmail.com

ABSTRACT

India is the most critical democracy and the sixth-largest in the world measured by nominal GDP and the third-largest by Purchasing Power Parity (PPP) and also the tenth most industrialized country in the world. With its consistent growth performance and abundant high-skilled workforce, India provides enormous opportunities for investment, both domestic and foreign. Since the beginning of economic reforms in 1991, significant reform initiatives were taken in the fields of investment, trade, financial sector, exchange control simplification of procedures, enactment of competition and amendments in the intellectual property rights laws, etc. India provides a liberal, attractive, and investor-friendly investment climate. By 2035, India is projected to be the third largest economy in the world after US and China. As the third-largest economy in PPP terms, India is a preferred destination for foreign direct investments (FDI) with strengths in information technology and other significant areas such as auto components, chemicals, apparels, pharmaceuticals, and jewelry. As a result of a series of ambitious and positive economic reforms aimed at deregulating the economy and stimulating foreign investment, India has positioned itself as one of the front-runners of the rapidly growing Asia Pacific Region. According to United Nations Conference on Trade and Development (UNCTAD) World Investment Report 2016, India has moved up by one rank to become the sixth most preferred investment destination. India's FDI policy has been gradually liberalized to make the market more investor-friendly and contribute to economic growth of the Indian Economy. The recent reforms substantially have reduced industrial licensing requirements, removed restrictions on expansion, and facilitated easy access to foreign technology and FDI. This study focuses on a) the main features of policy on Foreign Direct Investment of Government of India b) the trends in the FDI inflows c) the analysis of sectors attracting highest FDI d) the relationship between GDP Growth rate and increase in FDI inflows for the select segments over the period of 16 years(2000-2017) and their implications.

Keywords: Ease of Doing business, FDI, Make in India, PPP, Sectors of Indian Economy, GDP.

INTRODUCTION

Foreign Direct Investment means an investment by non-resident entity/person resident outside India in the capital of an Indian company. It is the intent and objective of the Government of India to attract and promote foreign direct investment to supplement domestic capital, technology, and skills, for accelerated economic growth. International Monetary Fund (1977) defines FDI as Investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, the investor's purpose is to have an active voice in the management of the company. FDI plays an essential role in the development of an economy. FDI has helped the Indian economy grow, and the government

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Impact of Automation versus Human Labour on Future IT Jobs in India

S. Tulasi Ram, Assistant Professor, School of Management Studies, Chaitanya Bharathi Institute of Technology, Hyderabad, India. E-mail:tulasiram.mba2010@gamil.com

B. Lokesh, Assistant Professor, Computer Science & Engineering, Chaitanya Bharathi Institute of Technology, Hyderabad, India. E-mail:Lokeshjoel@gmail.com

Abstract--- This paper looks to examine the future trend of jobs in IT over coming 5 years. This is basically because of automation as Robots are replacing humans. Due to this future job landscape in India will change as this eliminates rule based jobs. As rule based jobs can be made by algorithm and hence machines will replace those kinds of jobs. This paper depicts the importance of adapting to changes and learning more skills that help to sustain in the future IT jobs that get created.

Keywords--- Information Technology, Automation, Professional Labour Market.

JEL Classification--- L86, J44.

I. Introduction

There is prediction from a US research firm that IT Indian services industry will lose 6.4 lakh low-skilled jobs because of automation in the next five years. This research have identified the painful truth which is about to happen, but Indian industry experts are urging caution and simultaneously looking towards creation of new jobs in large numbers.

But this is just prediction but nobody's really seen where automation and robotics will really lead to. It is believed that even if there will be some impact of automation, overall technology adoption will basically lead to more jobs creation across sectors.

With these kind of extensive changes in the technology era, the Indian IT industry has already started taken action plan to make the talent pool equipped with new technologies accordingly. According to the survey of around 500 Indian IT companies across India found out that most of them in the country are looking at widely hiring of junior and mid level employees, while most of the employees are given pick slips in the senior slab.

It is also evident based on the survey that most of the job cuts of IT employees will be very high like never before in the Indian IT industry. This trend is likely to be continued for next few years.

Depending on all these predictions, it is recommended that IT professionals have to increase their skill set as soon as possible to be up to date with the latest technologies where demand for talent is expected to be huge

Increase in new enabling technologies such as Software as a service (SaaS) offerings, Artificial Intelligence, Cloud based ERP software,Accuracy and cost efficiency is very important to maintain the competition which drives most of the businesses currently. With this kind of revolution, by adapting to these technologies will help young professionals to gain Talent Refresh cycle in the Indian IT industry which would continue for upcoming years.

We may see that overall Indian IT employment outlook is looking positive, we can see that the focus is now shifting from scaling of the recruitment to increasing the skills of their employees by giving training. This way the employers are planning for the future.

Most of the employers said they want trained freshers in the system. If we see the present companies, they have already started looking for the talent in the market who are already equipped with the latest technologies and skills in the market.

The study also depicts that advancing of probation will be the new normality of the industry so as to decrease the learning curve.

In the preset market scenario, what should companies do is they can change their organization’s engagement models, delivery capabilities and go-to market approach so that they will be able to overcome the future challenges and fast changing needs of digital transformation.

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Consumer Buying behaviour – A Study with reference to Organic Products in Hyderabad City

B. Lavanya
Asst. Prof
SMS department
CBIT-Gandipet

Dr. S. Saraswathi
Associate .Prof
SMS department
CBIT-Gandipet

Abstract

Global market for organic products is increasing phenomenally as consumption of organic food has grown annually at more than 25 per cent in the last decade. It is observed that the most preferred place for buying safer and healthier products is, an organic store and the reason being is discussed in many research papers. The present paper deals with pre-purchase (Why-reasons for buying), purchase (what products are bought) and post purchase behaviour (satisfaction) of the consumers towards Organic products and the study also reveals the challenges faced by the retailers in marketing the organic products. Both qualitative and quantitative data used for the study revealed interesting facts that help retailers and consumers topromote organic products and sustainable consumption

KEY WORDS: SAFETY AND HEALTY PRODUCTS, SUSTAINABLE CONSUMPTION

INTRODUCTION:

Viral videos about chemically produced vegetables and fruits,artificially grown chicken and chemically shaped eggs, plastic rice made people worry about their health and led to popularity of organic segment in pushing forward. The rising consumers' consciousness about quality and safety of food led to increasing demand for organic food products in various parts of the world (Vindigni et al., 2002).Organic pulses and food grains dominated demand for organic food in the country since 2015 and it is believed that the segment is anticipated to continue dominating the market through 2021. Olivas and Bernabeu (2012) have concluded that the organic food consumption can be considered the effect of an interaction between eating a healthy diet, showing respect for environment and the individuals' sociability. From the literature review it is evident that this generation in particular who is educated and smart prefer more to consume organic products as they believe that spending on healthy food isbetter than to spend on medical treatments. It necessary to understand the buying behaviour of the consumer towards the organic products, as it makes the retailers understand the their perception and attitude, this in turn helps them to cater their services in better manner. So the present study is carried out.

PURPOSE OF THE STUDY:

As per TechSci Research report, "India Organic Food Market By Product Type, Competition Forecast and Opportunities, 2011 - 2021", India organic food market is expected to grow at a CAGR of over 25% during 2016-2021, and this is due to increasing use of synthetic chemical fertilizers and pesticides in non-organic products that lead to various health issues such as cancer, obesity and birth defects.Reports suggest that the government is making efforts to increase adoption of organic food, by the way of launching various policies and expanding land area under organic cultivation over the next five years.The study conducted by (Krishnakumare and Niranjan, 2017) has revealed that consumers' behaviour plays a major role in organic food products segment. The marketers of organic foods need to be innovative and dynamic to meet the changing purchase behaviour for organic food products. Thoughthere is an increasing market in our country

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Innovative Human Resource Practices in Banking Sector

Dr. T. S. Poornachandrika

Senior Asst. Professor, SMS, CBIT

Poornachandrika37@gmail.com

ABSTRACT

In the the era of globalization, the sustainability of business organisations,including banking sector has become a challenge.. This research paper is an humble attempt to discuss on various innovative Human Resource Practices in Banking and Financial Sector for healthy work environment. Post independence banking sector has witnessed various reforms . This paper dwells into about various HR Practices in general banking industries.All banks in India are operating as per the guidelines and framework of Reserve Bank of India. There is need for knowledgable and multi-skilled employees in banking sector. To perform at their best,banks are better adopting newer technology such as e-banking, networking banking, ATM's etc. Though updated technologies are available still there is a service quality gap between the customers needs and expectation from banking industry, the result is the internal employees of banks are always complaining that they are working under tremendous stress and pressure and it is extremely difficult for them to cope with the demands of the work therefore there is an urgency for training for ideal working.

Keywords: *Innovation, Ideal Working, Sustainability,multiskilled employees*

INTRODUCTION

In Modern times complicated and volatile business environment have created enormous challenges to organizations. Skilful workforce and efficient human resource management is very much required for survival in this competitive world. Innovative HRM practices refer to organizational activities which are aimed at managing the pool of human resources and ensuring that the resources are employed towards the fulfilment of organizational goals (Tiwari and Saxena, 2012). Fundamentally the domain of HRM deals with planning, acquiring staffing, retaining ,developing the human resources, and managing people separation/exit till the tenure of the employee in the organisation (Chakrabarty, 2012). Therefore, the major challenge for any organisation is to

manage its human resources in such a way that it can fulfill their need for the right man in the right jobs. Innovation is the key to cost economy.It definitely results in increasing profitability and a better life for society. Schumpeter (1934) discussed about innovations in production. These innovations may facilitate the increased demand or supply. Innovations can be made in any field. In HRM innovative practices are developed for employee retention, motivation and to enhance their loyalty as well as sense of belongingness to the organisation. Therefore, the Innovative Human Resource Practices, refer to modern and improved

Empirical Evidence on Impact of Capital Structure on Performance of Banks: A Study on Indian Banks

K.Bhagyalakshmi[1], Dr.S.Saraswathi[2]

[1] Assistant Professor,

School of Management Studies, Chaitanya Bharathi Institute of Technology,

Gandipet, Hyderabad, Telangana State.

[2] Assosiate Professor,

School of Management Studies, Chaitanya Bharathi Institute of Technology,

Gandipet, Hyderabad, Telangana State

[1] bhagya _saride@yahoo.com, [2]singisaraswathi@yahoo.co.uk

Abstract

This paper, empirically examine the relationship between capital structure and performance of listed bank in India from 2013 to 2017. Data was collected from National stock exchange and annual report of the listed banks. Correlation and multiple regression analysis are used for present analysis Performance is measured by return on assets, return on equity and earnings per share. Determinants of capital structure includes long term debt to capital ratio, short term debt to capital ratio and total debt to capital ratio. . Findings of the study revealed there is an impact of capital structure (TD and TD) on performance of banks as measured by ROA and EPS.

Keywords: Capital, Long term Debt, short term Debt, Return on Assets, Return on Equity and Earnings per share.

1. Introduction

The capital structure of an enterprise is the mix of debt including preference stock and equity; this is referred to as the firms' long term financing mix, Watson and Head (2007). Most of firms for making financial decision they prefer to see that debt is equal to equity so it can have an optimum capital Structure. Financial manager's job is to come out with an optimal capital structure which maximizes share holders value (opler, saron, titman1997) There are also some capital structure theories since starting of MM Theory (1958) to existing theories like tradeoff theory and agency theories attempted to determine optimal capital structure of firms which they need to pursue. Corporate finance theories which born with the publication of Modigliani and Miller's (M&M) theory of corporate capital structure in 1958.The theory proves that the choice of a firm's capital structure will not affect its market valuation. When a capital market is free of taxes, transactions costs, and other frictions etc. Among the theories, the most prominent theories which explain the capital structure of the firms are static tradeoff theory, pecking ordered theory and agency theory. Barclay and Smith (1995) investigated and provide evidence that large firms and low growth rate firms prefer to issue long-term

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The Impact of HR-Outsourcing On The Performance Management System Of The Organisations With Special Reference to IT And Pharmaceutical Industry

Dr. T.S. Poornachandrika
Associate Professor, SMS,CBIT

ABSTRACT

To survive in a competitive global market and to accomplish long term growth, organizations need to develop and focus on their core competencies. Organizations need careful planning and strategy implementation to increase productivity levels and to change the beliefs, attitudes and values of employees .This is important as employees be in a better position to adapt to new technologies and future challenges. Practice in business and economic activities are ever changing. Most industries have transformed completely from manual processes to, automated and computerized technologies Revelations indicate that manufacturing industries have come up with sophisticated products that require man power with special skills Moreover, information communication technology usage and faster information flows have revolutionized way of life and the way businesses operate. The needs and demands of consumers are forcing organizations to change and restructure to ensure that they keep up with market demands. All of these factors are facilitating organizations to change in order to survive, and it is clearly evident that only the competent organizations succeed.

To do that, organizations need to focus on main and core competencies while contracting noncore and repetitive functions to an external service provider who will carry out that function as one of their core activities. This outsourcing strategy can allow organizations to focus on their core competencies to increase efficiency without spending time to invest in people and technology. This production strategy facilitates the organizations to become increasingly profitable, and better be able to cater to local and international customer base. Outsourcing can be defined as an organization delegating their non-core functions to an external organization that provides a particular service, function or product. Market changes reveal that outsourcing is no longer confined to information technology (IT) services, but has expanded to financial services, banking services, engineering services, creative services, data management services, hospitality and clinical laboratories or laboratory medicine, and human resource management (HRM) Outsourcing the Human Resource (HR) function is one of many ways to improve an organizat

Need of the study

The overall purpose of the study is to explore and explain HR outsourcing by the select organizations.The primary purpose of this research is to test this concept of human resources outsourcing in the organizational environment.The research hypothesis and the objectives were made to study the over allreasons,benefits ,performance and achievement of individual and organizational objectives.

SIGNIFICANCE OF THE STUDY

Modern organisations strive for the number one position in the era of global hyper completion.Forthis,the organizations need to concentrate on their core competencies and strategic business rather on wasting the time on the routine,repetive administrative burden hampering the productivity.The study attempts to find out the facet of various dimensions behind human resources outsourcing process.The present study takes into account intrinsic and extrinsic factors affecting the HR outsourcing parameters of the selected organizations.

PERFORMANCE ANALYSIS USING CAMEL MODEL- A STUDY OF SELECT PRIVATE BANKS

1. B. Lavanya 2. T. Srinivas
1.Assistant. Professor 2.Research Student
1.SMS department , CBIT-Gandipet: Hyderabad-Telangana
2. SMS department , CBIT-Gandipet: Hyderabad-Telangana

Abstract:

As a country's financial system depends upon the financial soundness of banking industry, it is very much essential to measure it. The main objective of this study is to analyze the financial performance of select private sector banks and compare them using CAMEL Model.

The study is related to a period of five years from financial year 2012-2013 to 2016 – 2017. The CAMEL model helped to measures the performance of banks from each of the important parameter like Capital Adequacy, Assets Quality, Management Efficiency, Earning Quality and Liquidity. From the analysis of select private banks, ICICI Bank, HDFC Bank, KOTAK MAHINDRA Bank, AXIS Bank and YES Bank , the study is concluded giving the relative positions of the banks.

Index Terms: Financial Soundness, performance, CAMEL Model

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1. INTODUCTION:

Though, Significance of performance evaluation in a Banking sector, for sustainable growth and development has been recognized since long it still requires a system that first measures all aspects of banks and then brings out the strengths and weaknesses of the banks to ensure further improvement. With the advances in computational tools, performance evaluation systems have evolved over a period of time from singleaspect systems to more comprehensive systems covering all aspects of banks. CAMEL Model is one such rating system that proved to be better for performance measurement, evaluation and strategic planning for future growth and development of the Indian banks in the light of changing requirements of this sector.

2. REVIEW OF LITERATURE:

CAMEL model as a tool is very effective, efficient and accurate to be used for evaluating the performance in banking industries and to anticipate the future and relative risk.CAMEL, as a rating system for judging the soundness of Banks is a quite useful tool that can help in mitigating the conditions and risks that lead to Bank failures. The CAMEL stands for

C - Capital adequacy A - Asset quality M – Management E - Earning

L – Liquidity

Majumdar (2016),measured the financial performance of 15 banks in Bangladesh with CAMEL Model. Using Composite Ranking, average and ANOVA he concluded that there had been significant difference in the

CREDIT RISK MANAGEMENT IN NBFCS-A COMPARITIVE ANALYSIS

B. Lavanya , Y.Maheshwari
Asst. Prof. , Student
SMS department, CBIT-Gandipet

ABSTRACT- Credit risk management (CRM) is the practice of mitigating losses by understanding the adequacy of a company's capital and loan loss reserves at any given time. The study "Credit risk management in NBFCs-A Comparitive Analysis." is conducted as there is a vital need to compare the CRM practices of the companies. The objectives of the study are: i) To study the credit risk management system in the non-banking sector. ii) To examine credit risk and probability of default of the select companies. iii) To determine the solvency credit worthiness of the select companies. iv) To compare the level of CRM practices of the companies under study. With reference to this study, the data is collected from secondary sources .The data is analyzed using Merton model for credit risk and ratio analysis. Using Merton model, the probability of default of Muthoot finance is found to be lesser when compared to that of Bajaj finance. Both the companies are having higher NPAs which are to be reduced by adopting sufficient credit risk management practices.

Keywords: Credit risk, Probability of default, Merton model

INTRODUCTION

Credit risk may be defined as the potential that a borrower or counter-party will fail to meet their obligations in accordance with agreed terms. In short, credit risk is the probability of loss from a credit transaction. Credit risk management is the assessment of risk that comes in an investment. NBFCs have been playing a complementary role to the other financial institutions including banks in meeting the funding needs of the economy. NBFCs account for 12.3% assets of the total financial system. Non-banking finance companies (NBFCs) are at a higher risk of defaults than traditional banks, due to their higher exposure to non-traditional segments of the market. Therefore, there is a need to study the techniques of credit risk management employed in NBFCs.

REVIEW OF LITERATURE

K.C. Iyer and Dhruba Purkayastha,(2017), explored the relevance of credit ratings for infrastructure project finance, historical credit default data for infrastructure projects around on credit risk assessment and provided directions for policy makers, regulators, and lenders to reduce the use of external credit ratings for guiding investments in infrastructure projects.*Md. Abdulah Ali Bazi,(2017)*,in his study, analyzed that Credit Risk Management(CRM) can be an effective tool to reduce NPA accumulation in selected financial market players in India. *Gupta ,Geetika,(2017),*identified that, to achieve effective Credit Risk Management, banks need to improve in five areas: Organizational structure of Credit Risk, Credit Process, Credit Decision Analytics, Credit Risk Reporting and Technology.

*Omid Sharifi,(2016),*in his study, reported three credit risk indicators, which are the Capital Adequacy ratio, NPA ratio and Credit-Deposit ratio and four profitability ratios, which are: Return on Assets, Return on Equity, Net Interest Margin and Net Profit Margin. *Chandapurkar,(2015),*found that Credit rating can give only an indication and cannot give any pool proof and cut percent reliability of its assessment. *Andrew R. Finley, Stephen J. Lusch, and Kirsten A. Cook (2015)* ,studied the effectiveness of the R&D Tax Credit-Evidence from the Alternative Simplified Credit.

P.A.Sakyi,(2014, from the results of the study revealed that NBFIs have been safe as far as bankruptcy is concerned, over the period under study. *Idowu Abiola,(2014),*in his research paper, revealed that credit risk management has a significant impact on the profitability of commercial banks.*Fernando García,(2013),*has found a model to estimate the solvency function, that allows for a set of companies to be ranked according to their solvency level, by considering a relevant set of economic and financial variables and going beyond the described restrictions of statistical techniques.

GD Gyamfi, (2012),in his research, examined the effectiveness of the credit management techniques used by the firms. He recommended that firms should encourage their clients to insure against risk that might affect their businesses and help in managing their clients risk bearing portfolio. It was also recommended that the continuous use of written policies that guided most of the firms on credit granting should be encouraged by all the firms.*Dimitrios Louzis ,Angelos Vouldis and Vasilios L. Metaxas*,(2012) discussed the Macroeconomic and bank-specific determinants of non-performing loans in Greece in his study titled:"A comparative study of mortgage, business and consumer loan portfolios"*Olaf weber,(2011),* concluded that Canadian banks are proactive regarding environmental examinations of loans and that there is a need for a more accountancy related reporting on environmental risk management in financial institutions. Further research is needed to be able to calculate costs and benefits of integrating environmental and sustainability issues into the credit risk management.

*Danson Musyoki,(2011),*emphasized on all the parameters that will have an inverse impact on banks' financial performance, however the default rate is the most predictor of bank financial performance vis-à-vis the other indicators of credit risk management. The recommendation is to advice banks to design and formulate strategies that will not only minimize the exposure of the banks to credit risk but will enhance profitability and competitiveness of the banks.*Rob Nijskens and Wolf Wagner (2011)*,

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A Study on Potential Individuals

P.Varaprasad Goud, Assistant Professor, School of Management Studies, Chaitanya Bharathi Institute of Technology, (Research Scholar, Osmania University)
Hyderabad, Telangana.

Abstract - This research paper gives an overview of the concept of potential Individuals. Organizations while operating in such a highly dynamic environment need those individuals who are capable of achieving tasks while working not only in the present role but also in any role assigned in the future. Therefore it is important to select the new recruits based on their potential besides looking into their knowledge, experience and other credentials. An attempt is being done to study the existing literature available on potential individuals and their qualities. This research paper recalls the definition of potential individuals and analyses the literature available on potential individuals.

Keywords: Potential, Employees, Characteristics

I. INTRODUCTION

Quiet recently, considerable attention has been paid to identifying potential individuals in the organizations. The cornerstone and the only differentiating asset of an Organization from its competitors are its employees. Besides, if such employees have a potential of achieving tasks if assigned in future (being more reliable and capable of doing something which is not being done now), it would be a great value addition to an Organization. The England Collins Cobuild dictionary has defined the term "Potential" as - Capable of being or becoming but not yet in existence; latent.

We use potential individual to say that someone or something is capable of developing into the particular kind of person or thing mentioned. If you say that someone or something has potential, you mean that they have the necessary abilities or qualities to become successful or useful in the future.

II. REVIEW OF LITERATURE

Key findings of the existing literature regarding Potential Individuals:

Much of the research and literature available focuses on HIPO's what is termed as High potential employees. Gritzmacher (1989) outlines nine characteristics of HIPO's including independent, committed, time conscious, high need for continuous improvement and creative. High potential (HIPO) employees, as defined by Schumacher (2009), are employees who produce excellent work performance consistently. HIPOs are the people who have the potential to assume higher positions in the future and they normally score well on various leadership assessment criteria (Schumacher, 2009). Derr (1987) notes that HIPOs are general managers who have the ability of climbing up the hierarchy ladder over a period of time and HIPOs become heads by the age of forty. A high-potential employee is one who has been identified as having the potential, ability, and aspiration to hold successive leadership positions in an organization (Bersin by Deloitte staff, n.d.).High-potential employees constitute the top 3-5 percent of a company's talent (Nikravan, 2011).

Findings of Lombardo and Eichinger (2000):

Lombardo and Eichinger (2000) in their research article " High Potentials as High Learners" discussed about derailment of individuals from their career and the characteristics of the learning agile. In their response to a study made by (McCall et al., 1988), on one of the Center for Creative Leadership studies which states that successful executives had a strong and similar pattern of learning from key job assignments, they argued that the derailed executives, all of whom had been successful for many years and had gone through many of the same key assignments as the successful executives, had virtually no pattern of learning from jobs. They stated that derailment is partly not learning new things. In a companion study (McCall and Lombardo, 1983), one of the key reasons cited for derailment was being blocked to new learning. According to organizational insiders interviewed, individuals quit learning assuming that they were legends and achieved enough in their career. They could not realise that they would be victimised by their own negative attitude towards learning new things. In their study on defining what a superior learner from experience (someone who is learning agile) looked like they had constructed four factors that describe different aspects of learning agility.

1) People Agility—Describes people who know themselves well, learn from experience, treat others constructively, are cool and resilient under the pressures of change.
2) Results Agility—Describes people who get results under tough conditions, inspire others to perform

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Recent Trends in Insurance Sector in India

Dr. Sowmya Kethi Reddi , Caroline Talari
School of Management Studies, Chaitanya Bharathi Institute Of Technology (CBIT),
Gandipet ,Hyderabad.
Email: chsowmyaramesh@gmail.com, caroline.talari@gmail.com

Abstract

Insurance is the key to success as it renders security to any organization or person. It is notable that insurance play vital role in economic development of nation. This article attempts to provide some facts regarding recent trends in insurance and effects of Govt. Policies on it. In insurance Privatization and entry of foreign players allows with establishment of IRDA. Competition in this context leads to innovative ideas due to globalization. Globalization in insurance increases the boulevard of customer centric products. Author depends on some research papers and other literature surveyed to identify Govt. policies role in insurance industry of India, further to learn about the concept and nature of insurance in economic development. The paper aims at providing suggestions and remedies to curbs the gap of insurance penetration in Indian market.

Keywords — Insurance, Privatization, IRDA, Economic Development and Govt. Policies.

I. INTRODUCTION

Risk is essentially an inevitable element of economic activities. Without risk, thinking of ahead would be futile. Covering of risk is necessary to enhance entrepreneurship and innovation for economic activities in young generation through business practices. Attentions of community and policy revision by Govt. of India put up insurance industries to customer centric market. Economic reform in country raises questions over infrastructure and security system of India against risk of natural and technical calamities. Globalization in industrialization insists restructuring of insurance with dynamic needs of big business. Policymakers of India careful about the demand of common person life and his property security; take measures to modify insurance scenario to offer better options. Life Insurance Corporation Act and General Insurance Business Act are the result of initial policies of independent India to popularize insurance industry with assistance of state. Insurance Regulatory and Development Authority (IRDA) becomes the landmark in history of Indian insurance industry for restructuring and reshuffling of old and outdated regulations of it. The IRDAs time-to-time advices to insurance companies to be competitive and to educate people about reimbursement of insurance through awareness program, advertisement and publications. It also play vital role in assembly transparency of industry with its routine supervision, auditing and controlling process. Competitive environments of industry itself create moral values in insurer for fair practice with ethical concerns. New-foreign and private players grow to be really conscious about brand value and goodwill to keep on for long lasting in market.

However, private players are not fully competitive with public sector companies. Private companies have lower advantages of Govt. Policies comparatively public sector due to subsidy and other financial assistance of state. Under this phenomenon, the variables like plans, policies, innovation, technology and subsidy become the key criteria for the insurance penetration in India.

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INNOVATIVE METHODS OF TEACHING

G.N.R. PRASAD
Associate Professor
Dept. of MCA, Chaitanya Bharthi Institute of Technology,
Gandipet, Hyderabad, Telangana, India
E-Mail : gnrp@cbit.ac.in

Abstract: *The purpose of this paper is to features of the traditional methods of teaching as well as e-teaching and to suggest other useful teaching methods that can be attempted in imparting knowledge to the students. Basically teaching must includes sharing of information. Finally, a teacher tries his best to impart knowledge as the way he understood it. So, any communication methods that serve this purpose without destroying the objective could be considered as innovative methods of teaching. The use of innovative methods in educational institutions has the potential not only to improve education, but also to empower people, strengthen governance and stimulate the effort to achieve the human development goal for the country.*

Keywords *: E-Teaching, Information Sharing;*

1. INTRODUCTION:

"Education is the manifestation of perfection already in man" – Swami Vivekananda

The biggest challenge any teacher faces is capturing the students' attention, and putting across ideas in such a way that it stays with them long after they have left the classroom. For this to happen, classroom experience should be redefined and innovative ideas that make teaching methods more effective should be implemented. The purpose of education is, let a student literate and to get a knowledge on the subject and also rational thinking[5].

The teaching nowadays must include innovative communication methods like playful games or forms of visual exercises that will excite the young minds and capture their interest, multimedia, the combination of various digital media types such as text, images, audio and video, into an integrated multi-sensory interactive application or presentation to convey information to an audience [1].

Education is vital to the pace of the social, political and economic development of any nation, so effective teaching is very essential. Effective teaching is important because teaching is based on helping children progress from one level to another in a more sociable interactive environment and to get the approach right to get students to be independent learners [2]. Effectiveness does not mean being perfect or giving a wonderful performance, but bringing out the best in students.

2. TRADITIONAL TEACHING METHOD:

In the eyes of reformers, traditional teacher-centered methods focused on rote learning and memorization must be abandoned in favor of student-centered and task-based approaches to learning. However, many parents and conservative citizens are concerned with the maintenance of objective educational standards based on testing, which favors a more traditional approach. Traditional education, also known as back-to-basics, conventional education or customary education, refers to long-established customs that society traditionally used in schools.

Some forms of education reform promote the adoption of progressive education practices, a more holistic approach which focuses on individual students' needs and self-control. In the eyes of reformers, traditional teacher-centered methods focused on rote learning and memorization must be abandoned in favor of student-centered and task-based approaches to learning. However, many parents and conservative citizens are concerned with the maintenance of objective educational standards based on testing, which favors a more traditional approach.