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

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IMPLEMENTATION OF IOT CONTROLLED PORTABLE COOLER USING RENEWABLE ENERGY

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Abstract

This paper proposes the idea of using Solar Energy as a source of power inr design and development of portable air cooler with longer life, less maintenance and better performance, particularly useful for rural areas that have a considerable amount of solar radiation and have no access to grid systems and also for street vendors during summer. This system comprises of a photovoltaic (PV) array along with battery to provide continuous power supply. The DC motor which is used in the traditional coolers is replaced with Permanent Magnet DC Motor. PMDC motor is highly efficient since no electrical energy is used or losses incurred for developing or maintaining motor's magnetic field. Its size is more compact, and a better dynamic performance can be expected due to higher magnetic flux density in air gap. PMDC motor has an essentially simplified construction, and it is maintenance free. In this system IOT control is used for switching of pump and to control speed of motor. The proposed air cooler system is designed to obtain satisfactory system performance.

Keywords: *IoT, Arduino UNO, Cooler, PMDC, Renewable Energy.*

1. Introduction [1]

In summer hot and humid conditions feel uncomfortable due to weather condition and heavy humidity. So, it's necessary to take care of thermal comfort conditions of human body. Thermal comfort is decided by the room's temperature, humidity, and air speed. Radiant heat having hot surfaces or radiant heat loss from cold surfaces also is important factor for thermal comfort. Relative humidity (RH) could also be a measure of the moisture within the air, compared to the potential saturation level.

Warmer air can hold more moisture. Once it approaches 100% humidity, the air moisture condenses – this is often called the saturation point. Room occupants also add heat to the space since the conventional blood heat is way beyond the space temperature. Need of such a source which is abundantly available in nature, which doesn't impose any bad effects on earth. There's just one thing which might come up with these all problems is solar power.

The rate of energy consumption is increasing very rapidly because of increase in population, industrialization, transportation etc. And also, the supply is depleting because of annihilation of fossil fuels, leading to inflation and energy shortage. This paved to explore other available renewable resources. Among all the renewable resources solar is most abundant and the effective harvest of this energy can easily fulfil present energy demand of world.

Though the extraction of energy from the sun might be costly, but with the reduction within the cost of power electronic devices and Solar panels in the recent years and their

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ALTERNATIVE APPROACHES FOR LABORATORY LEARNING AND ASSESSMENT IN ENGINEERING EDUCATION - OPEN SOURCE ALTERNATIVES

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ABSTRACT

Laboratory and practical work are characteristic features of an undergraduate degree program in any engineering discipline. Trying to incorporate practical work successfully in to the engineering curriculum can present a number of challenges. Laboratory and practical work are expensive to run, sometimes requiring specialist equipment to be purchased that can rapidly become obsolete. Despite the challenges, the application of theory in a practical setting remains an expected and fundamental part of the engineering curriculum. The challenge now is for program teams to consider how the knowledge, skills and attributes that we desire to develop through such practical activities, can be facilitated in an appropriate, effective and efficient way within an engineering degree program for the 21st century. The aim of this review paper is to summarize the literature available in the form of books, journal papers and articles

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Power Research

Performance Comparison of DSTATCOM with PI and PSO-PI Controller under Nonlinear Load Condition

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Abstract

The paper presents the compensation of harmonic, reactive power, dc voltage regulation and power factor improvement under nonlinear load condition is achieved by using Distribution Static Compensator (D-STATCOM). The synchronous reference frame control algorithm is developed for generating switching reference control signals. The dc link voltage is regulating with PI and PSO-PI controller. The attain control algorithm reference switching signals compared in hysteresis signal for better switching of D-STATCOM. The behaviour of DSTATCOM with PI and PSO-PI controller is also study and measure in terms of for DC link voltage, harmonic distortion, power factor correction and reactive power mitigation by using MATLAB/SIMULINK software.

Keywords: DSTATCOM, Harmonic Compensation, Non linear Load, PI Controller, PSO-PI Controller, Power Factor Synchronous Reference Frame Theory, Reactive Power

1. Introduction

In last one decade, power electronic devices are widely used in industrial applications for transferring power in more efficient way. The number use of power electronic equipments, such as nonlinear loads, in a distribution system has generated more problems in the quality of power such as harmonic pollutions and reactive power problems. Due to this low power factor, poor efficiency, overheating of motors and transformers, malfunction of sensitive devices etc[1–3]. These power quality issues are remunerated utilizing custom power devices, such as, distribution static compensators (DSTATCOM), Dynamic Voltage Restorer (DVR) and unified power quality conditioner (UPQC)[4,5]. In which the distribution static compensator is progressively reasonable for mitigation of reactive power, harmonic compensation, load unbalancing voltage and current sounds in the distribution arrange contrasted with other custom force devices[6–10]. The SRF control need PI controller for managing DC-interface voltage. The DC interface voltage of VSI is regularly constrained by using ordinary PI control procedure. In customary strategy got PI esteems are not pleasant. For this situation, by using PSO control program the got PI esteems are careful and keep up the consistent dc bus voltage when compare to the conventional PI controller. Here the Proportional and Integral estimations of the of PI controller for the DC interface voltage is constrained by using PSO program as compared to conventional PI control for better harmonic decrease and power factor upgrade[11–15].

The SRF controlled DSTATCOM is proposed and executed on 11/0.4kv distribution framework. The exhibition of the proposed DSTATCOM is examined under various load conditions as far as harmonic, reactive power mitigation and DC interface voltage regulations. The goals of this work are:

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ADAPTIVE NEURO FUZZY INFERENCE SYSTEM CONTROLLER FOR ISLANDED MICROGRID UNDER NONLINEAR LOAD CONDITIONS

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ABSTRACT

The main aim of this project is Adaptive neuro fuzzy inference system (ANFIS) controller for islanded microgrid under nonlinear balanced/unbalanced load conditions. This article introduces a new control scheme for the independent process of the microgrid containing of DG units for electronic coupling. The DG units are attached to a common connection point and provide supply to unbalanced and non-linear loads. In the field of system topology & constraints of the load is normally unknown. The current at load is assumed to be computable and minimal. Adaptive neuro fuzzy controller used for controlling the DG unit for better performance and reduces the THD of DG voltage. In the DGs the DC source replaced by PV source for balancing the load demand. The MATLAB results show that despite various unbalanced and nonlinear load conditions, the proposed controller provides a number of sinusoidal, three-phase, equilibrium voltages.

Key words: Distributed generation (DG), Adaptive neuro fuzzy inference system (ANFIS), PV, Nonlinear loads.

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Development and Testing of 2G High Temperature Superconducting (HTS) Field Coils for HTS Synchronous Machines

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Abstract

High temperature superconducting (HTS) synchronous machines are compact and light weight machines with higher torque to weight ratio, lower noise and better dynamic response for strategic and critical industrial applications. The development of HTS field coil is one of the main technological challenges in realizing the HTS synchronous machines, as it involves the selection of HTS tape, winding technology, handling of the HTS tape while winding on a winding machine and testing of the developed HTS coil at desired cryogenic temperatures. With advancements in HTS tape technology, recent 2G HTS tapes are offered with

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Performance evaluation of different structures of power system stabilizers

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ABSTRACT

The electric power from the system should be reliable and economical for consumer's equipment satisfaction. An electric power system consists of many generators, transformers, transmission lines, loads, etc. For the power system network, dynamic performance and stability are important. The system is lost its stability by some disturbances i.e., load variations, generator failure, prime mover failure, transmission line outage, etc. Whenever load variations in the system, generator rotor speed will vary, means oscillations in the rotor speed, which is deviating from rated speed. The excitation system will control the generator rated line voltage. When fault occurs at any equipment in the system, the system will unstable. If fault occurs at generator, the generator oscillates. To reduce the oscillations and to make the system stable used power system stabilizers (PSS's). Here, three types of PSS's are used i.e., PSS1B, PSS2B, PSS4B. Comparisons of three PSS's are on the multi machine system under some disturbance. From the observations, concluding that PSS4B is quickly control the oscillations in the physical parameters of machine in the system than other power system stabilizers.

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1. INTRODUCTION

Modern power system is interconnected with multiple machines, transformers, transmissionlines, loads. The supply should be reliable and economical electric energy is major requirement of industrial progress and consequent rise in the standard of living. The frequency and voltage should be held within allowable tolerances to satisfy consumer's equipment operation. With Deregulation of power supply system, Power transmitting to various places wherever it is required. Here, dynamic performance and stability are important. The system lost its stability under certain faults i.e.,generator failure, prime mover failure, transmission line outage, load variations, etc.These disturbances affect the power system variables such as frequency and voltage this leads to instability of the system. The stability is defined as when a disturbance occurs in the electric power system, the system regains its original state after the disturbance [1, 2]. The stability problem is related with the behavior of the synchronous machines under disturbed conditions. When the system changes its operating point from one stable point to the other, it is mandatory that all interconnected synchronous machines should remain in synchronism. i.e., machines should connect in parallel with same speed [3]. In [4] this, proposed new polymorphic bacterial chemotaxis optimization

A NOVEL POWER QUALITY CONDITIONER WITH UPQC

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Abstract: *The power demand is rising rapidly. The major issue in supplying the power to larger areas is power quality. The power electronic devices are major source of harmonics. So here we propose Unified Power Quality Conditioner (UPQC) for the elimination of harmonics and supply quality power. The UPQC is both series active filter and shunt active filter combination. It eliminates both the voltage related problems and current related problems. This is connected between load and the source. Sensors sense the source voltage and source current, load current and load voltage. The compensating voltage and currents are injected into the line based on the sensed values and reference signal generated by synchronous dq reference frame theory (DQ theory) and instantaneous reactive power theory (PQ theory). As nonlinear loads inject harmonics into the supply, voltage sag, swell, harmonics, flicker etc. are generated which are not likely for an effective power supply. Here we control the voltage sag and swell using UPQC with PQ and DQ theory for reference signal generation. It moves us another step ahead towards a quality power supply to the consumers.*

Keywords: **unified power quality conditioner, active power filters, voltage sag and harmonics**

1. INTRODUCTION

Unified power quality conditioner (UPQC) was proposed to improve the power system condition and has gone through many modifications to improve the performance [1]. Basically, UPQC has been employed successfully to mitigate or suppress various power quality (PQ) issues like voltage sag/swell, voltage flicker, voltage harmonics, voltage fluctuations, poor power factor, unbalanced voltages and currents, harmonics in load current, reactive current and neutral current[2-3]. Research on UPQC has increased tremendously over the last decade in areas like the type of the UPQC converter (CSC or VSC), supply system (single-phase and three-phase), and configuration of UPQC topologies [4-5]. All the above power quality issues cannot be solved in one topology configuration, but based each issue priority, they can be dealt accordingly.

The APFs (active power filters), such as series APF, shunt APF and hybrid APFs are widely used to mitigate the power quality related problems [2]. The UPQC is a flexible device that can be able to compensate critical problems related to power quality which includes current and voltage problems.

The unified power quality conditioner (UPQC), also known as universal filter, is the most precise hybrid filter design. UPQC is a multi-role power conditioner which is shunt and series active filter combination that is connected in cascade through DC link capacitor that is used to compensate various disturbances of power supply, to correct fluctuations in voltage, and to prevent the load current harmonics entering the power system.

It is a traditional and widely acceptable power device designed to suppress the disturbances affect the performance of sensitive and critical loads. UPQC has series and shunt compensation abilities for reactive power, harmonics, and power-flow control and voltage disturbances. UPQC comprises of two voltage-source inverters connected through DC link designed in three-phase three-wire, single phase or three-phase four-wire topologies.

SINGLE OBJECTIVE POWER FLOW PROBLEM ANALYSIS USING HCSA WITH IPFC

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Abstract: *Optimal Power Flow (OPF) with Interline Power Flow Control (IPFC) device place an important role in power systems. In this the modeling of IPFC device and location of IPFC device are discussed in this paper. A proposed NDSHCSA algorithm for multi-objective optimal power flow problem with IPFC with different stated objective functions are discussed. In the proposed algorithm Fuzzy toll is used to find the best Pareto front solution. The results are showing better when compared to existing literature.*

Keywords: **Optimal power flow, IPFC, Hybrid cuckoo search algorithm, cost, loss and emission**

1. INTRODUCTION

Now a day's growing in demand for electricity, due to increase in utility of electrical energy in various modes that leads operation of power system become difficult task. A recent development in power electronic technology with FACTS device is described in [1-3]. The modeling of UPFC is described in [4-7]. Power flow control in single transmission line UPFC is used and for multiline power flow control IPFC is used. The voltage source converter is described in [8]. Further, on observation it is revealed that the PIM of FACTS devices are described in [9-10]. In [11], the IPFC is a successful power flow control of multi-line systems. In this reference explained the basic operation of IPFC. Modeling of IPFC and execution in Newton method is described in [12]. In [13] proposed OPF method with IPFC to solve load flow problem with minimizing generation fuel cost. Real power loss minimization in power system was developed by Jun Zhang and Akihiko Yokoyama [14]. In [15], describes a PIM of IPFC for power flow analysis by considering the transformer impedance and the line charging susceptance. In [16], the PSO, GA and SA optimization techniques are used to optimize the total power loss in the network with IPFC. A current based model of IPFC has developed by Vinkovic A and Mihalic R [17] In the above literature, reveals that all the FACTS devices incorporated for power flow management of single transmission line. But this chapter describes the performance of a multi-line FACTS device which is IPFC. Numerical analysis is carried out with sundered test systems on IEEE-14 bus.

2. POWER INJECTION MODEL OF IPFC

IPFC is the versatile member of FACTS controller used in power flow management of multiple transmission lines of a power system network. IPFC model consists of number of DC-AC converters. These converters provide series compensation for the lines. IPFC consists of number of SSSC's but for simplicity IPFC represents two back-to-back DC-AC converters in series with two transmission lines through coupling transformer. The basic diagram of IPFC is shown in Figure 1 In this way IPFC can be supply real power to DC link for its transmission line.

DEEP LEARNING BASED OPTIMAL DC MICROGRID SYSTEM WITH IRNSS SYNCHRONIZATION

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Abstract*: Distributed Generators are gaining significant importance in bridging the gap between limited generation capacities and steeply increasing demands. Thirst for energy is increasing significantly with increase in economy around the world and burdening the conventional grid (CG). Major objective of this research is to reduce the peak power deficit present in CG system and to provide a reliable power supply even in case of grid failure or during blackout. In this proposal, development and evaluation of a small scale grid interactive dc microgrid for residential houses has been proposed. A comprehensive power flow control strategy is explored for different practical scenarios through Simulink model have been developed. A prototype will be developed to validate the simulation results presented during grid connected and isolated mode. An IRNSS -based scheme is used to synchronize the DGs. GPS-based synchronization method is proposed to generate a common time reference to synchronize distributed generation modules. Deep Learning Optimization Technique is used for optimal production and consumption.*

Keywords: DC Micro grid, Deep learning, IRNSS, Synchronization, Solar, Wind, Energy management system

1. INTRODUCTION

The University of Wisconsin established a small laboratory microgrid with a capacity of 80 kVA. 7.2 kV microgrid build in Mad River Park, Vermont, USA. Multiple demonstration projects were successively built all over the world, including Japan's Sendai system (2004), Shimizu Microgrid (2005), Tokyo Gas Microgrid (2006), Spain's Labein Microgrid (2005), USA's Sandia National Laboratories (2005) and Palmdale's Clear well Pumping Station (2006); and Germany's Manheim Microgrid (2006). The concepts of DC microgrid are originated in US. The architecture proposed by CERTS consists of power electronic technologies-based micro sources with a capacity of 500kW. In 2003 the goal for grid modernization is set in US to widely integrate IT and communication technologies into power systems to achieve grid smartness. In view of grid modernization the focus of the US future microgrid is to improve reliability for critical loads, meeting various customized quality demands, minimizing the cost, and realizing smartness. Considering market demands, power supply security, and environmental protection, the European Union (EU) proposed the "Smart Power Networks" program in 2005 [1]. residential lighting and even some communication systems failed to operate [2]. India stood at third place in producing electricity around the globe, still it is having power deficiency, over the coming years demand for power rises as economy because of strong correlation between them [3]. The design methodology and technical specifications of the PV power plant are discussed below [4]. The inverter must be large enough to handle the total peak watt requirement of the zone at any time. The inverter size should be 25–30% bigger [5] than the total wattage of the appliances and machines

Multi-objective optimal power flow using NSGSA with IPFC

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Abstract: *Power demand increasing rapidly after 19th century. To meet this demand power generation must increase or existing transmission lines performance must improve. Installation of power plant costly manner hence in this paper performance of the transmission lines must improve using IPFC device. One of the important and latest FACTS device is Interline power flow controller (IPFC) is used to improve performance of the transmission line in terms of stated objective functions such as cost, emission and loss minimization. In this proposed Non dominated Sorting Gravitational Search Algorithm is used to solve multi objective optimization problem. The proposed stated objective functions are optimized for IEEE 14 bus system in the presence of IPFC. The results are compared with existing literature and shows proposed algorithm gives better result when compare to existing algorithms.*

Keywords: **Optimal power flow, Multi-object, Non-dominate sorting, Pareto front, Gravitational search algorithm**

1. INTRODUCTION

Latest development in Semiconductor devices and its advantages in transmission systems necessitates new generation of FACTS devices like SSSC, IPFC and other devices. In [1] described different modes of operation of SSSC. With the practical applications of converter-based FACTS controller synchronous series compensator is great impact in power system operation [2]. In [3] presented a PIM of SSSC for load flow analysis. D.Menniti, et al. proposed a method for optimal location of SSSC [4]. Suman Bhowmick, et al. given an indirect modelling approach for SSSC is proposed for Newton power flow analysis [5]. In [6], incorporates the SSSC in OPF solutions to improve the operation of the systems. A recent development in power electronic technology with FACTS device is described in [7-9]. The modelling of UPFC is described in [10-13]. Power flow control in single transmission line UPFC is used and for multi-line power flow control IPFC is used. The voltage source converter is described in [14].

2. Objective functions

The OPF problem can be represented as follows:

$$\text{Min } [A_m(x,u)]; \qquad \forall m = 1,2,....,J \tag{1}$$

$$\text{Subjected to the constraint } g(x,u) = 0 \tag{2}$$

$$h_{\min} \le h(x,u) \le h_{\max} \tag{3}$$

POWER QUALITY IMPROVEMENT USING FUZZY LOGIC CONTROLLER BASED UPQC

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Abstract: *The importance of quality in power supplied to consumers is increasing as the days are passing due to increase in demand of power .As a solution to this the new control technique that is Unified Power Quality Conditioner (UPQC) with fuzzy logic controller for mitigating harmonics and voltage sag in the distribution system considering for the improvement of power. The UPQC is the power electronic module that guarantees for the better power quality because it contains both the shunt-active and the series-active power filters (APFs). Fuzzy logic controller attracted the significant deal of recognition and also possesses conceptually for the quality of the simplicity by tackling the complex systems with the ambiguity. In this study, for generating of the reference signal for controlling the UPQC the fuzzy logic controller has been utilized. MATLAB/Simulink is used for the simulation study and is carried out for the investigation and demonstration of the behavior of fuzzy logic controller that is proposed, in terms of the performance in improving for the power quality is by reducing the harmonics, voltage sag and voltage swell.*

Keywords: **fuzzy logic controller, voltage sag, voltage swell, harmonics and power quality.**

1. INTRODUCTION

Power quality is challenging issue our daily life. The word power quality became one of most prolific buzzwords since late 1980s in power industry [1]. As consumer's requirement is increasing daily, the quality of power supply should also be improved accordingly. The both electric utilities and the end users of the electric power are then becoming increasingly concerned regarding the quality of the electric power. In the recent years, development of the power electronics devices was been led for implementation of the electronic equipment that is suitable for the electrical power systems. Non-linear loads produce the reactive power and the harmonics related problems in utility systems. Harmonic and the reactive power cause the poor power factor also distort supply voltage at customer service point. Presence of the harmonics in the power lines raise to increased power losses in distribution system, the interference problems in the communication systems and, then sometimes, in the operation failures of the electronic equipments, that are more sensitive as they include the microelectronic control systems, that work with the low energy levels. Due to these problems, issue of power quality that is delivered to end consumers is the, more than ever, the object of the great concern. As to control the power quality problems, the many standards are been proposed by the different agencies, as IEEE-519 standard [1-2]. Ideally, the voltage and the current waveforms in phase, power factor of the load equals to the unity, and reactive power consumption zero. The situation enables most efficient transport to active power, leading attainment of cheapest distribution system. During past, solutions to the mitigation as the fixed compensation, the resonance with source impedance, and the difficulty in the tuning time dependence filter parameters, identified the power quality problems are through the conventional passive filters. Their limitations, have ignited need for the active and the hybrid filters [2-3]. In this circumstance, the new technology called as the Custom Power Devices (CPDs) is emerged in the distribution sector that the power quality can significantly be improved.

UPQC is the custom power device which is employed in distribution system for mitigating disturbances that affect performance of the sensitive and/or the critical load [4-5]. Function of the UPQC is to compensate the supply voltage imbalance/flicker, the reactive power, harmonics and the negative sequence current. In the other words, UPQC

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Research Article

Modeling and Simulation of Feedback based Linear Electromechanical actuator

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Abstract: An actuator is a device that which provides control over certain automation systems and also provides tuning in movement or positioning in various applications like manufacture of valves, motor, wastewater treatment plants, onboard electronics based on the type of configuration of type of actuators. Out of the available types of actuators, linear Electro Mechanical Actuators (EMA) is a powerful and advanced tool which provides optimal solution for the field of automation, various applications where high speed, high precision with control are required. This paper proposes to have velocity feedback system to entire function of EMA's in order to improve its functionality, and this enhances the efficiency. This paper also proposes modeling and simulation of normal conventional linear Electro Mechanical Actuator and velocity feedback controlled EMA and compares the results in MATLAB/SIMULINK.

Keywords: control systems, Electro mechanical actuator (EMA), Feedback systems, and Velocity feedback systems.

1. Introduction

In the field of control system engineering and automation, actuators play a key role in positioning and controlling of systems. Though there are different types of actuators like hydraulic, pneumatic, electro hydraulic, an extensive based application of novel, and optimized electric actuators such as Electro Mechanical Actuators (EMA) (Bertula, 2020) are preferred due to its various advantages like, overall weight is reduced, maintenance is simplified, which is often contaminant, flammable or polluting, can be eliminated. Of course, these types and configurations of actuators definitely gets changed based on its features like output torque, maximum holding force, maximum speed, ration of protection, size and type of application required.

An Electro Mechanical Actuator is a device which converts electrical energy or force into mechanical unit like kinetic energy in the form of either linear or rotary motion. Basically, the subsystem of an EMA includes power electronic circuitry, intelligent controller, an BLDC drive, ball screw mechanism for position detection, and its associated components. An intelligent controller is a PD Controller connected with feedback loop (Bennouna .O, 2013), and gives a signal comparing positional feedback signal with the reference one. A power electronic circuitry consists of conventional three phase inverter after detailed investigation on various configurations. The most critical component here is an electric drive which is a Brushless DC motor (BLDC). As BLDC is economical and has no maintenance cost like replacement of brushes, no sparking problems and less scope of commutation. So, BLDC is mostly preferred in many of the actuators due to its robustness. Choosing of this drive is important and depends upon the specific application such as stepper motor is preferred in the applications like instrumentation of robotics, laser equipment and for better accuracy. Similarly, Induction motor is chosen where accuracy and high resolution is required such as refinery process. A dc brushless motor is preferred in the flight control systems, aviation, navigation purposes. In this paper, a normalized dc motor (Garikapati, P, 2020) is taken into account as it is simple for the sake of analysis purposes, tuning of motor parameters gives clear illustration in the SIMULINK.

2. Feedback based Electromechanical actuator

The most important parameters in EMA are desired frequency response, stability and phase lag control. The controller is PD controller as this type of controller is enough to explain the feedback system. Anyhow, if PID controller is taken, the tuning parameter of integral parameter becomes
bit difficult and not recommended if this linear EMA is extended to various applications like ship propulsion systems, air flight control systems. A PD controller is preferred after investigation of different controllers and its tuning parameters. Generally, most of the EMA does not include any feedback systems except positional feedback due to the consequences in the sizing of actuator and its nozzle. The feedbacks (Ivana Todinc 2013; Latchouni, 2018) to the control electric drives may be position closed loop control for tuning damping forces to improve desired frequency response of actuation system, differential pressure feedback, which is mostly used in the electro hydraulic actuators to avoid vibration level. A gear has capability to decrease the motor angular speed (RPM) and increase its torque to desired values. A network of sensors used to close the feedback rings (current, angular speed and position) that control the whole actuation system.

Lithium-Ion Battery: Charging & Discharging Modes

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***Abstract*---Lithium Ion batteries are currently the dominant battery technology and have been widely developed in the portable electronics market. In the recent years the energy density of Lithium Ion batteries has increased to two to three times. High efficiencies, a long cycle life, high energy density and high power density are the desirable characteristics of Lithium Ion Batteries. Along with these characteristics the capability for fast discharge, have made them nearly ideal for portable electronic applications. As the charging and discharging current ratio has an important influence on the charging and discharging characteristics of the lithium ion battery pack, the research on it can provide the basis for the calculation of SOC and the safe use of the lithium battery. In this paper charging and discharging characteristics of a lithium ion battery is studied by the use of a matlab model and the results are examined.**

Keywords--- Lithium Ion Battery, SOC, C-rate, Matlab.

I. INTRODUCTION

Li-ion batteries offer an excellent level of performance. To gain the best from them, they must be charged correctly. The battery operation can be impaired if the and they can even be destroyed if the battery charging is not done in a proper manner – So care must be taken.

Proper charging of Li-ion batteries enables the best performance and longest operational life to be obtained. As a result, Li-ion battery charging is normally undertaken in conjunction with a battery management system. This controls the level of charge, discharge and the rates at which these can occur.

In very basic terms, the charge and discharge of a lithium-ion battery is relatively easy to explain. When the lithium-ion cell or battery is discharging it provides current to an external circuit. Internally the anode releases lithium ions in an oxidation process which pass to the cathode. This process releases the chemical energy that is stored in the cell in the form of electrical energy.

During the charging cycle, the reactions occur in the reverse direction with lithium ions passing from the cathode through the electrolyte to the anode. The electrons provided by the external circuit then combine with the lithium ions to provide the stored electrical energy.

It should be remembered that the charging process is not totally efficient - some energy is lost as heat, although efficiency levels of around 95% or a little less are typical.

Charging and discharging batteries is a chemical reaction, but Li-ion is claimed to be the exception. The Li ion charger is a voltage-limiting device that has similarities to the lead acid system. The differences with

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PERFORMANCE COMPARISON OF BLDC MOTOR BASED ON CONVENTIONAL AND EXPERT CONTROLLERS

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ABSTRACT

BLDC motors are the compatible motors in EV's now-a-days for their feasibility, high efficiency, high power density and reliability. To obtain superior drive characteristics different speed control techniques are adopted. The speed control of BLDC motor is done using various control strategies using PWM, sensor less speed control and Sensor based speed control. PI and PID controllers are immensely used for the control of speed in BLDC motors. The performances of BLDC motor have been evaluated using conventional controllers PI and PID. In order improve dynamic characteristics and to obtain smooth, quick response Fuzzy logic based intelligent Fuzzy-PID controller can replace conventional PI and PID controllers. This paper

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MODELLING AND DEVELOPMENT OF CONTROLLER FOR BLDC MOTOR

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ABSTRACT

Now-a-days Brush Less DC (BLDC) motors are extensively used in industrial applications because of their simplicity, feasibility and high-power density. Generally, DC motors dominate their use in various position control plants but they need periodical brush and commutator maintenance. Hence BLDC motors are used as they have electronic commutation. The BLDC motor speed control is done using different techniques using PWM, sensor less speed control. Different controllers are used for the speed control of BLDC motor. Most widely used controllers are PI and PID. This paper will discuss about the Electrical characteristic modelling of BLDC motor. This paper demonstrates MATLAB/Simulink model for speed control of BLDC motor using Ziegler-Nichol's method for tuning PID controller.

A New Hybrid Control Scheme for Seven-level Asymmetric Cascaded H-bridge Multilevel Inverter

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Abstract

This paper presents a new Hybrid Control Scheme for seven-level Asymmetric Cascaded H-Bridge (ACHB) Multilevel Inverter topology. For getting low harmonic distortion and medium voltage operation, two H-bridge cells are connected in cascaded manner with 1:2 stiff dc source configurations. It possess only eight unidirectional switches and two isolated dc sources for generating seven level output thereby the requirement of gate driver circuits, protection circuits have been reduced as compared with symmetric source configuration of 7-level ACHB Inverter. The proposed control scheme provides less switching losses since few switches are operating with fundamental switching frequency and also gives less harmonic distortion as compared with conventional high frequency carrier based Pulse Width Modulating (PWM) schemes. With this control scheme, there are two different modulating signals have been utilized for generating switching pulses to the inverter. The complete operation of ACHB Inverter and feasibility of proposed control scheme have been validated through MATLAB/Simulink platform.

Keywords ***: Asymmetric Cascaded H-Bridge, Multilevel Inverter, Hybrid Pulse Width Modulation, High Frequency Carrier, Switching loss.***

I. Introduction:

In present scenario, there is a need to develop better power converters in order to save or generate electrical energy either conventionally or non-conventionally.[1] Conventional H- bridge inverter gives the average output voltage as the reference with high amount of losses[2]-[3]. This drawback of conventional Inverters is overcome with the existence of Multilevel Inverters (MLI). These are designed to generate a desired output voltage from several input DC sources. MLI with higher output voltage levels gives the better quality of the output voltage [2,4]. The basic classification of Multilevel Inverter are shown in Fig.1 [5]–[7].

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Enhanced Marine Predators Algorithm for identifying static and dynamic Photovoltaic models parameters

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Highlights

- A novel enhanced MPA algorithm has been proposed for effective PV modelling.
- Static and dynamic PV model parameters have been estimated.
- The estimated parameters have been validated via experimental data-sets.
- The statistical analysis has been performed for effectiveness of the EMPA method.
- The results confirm the EMPA efficiency comparing with state-of-the-art algorithms.

Abstract

Providing an accurate and precise photovoltaic model is a vital stage prior to the system design, therefore, this paper proposes a novel algorithm, enhanced marine predators algorithm (EMPA), to identify the unknown parameters for different photovoltaic (PV) models including the static PV models (single-diode and double-diode) and dynamic PV model. In the proposed EMPA, the differential evolution operator (DE) is incorporated into the original marine predators algorithm (MPA) to achieve stable, and reliable performance while handling that nonlinear optimization problem of PV modeling. Three different real datasets are used to show the effectiveness of the proposed algorithm. In the first case study, the proposed algorithm is used to identify the unknown parameters of a single-diode and double-diode PV models. The root-mean-square error (RMSE) and standard deviation (STD) values for a single-diode are $\mathbf{7.7301e^{-04}}$ and $\mathbf{5.9135e^{-07}}$. Similarly for double diode are $\mathbf{7.4396e^{-04}}$ and $\mathbf{3.1849e^{-05}}$, respectively. In addition, the second case study is used to test the proposed model in identifying the unknown parameters of a double-diode PV model. Here, the proposed algorithm is compared with classical MPA in five scenarios at different operating conditions. In this case study, the RMSE and STD of the proposed algorithm are less than that obtained by the MPA algorithm. Moreover, the third case study is utilized to test the ability of the proposed model in identifying the parameters of a dynamic PV model. In this case study, the performance of the proposed algorithm is compared with the one obtained by MAP and heterogeneous comprehensive learning particle swarm optimization (HCLPSO) algorithms in terms of RMSE $\pm$ STD. The obtained value of RMSE $\pm$ STD by the proposed algorithm is $\mathbf{0.0084505 \pm 1.0971e-17}$, which is too small compared with that obtained by MPA and HCLPSO algorithms ($\mathbf{0.0084505 \pm 9.6235e-14}$ and $\mathbf{0.0084505 \pm 2.5235e-9}$). The results show the proposed model's superiority over the MPA and other recent proposed algorithms in data fitting, convergence rate, stability, and consistency. Therefore, the proposed algorithm can be

Field Oriented Control for Induction Motor in Electric Vehicle Applications

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Abstract— The Induction motors are highly preferred for Electrical Vehicle (EV) applications due to its simple design, ruggedness, and easy maintenance. Control schemes that are addressing for induction motor are complex as the motor is a complicated nonlinear system. For an induction motor, the physical parameters could change in different operating conditions. Therefore, the control of induction motor parameters becomes critical in the applications where a good transient and steady state speed performances are required. In this paper, a new Field oriented control (FOC) on Induction motor control is discussed. Main objective of the paper is to design and simulate an induction motor using field-oriented control for electrical vehicle applications. For this control, the reference speed signal is developed by considering different driving profiles like cruising at constant speed, cruising at maximum speed, retardation and complete driving profile in a MATLAB/Simulink environment.

Index Terms— Induction motor control, Field-orientation control (FOC), Vector control, Transient and Steady state responses.

I. INTRODUCTION

In the automotive industry, the development of internal combustion engine vehicles is one of the greatest achievements [1]. Automobiles have made significant contributions to the advancement of modern technology and the economy by meeting many of our daily transportation needs. However, the larger usage of automobiles all around the world has resulted in major environmental and human health issues. Air pollution, global warming, and the rapid depletion of the world's petroleum reserves have all become major issues. Environmental concerns and the oil crisis prompted the need for clean, efficient transportation options. The automotive industry began research and development initiatives for the development of clean, zero-emission, and high-efficiency transportation in the last several decades. As a result, electric vehicles (EVs) are becoming increasingly popular and are beginning to supplant traditional automobiles [1]. Because of its low emissions and high efficiency, the electric automobile is the preferred choice.

Induction motors (IM) are better choice for electric vehicle applications as they can run at a nearly constant speed from zero to full load in comparison to traditional traction motors [2]. Three-phase induction motors are durable, low-cost to produce, and easy to maintain. The control of IM is more complicated than that of DC motors, but the advent of powerful digital computers has reduced in managing this complexity.

Around 1970, vector control approaches began to emerge. A few different types of vector control are discussed, including rotor flux oriented, stator flux oriented, and mutual flux oriented. They are all subjected to simulate an independently excited DC motor, in which the electromagnetic torque and magnetic field can be regulated individually, regardless of the type of vector control [1-3].

Field oriented control (FOC) helps to control both the field-producing and torque-producing currents in a decoupled method. Different flux orientations are utilized for different applications. The rotor flux-oriented control, on the other hand, achieves a completely decoupled system. The rotor flux-oriented type of vector control is referred to as field-oriented control. In addition, depending on how the rotor flux orientation is obtained, field-oriented control can be characterized as indirect or direct field-oriented control [1-4]. By putting a hall-effect sensor within the induction motor, the direct FOC obtains the mutual flux's orientation. However, because specific modifications are required to position the flux sensors, using these types of sensors is costly and unpleasant.

Furthermore, because measuring the rotor flux is impossible, we must directly feel the mutual flux and then calculate the rotor flux information. The indirect FOC, on the other hand, is dependent on predicting the rotor flux orientation [5-8].The rotor flux orientation can be calculated using motor state equations and signals from the motor terminals such as three phase currents and rotor rotation speed. Even though indirect FOC does not have the same issues as direct FOC, it is commonly used in most applications [5-8].

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Power System Resiliency and Wide Area Control Employing Deep Learning Algorithm

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Abstract: The power transfer capability of the smart transmission grid-connected networks needs to be reduced by inter-area oscillations. Due to the fact that inter-area modes of oscillations detain and make instability of power transmission networks. This fact is more noticeable in smart grid-connected systems. The smart grid infrastructure has more renewable energy resources installed for its operation. To overcome this problem, a deep learning wide-area controller is proposed for real-time parameter control and smart power grid resilience on oscillations inter-area modes. The proposed Deep Wide Area Controller (DWAC) uses the Deep Belief Network (DBN). The network weights are updated based on real-time data from Phasor measurement units. Resilience assessment based on failure probability, financial impact, and time-series data in grid failure management determine the norm $\mathcal{H}_2$. To demonstrate the effectiveness of the proposed framework, a time-domain simulation case study based on the IEEE-39 bus system was performed. For a one-channel attack on the test system, the resiliency index increased to 0.962, and inter-area damping ξ was reduced to 0.005. The obtained results validate the proposed deep learning algorithm's efficiency on damping inter-area and local oscillation on the 2-channel attack as well. Results also offer robust management of power system resilience and timely control of the operating conditions.

Keywords: Neural network; deep learning algorithm; low-frequency oscillation; resiliency assessment; smart grid; wide-area control

1 Introduction

Power System Stabilizer (PSS) focuses only on damping local oscillation by generator excitation control [1]. However modern power is highly affected by both local and inter-area oscillations. This instability is further increased by demand-side energy management and distributed energy

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Efficient fractional-order modified Harris hawks optimizer for proton exchange membrane fuel cell modeling

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Abstract

An effective harmony between the exploration and exploitation phases in meta-heuristics is an essential design consideration to provide reliable performance on a wide range of optimization problems. This paper proposes a novel approach to enhance the exploratory behavior of the Harris hawks optimizer (HHO) based on the fractional calculus (FOC) memory concept. In the proposed variant of the HHO, a hawk moves with a fractional-order velocity, and the rabbit escaping energy is adaptively tuned based on FOC parameters to avoid premature convergence. As a result, the fractional-order modified Harris hawks optimizer (FMHHO) is proposed. The sensitivity of the algorithm performance vis-a-vis the FOC parameters is addressed, and the best variant is recommended based on twenty-three benchmarks. For validating the quality of the proposed variant, twenty-eight benchmarks of CEC2017 are tested. For evaluating the proposed variant against the other present-day techniques, several statistical measures and non-parametric tests are performed. Moreover, to demonstrate the applicability of the proposed technique, the proton exchange membrane fuel cell (PEMFC) model parameters estimation process is handled based on several measured datasets. In this series of experiments, the FMHHO variant is compared with the standard HHO and the other techniques based on intensive statistical metrics, mean convergence curves, and dataset fitting. The overall outcome shows that the FOC memory property improves the performance of the classical HHO and leads to accurate and robust solutions fitting the measured data.

Previous Next

Keywords

Fractional-order modified HHO; Whale Optimization Algorithm; Particle Swarm Optimization; Harris hawks optimization; Salp Swarm Algorithm; Parameters estimation; Grey Wolf Optimizer; Fractional calculus; Genetic Algorithm; Optimization; Fuel cell

Nomenclature

Acronyms

ABC
: Artificial bee colony

ALPSOFV
: Augmented Lagrangian particle swarm optimization with fractional-order velocity

BA
: Bat optimization

CoDE
: Differential evolution with composite trial vector generation strategies and control parameters

CS

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Self-Controlled PMSM Drive Employed in Light Electric Vehicle-Dynamic Strategy and Performance Optimization

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ABSTRACT This proposed work demonstrates the illustration of dynamic performance intensification of a Permanent Magnet Synchronous Motor (PMSM) employed by a PWM controlled inverter which synchronizes with the rotor movement intimation. PMSM are widely hired in electric vehicles since it possesses better dynamic response, improved torque-speed property, and reduced noise, energy-efficient and power factor in comparison with traditional motors. In the present work, it is observed that by few modifications of the position control strategy as good as sinusoidal stator currents response generates less torque ripples. The mathematical model for PMSM is derived from park's transformation. Further, a maiden attempt is taken to introduce the performance indicator 'sensor angle' to estimate the rotor position in this strategy. From the established model, the various dynamic behavior of the drive system is determined analytically without and under various load disturbances. Additionally, a particle swarm optimization (PSO) technique is adopted to optimize the performance of the proposed dynamic strategy. An efficient speed control strategy by the variation of DC bus voltage is achieved which is equivalent to the armature voltage control of the conventional dc machine. Further, efficient and simple control circuitry of the voltage source inverter (VSI) is obtained in this strategy. To verify the efficacy of the proposed algorithm, necessary tests are carried out in a real-time setup. Therefore, an improved control strategy obtained from the simulation and an experimental approach meets the dynamic behavior employed in light weight electric vehicles.

INDEX TERMS Dynamic response, light vehicle, permanent magnet synchronous motor, rotor position, pulse width modulation (PWM), speed control.

I. INTRODUCTION

Since the progress of permanent magnet materials, modern power electronics and the sophisticated control technique including semiconductor fabrication technology PMSM Motors are significantly appointed in different industrial, commercial and indifferent domestic applications. Light electric vehicles are currently designed to gain lower automobile emissions. The electric motors are used in electric vehicles require better torque-speed characteristics to obtain higher operating range and improved efficiency. Generally, the characteristics of flux density distribution in the air gap and the back emf produced in the armature winding supplied by permanent magnets exhibit sinusoidal characteristics [1], [2].

The typical speed control procedures of this kind of machine could be incorporated in a method equivalent to a traditional DC machine-either by the variation DC link

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A Recurrent Reward Based Learning Technique for Secure Neighbor Selection in Mobile AD-HOC Networks

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ABSTRACT Mobile ad-hoc network is an assortment of distinct attribute-based mobile devices that are autonomous and are cooperative in establishing communication. These nodes exploit wireless links for communication that causes injection of the adversaries in the network. Therefore, detection and mitigation of adversaries and anomalies in the network are mandatory to retain its performance. To strengthen this concept, in this article, a novel secure neighbor selection technique using recurrent reward-based learning is introduced. This proposed technique inherits the benefits of conventional routing and intelligent machine learning paradigm for classifying the states of the nodes based on their communication behavior. Thorough learning of the behavior of the nodes unanimously at all the hop-levels of communication enables establishing secure and consistent routing and transmission paths to the destination. The performance of the proposed technique is estimated using the metrics throughput, packet delivery ratio, and delay and detection ratio. Experimental analysis proves the consistency of the proposed technique by improving throughput, packet delivery ratio, and detection ratio under less delay.

INDEX TERMS Attack detection, behavior modeling, machine learning, MANET, reward function.

I. INTRODUCTION

Research focus over mobile ad-hoc networks (MANETs) has increased significantly in the present years due to its on-demand communication and infrastructure-less configuration abilities. MANETs consist of mobile self-disciplined mobile nodes (such as electronic devices with a communication unit, mobile phones, wireless sensors, etc.) that interconnect using intrinsic routing ability. For communication and packet data exchange, the nodes establish wireless links by discovering reliable neighbors. The nodes are capable of transmitting data packets to the destinations located away from its radio range. In such cases, to scale the physical transmission distance, the sender banks on intermediate nodes. The intermediary nodes are the same as that of the sender act as a hub/ relay to forwarding packets. The intermediary node receives the information from the sender and forwards it to the neighbor connecting the destination. The source forms transmission routes using the discovered neighbors. Neighbor discovery, path monitoring and preservation, and path expurgation process are decided using the network layer protocol employed by the sender. Due to infrastructure-less support, ease of deployment, and technological interoperability, MANET finds its application in disaster recovery networks, emergency scenarios, commercial and residential applications, defense, etc. [1], [2].

MANET nodes face different challenges due to their resource-restricted access and utilization, including security and privacy issues due to the wireless communication medium. Wireless medium provides open access to other networks and users for interoperability and data sharing. The open-access nature of the medium is exposed to security risks where an intruder breaches the communication of the nodes [3]. Network dynamicity with time, node mobility,

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An Effective Salp Swarm Based MPPT for Photovoltaic Systems Under Dynamic and Partial Shading Conditions

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ABSTRACT This study proposes a duty cycle-based direct search method that capitalizes on a bioinspired optimization algorithm known as the salp swarm algorithm (SSA). The goal is to improve the tracking capability of the maximum power point (MPP) controller for optimum power extraction from a photovoltaic system under dynamic environmental conditions. The performance of the proposed SSA is tested under a transition between uniform irradiances and a transition between partial shading (PS) conditions with a focus on convergence speed, fast and accurate tracking, reduce high initial exploration oscillation, and low steady-state oscillation at MPP. Simulation results demonstrate the superiority of the proposed SSA algorithm in terms of tracking performance. The performance of the SSA method is better than the conventional (hill-climbing) and among other popular metaheuristic methods. Further validation of the SSA performance is conducted via experimental studies involving a DC-DC buck-boost converter driven by TMS320F28335 DSP on the Texas Instruments Experimenter Kit platform. Hardware results show that the proposed SSA method aligns with the simulation in terms of fast-tracking, convergence speed, and satisfactory accuracy under PS and dynamic conditions. The proposed SSA method tracks maximum power with high efficiency through its superficial structures and concepts, as well as its easy implementation. Moreover, the SSA maintains a steady-state oscillation at a minimum level to improve the overall energy yield. It thus compensates for the shortcomings of other existing methods.

INDEX TERMS MPPT, salp swarm optimization, partial shading, PV characteristic, MATLAB.

I. INTRODUCTION

Over the past decade, the increasing energy consumption and the inevitable reduction in fossil fuel resources (coal, oil, natural gas), as well as the rapid environmental deterioration resulting from global warming, have prompted global efforts to study renewable energy sources (RESs), such as wind, solar energy, hydropower, geothermal energy and biomass [1]. Overcoming these issues has become the focus of global market interest. Also, power generation from RESs saves billions of barrels of crude oil and reduces carbon dioxide (CO_2) emissions and greenhouse gases [2], [3].

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Firefly Algorithm-Based Photovoltaic Array Reconfiguration for Maximum Power Extraction during Mismatch Conditions

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Abstract: This studyaimed at improving the performance and efficiency of conventional static photovoltaic (PV) systems by introducing a metaheuristic algorithm-based approach that involves reconfiguring electrical wiring using switches under different shading profiles. Themetaheuristicalgorithmused wasthe firefly algorithm (FA), which controls the switching patterns under non-homogenous shading profiles and tracks the highest global peak of power produced by the numerous switching patterns. This study aimed to solve the current problems faced by static PV systems, such as unequal dispersion of shading affecting solar panels, multiple peaks, and hot spot phenomena, which can contribute to significant power loss and efficiency reduction. The experimental setup focusedon software development and the system or model developed in the MATLAB Simulink platform. Athorough and comprehensive analysis was done by comparing the proposed method's overall performance and power generation with thenovel static PVseries–parallel (SP) topology and totalcross-tied (TCT) scheme. The SP configuration is widely used in the PV industry. However, the TCT configuration has superior performance and energy yield generation compared to other static PV configurations, such as the bridge-linked (BL) and honey comb (HC) configurations. The results presented in this paper provide valuable information about the proposed method's features with regard toenhancing the overall performance and efficiency of PV arrays.

Keywords: photovoltaic cells; mismatch losses; partial shading; firefly; maximum power extraction

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1. Introduction

Solar energy is currently a demanding renewable power source forenergy supply. Solar energy hasan infinite supply, a simple installation process in remote areas [1], and is eco-friendly in nature. The solar module takes insolar energy or lightandgenerates electricity by absorbing the photon energy obtained from the sunlight and causing apotential difference, which allows the movement of electrons between the p–n junctions in the solar module. This process is called the photovoltaic effect. Therefore, the nonlinearity of the global maximum power peak (G_{MPP}) and solar photovoltaic (PV) performance depends on the surrounding factors, such as atmospheric temperature, solar irradiation, and partial shading conditions [2,3]. To represent the effect of irradiation, different levels of irradiation and theirrespective power curves areplotted in Figure 1. Due to varying levels of irradiation falling on PV modules, partial shading exists. This partial shading causes multiple peaks in power-voltage (P–V) curves and the presence of different current levels in the PV array.

2021 | OriginalPaper | Chapter

Converter/Inverter Topologies for Standalone and Grid-Connected PV Systems

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Abstract

Selection of a suitable power electronic converter to meet the desired outcome for any sort of application is a major step. In the case of solar photovoltaic (PV) systems, the right selection of a converter has a significant impact on its efficiency. Over the past few decades, scholars have carried out a great deal of analysis to satisfy load specifications. The electronic power converters produced vary from several milliwatts to megawatts of power depending on requirements. A thorough analysis of these topologies is addressed considering the essential role of converter topologies in standalone and grid-based solar systems in improving efficiency of output power. In this paper, the authors examined

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Literature

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Empowering smart grid: A comprehensive review of energy storage technology and application with renewable energy integration

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Highlights

- Review of energy storage type.
- Energy storage technology to support power grid operation.
- Energy storage services for renewable energy support.
- Energy storage framework for renewable energy integration.
- Challenges and future prospect of energy storage technology.

Abstract

The rapid growth in the usage and development of renewable energy sources in the present day electrical grid mandates the exploitation of energy storage technologies to eradicate the dissimilarities of intermittent power. The energy storage technologies provide support by stabilizing the power production and energy demand. This is achieved by storing excessive or unused energy and supplying to the grid or customers whenever it is required. Further, in future electric grid, energy storage systems can be treated as the main electricity sources. Researchers and industrial experts have worked on various energy storage technologies by integrating different renewable energy resources into energy storage systems. Due to the wide range of developments in energy storage technologies, in this article, authors have considered various types of energy storage technologies, namely battery, thermochemical, thermal, pumped energy storage, compressed air, hydrogen, chemical, magnetic energy storage, and a few others. These energy storage technologies were critically reviewed; categorized and comparative studies have been performed to understand each energy storage system's features, limitations, and advantages. Further, different energy storage system frameworks have been suggested based on its application. Therefore, this paper acts as a guide to the new researchers who work in energy storage technologies. The future scope suggests that researchers shall develop innovative energy storage systems to face challenges in power system networks, to maintain reliability and power quality, as well as to meet the energy demand.

Previous Next

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Development of Control Techniques Using Modified Fuzzy Based SAPF for Power Quality Enhancement

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ABSTRACT Low power distribution systems have severe power quality issues due to the non-linearity of several residential and industrial loads. The main power quality issue is the harmonics leading to the overheating of the transformers in the distribution systems. By employing passive filters, active filters, and custom power devices, the harmonics in the source current can be reduced. To overcome the drawbacks of conventional tuned filters and active power filters the modified shunt active power filter was introduced with the fuzzy logic controller. In this paper, an effective way of reducing the total harmonic distortion using three-phase three-wire shunt active filter is carried out and this has been investigated through three control methods namely synchronous reference frame theory, real and reactive power theory, and indirect reference current theory. The recognized control methods are implemented with the fuzzy controller to improve the performance of the induction motor drive. The hardware setup was implemented for the proposed fuzzy-based control technique to achieve better performance in terms of reduced total harmonic distortion and DC link voltage and improved speed performance of induction motor drive when compared to other control methods. Further power factor correction and better reactive power compensation are achieved by implementing hardware.

INDEX TERMS Power quality, SPAF, FUZZY controller, total harmonics distortion, DC link voltage, induction motor drives.

I. INTRODUCTION

The Active Power Filter (APF) is designed with voltage (or) current source inverters with a common DC link capacitor and coupled inductor. This can be inserted into the distribution line depending on the requirement either in series or shunt [1]–[2].

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The topology of the Shunt Active Power Filter (SAPF) is the same as the static compensator (STATCOM). The SAPF is used for compensating the reactive power, correcting the power factor, and regulating the voltage in the power transmission systems [3]. SAPF is connected to the line in shunt through the coupling inductor. SAPF compensating the load current harmonics by injecting the opposite compensating harmonic current that is equal in the magnitude of source current harmonics [4]. Similarly, the Series APF (SSPF) is

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A New Ken-Ken Puzzle Pattern Based Reconfiguration Technique for Maximum Power Extraction in Partial Shaded Solar PV Array

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The work of Hassan Haes Alhelou was supported in part by the Science Foundation Ireland (SFI) through the SFI Strategic Partnership Programme under Grant SFI/15/SPP/E3125, and in part by the University College Dublin (UCD) Energy Institute.

ABSTRACT Solar Photovoltaic array may often be subjected to partial shading, which may lead to uneven row current and creates local maximum power point on the power-voltage characteristics. One of the effective approaches to dilute the concentration of partial shading is the array reconfiguration technique. This study proposes a ken-ken puzzle-based reconfiguration technique for 4×4 total-cross-tied configuration to rearrange the position of modules within the array and to improve the maximum power under partial shading conditions. Further, the performance of the ken-ken puzzle arrangement is compared with the total-cross-tied configuration and existing reconfiguration techniques namely odd-even, Latin Square, and Sudoku reported in the literature. The performance of all these configurations is evaluated in terms of fill factor, mismatch loss, power loss, execution ratio, and performance enhancement ratio. The proposed ken-ken puzzle-based reconfiguration technique mitigates the occurrence of local maximum power point and eliminates the need for a complex algorithm to track the global maximum power point. The simulation result shows that the KK puzzle-based reconfiguration technique has obtained an improved PE of 10.85 % compared to TCT configuration, followed by LS, Sudoku, and OE. Also, the experimental result shows the effectiveness of the ken-ken in diluting the effects of partial shading when the rows of the photovoltaic array are shaded. The ken-ken puzzle-based reconfiguration technique reduces the complexity, maintenance and increases reliability, scalability of the PV array.

INDEX TERMS Shade dispersion, ken-ken puzzle pattern, global maximum power point, local maximum power point, and performance enhancement ratio.

I. INTRODUCTION

The partial shading can occur in a photovoltaic (PV) module due to shading of nearby buildings, clouds, dust, and dirt, etc. The shaded modules consume power from the non-shaded modules and dissipate energy in the form of heat. Therefore, the bypass diodes are connected across the modules [1]–[3]. However, this introduces local maximum power point (LMPP) in power-voltage (P-V) characteristics, which misleads the maximum power point tracking

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A TCT-SC Hybridized Voltage Equalizer for Partial Shading Mitigation in PV Arrays

Publisher: IEEE

Priya Ranjan Satpathy ; Thanikanti Sudhakar Babu ; Ali Housein Mahmoud ; … **All Authors**

Abstract: In this paper, a novel voltage equalization technique based on the hybridization of total cross-tied configuration and switching capacitor concept for enhancing the power... **View more**

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Abstract:

In this paper, a novel voltage equalization technique based on the hybridization of total cross-tied configuration and switching capacitor concept for enhancing the power generation of PV arrays during partial shading is proposed. The technique uses the charge balancing concept to maintain the voltage ratio between the total cross-tied array modules and ensures higher power output and convex power curves during partial shading. The validation of the proposed system is carried out in the MATLAB environment for three different size PV arrays under partial shading and compared with the conventional and three reconfiguration techniques in terms of power generation, losses, and conversion efficiency. Also, the insertion losses encountered by the proposed system are derived mathematically. The study concludes that the proposed system tends to generate higher power than any other techniques during shading with conversion efficiency of more than 97%.

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RESEARCH ARTICLE

Estimating the optimal parameters of solid oxide fuel cell-based circuit using parasitism-predation algorithm

Dalia Yousri, Ahmed Fathy, Thanikanti Sudhakar Babu, Mohamed R. Berber

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Dalia Yousri and Ahmed Fathy contributed equally to this work.

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Summary

The process of constructing a reliable mathematical model of solid oxide fuel cell (SOFC) is a challenge due to its complex nature. This paper proposes a new methodology incorporated a recent meta-heuristic algorithm named parasitism-predation algorithm (PPA) to estimate the optimal parameters of SOFC equivalent circuit. Two experiments are conducted in this work; the first one comprises four measured datasets for a commercial enhanced cylindrical SOFC manufactured by Siemen Energy. While the second series consists of five measured datasets for a theoretical $5(KW)$ dynamic SOFC stack with 96 connected cells. The collected datasets are measured at different operating conditions. An excessive comparative study is presented with other optimizers of comprehensive learning particle swarm optimization (CLPSO), improved PSO with difference mean with perturbation (DMP_PSO), heterogeneous CLPSO (HCLPSO), locally informed PSO (LIPS), modified CSO with tri-competitive mechanism (MCSO), opposition-based learning competitive PSO (OBLCPSO), ranking-based biased learning swarm optimizer (RBLSO), competitive swarm optimizer (CSO), hybrid Jaya with DE (JayaDE), and social learning PSO (SLPSO). Furthermore, statistical analyses of the ranking tests, multiple sign tests, Friedman tests, and ANOVA are performed. The obtained results confirmed the proposed PPA's competence in constructing a reliable model of SOFC as it

Performance Evaluation of Modified SEPIC converter for Renewable Applications

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Abstract: In most of the power electronics applications, DC to DC converts have their importance in providing better regulated output for renewable application. The converters like boost and classical SEPIC converters provide limited voltage gain. The new DC to DC converter is Modified SEPIC converter and is designed and developed in MATLAB/SIMULINK to have better regulated voltage and their performance was estimated in terms of output voltage, output current, gain and efficiency.

Keywords: **Converter, Modified SEPIC converter, Efficiency, Gain etc.**

1. INTRODUCTION

We know that the non-renewable energy resources are the new trend in generating electricity. Out of these, solar energy is the most popular and efficient method of electricity generation. For this, special devices called solar cells are installed. The semiconductor material emits electrons when light energy is incident on a solar panel. However, this method has its own disadvantages. Sunlight is Earth's primary source of energy. Solar PV is a semiconductor device which converts sunlight directly into electricity. The electricity generated by a PV module is of the DC (direct current) type. The amount of electricity produced by a PV module is proportional to its size; the larger the module, the more electricity it produces and the higher the cost of electricity. To overcome this problem, power converters which steps up the input electrical energy to the desired level are developed. To step up the energy generated from a PV module, we generally use a DC to DC converter like Boost, Buck-Boost, SEPIC converter and Modified SEPIC converter [1,2].

But Classical converters (Boost and Buck-Boost) gives limited voltage gain of about G=5 with duty ratio of 0.8 and normally can operate with an adequate static and dynamic performance. SEPIC converter also generates limited gain same as boost converter, also has high input ripple current. To overcome these drawbacks, some modifications have been done to the SEPIC converter. Modified SEPIC converter has less passive components, high static gain, high efficiency, low input ripple current, soft switching and good dynamic response. Modified SEPIC converter has two topologies: Without Coupling and With Coupling [3,4].

This paper aims to build a converter which steps up the energy generated by a low power DC source. The main objective is to build modified SEPIC converter to improve the converter static gain, enable soft switching, and obtain better efficiency. The analysis was carried out in MATLAB/SIMULINK environment.

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ORIGINAL CONTRIBUTION

Investigation of Partial Discharge Due to Particle Movement in Power Transformer Using Computational Fluid Dynamics and Monte Carlo Technique

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

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Abstract The paper deals with the movement of metallic particle contaminants in transformer oil and partial discharges due to its presence inside the power transformer. Transformer oil has several particle contaminations, which float and travel along with oil in the gap between transformer discs and inner pressboard cylinder. Activity of partial discharge (PD) is analyzed using Monte Carlo technique and Computational Fluid Dynamics. Probability of PD is calculated using Monte Carlo simulation, and particle movement is traced using Computational Fluid Dynamics. Using the above methods, point of contact between particle and transformer disc under different conditions is determined. Electric stress on the particle due to disc voltage is calculated theoretically. In the present simulation, impact of field multiplication factor is considered for initiation of PD. From the results, it is observed that particle movement and partial discharge are influenced by field multiplication factor, oil velocity, type of material and starting point of the particle.

Keywords Computational fluid dynamics · Partial discharges · Particle tracking · Power transformer

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Introduction

Power transformers are used in power sector to step-up and step-down voltages as per the requirement. These transformers are used to operate at very high voltages. Insulation system of transformer consists of paper insulation and transformer oil. There are regions of high electric stress in the high voltage (HV) side of the transformer. If the stress exceeds the threshold level, Partial Discharge (PD) is initiated. PD is one of the reasons for power transformer failures. Levels of stress are different at various points in transformer. If it is not controlled, then the partial discharge (PD) value may become higher than the permitted magnitude. PD may be initiated in transformer due to voids, gas bubble, presence of conducting particles, etc. The present analysis is limited to PD due to presence of metallic particles in the liquid insulation of transformer. Metallic particles in the oil may present in the transformer due to manufacturing process or due to wear and tear operation of transformer. These particles may lead to the PD activity during the service of the power transformer.

Monte Carlo technique is used to analyze the random behavior of particle in different applications. A research work shows [1] that the trajectory of different particles in SF6 / N2 mixture in a Gas Insulated Sub-station is determined using Monte Carlo technique. Random movement of the particle near the HV winding is simulated using Monte Carlo technique [2]. Probability of particle striking the winding is calculated for different velocities of the particle. It is concluded that the probability increases with the increase in velocity. Computational Fluid Dynamics (CFD) is used as a proficient platform for simulation and analysis of different systems, which involve fluid flow. Fluid flow analysis of transformer [3] is performed by constructing a network model of complex power transformer, and the oil

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An Utilization Of Robot For Irrigation Using Artifical Intellegnece

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Abstract
Irrigation systems are just as ancient as human beings, because farming is a civilized civilization's main profession. It is an insurmountable challenge to irrigate big planting regions. Various irrigation planning systems, particularly are mostly focused on soil, vegetation and predictive maintenance, were already established to solve this challenge. Irrigation planning covers whether irrigation is necessary as well as how much water is to be used. Resulting from environmental circumstances, fluid should be supplied to plants. Each plant also starts to improve varying quantities of water. We thus have developed a robot dubbed the watering robot for the plant. This robot monitors agricultural or planting soil relative humidity When the quantity of groundwater is less about 30%, it signifies that the surface is drying, then liquid quickly passes and the ocean levels climb to 100%. This work proposes artificial smart controllers for efficient irrigation programming and provides an Automated Quantum Computing Watering System that can independently water regions utilizing measurements. Within the method suggested, the farmers utilizing Artificial Intelligence need to get the updated information inside this domain of irrigate from the producer who really is present on a separate site than just the farmer. The mechanism drains the rain energy as well. Certain methods reduce the overuse of water, insecticides, preserve the agricultural production, and also assist to use personnel efficiently, increase production and enhance durability.
Keywords: *Irrigation System, Plant Watering Robot, Artificial Intelligence.*

1. Introduction

85 percent of the world largest water availability are used by farming, however because of urban sprawl and a growing need for sustenance the above proportion will continued dominating methane emissions. Because of the very low available water reserves and even the availability of teachers we have improved our equipment and developed many various methods of water usage in agriculture. In order to optimise wheat output and efficiency of freshwater consumption in relation to weed management regarding the soil assessment, water pump planning has been repeatedly proved to be effective. The assessment of plant evaporative cooling is an innovative measure to assess irrigation requirements (ET). ET affects meteorological parameters such as direct sunlight, warmth, moisture, wind direction, soil composition, management components, soil qualities, pests, and antibiotic resistance. ET is impacted by wind velocity, wind velocity as well as crop variables. [1].

An surge has occurred over the years in computational methods notably in heath, meteorological, nuclear technology, robotics, agriculture, etc.[5]. More over half of the people worldwide is interested in farming. AI for farming, economic marketing efforts, wind patterns and time of the release is implemented in the field of farmland. Farmers benefit from AI and increase yield in comparison to conventional agricultural methods.[2]. In

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An Internet of Things For Prevention Of Security Attack On Cloud Medical Data Using Artifical Intelligence

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Abstract

The Internet of Things (IoT) and artificial intelligence (AI) applications have been developed in the field of information and innovation in modern times. Since smart devices largely contain detectors, handsets have become a basic requirement in day-to-day living and wireless communication. These involves cloud technology that makes Internet of Things data computation on requested possible. The sensors connected to the external surroundings are able to detect data sources to which they are attached and preserve that information in the cloud. The cloud offers the insights and safety of perceived medical information as a great health system. In order to improve health, security and care for thousands of humans, the Internet of Things is increasingly playing an ever vital role. Rather than travelling to the clinic to get aid, individuals may check their health metrics virtually, constantly and in real time and then be analysed and transferred to their medical data centres, such as private cloud. This paper developed an automated and secured hospital environment design that utilizes the IoT and AI, data safety, confidentiality, effectiveness and system security.

Keywords: *Internet of Things(IoT), Artificial Intelligence(AI), Healthcare, information security, Cloud Security,*

1. Introduction

The Internet of Things is a notion that reflects a linked group of people, everywhere, every service, every network. The IoT is a major movement towards new technology that may effect on the whole spectrum of businesses and may be considered to be the connectivity of unique smart things and gadgets with extensive profits inside today's internet architecture. The sophisticated connection of these equipment, software and databases, which goes further than the mechanical situations, often includes [3]. The adoption of automation is therefore plausible in

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Enhancement of Power Quality in a Wind Energy system by using STATCOM

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Abstract **- In recent years, wind energy has become one of the most important and promising sources of renewable energy, which demands additional transmission capacity and better means of maintaining system reliability. To have sustainable growth and social progress, it is necessary to meet the energy need by utilizing the renewable energy resources like wind. The need to integrate the renewable energy like wind energy into power system is to make it possible to the minimize the environmental impacts. Wind energy conversion systems are the fastest growing renewable source of electrical energy having tremendous us environmental, social, and economic benefits. In this paper, there will be the analysis of factors which are responsible for the Power Quality problems in the wind energy conversion system and implementation of proper control scheme for Power Quality in improvement in the wind energy conversion system connected to the grid. In the proposed scheme, Static Compensator (STATCOM) is connected at a point of common coupling with a Battery Energy Storage System (BESS) to mitigate the power quality issues. A STATCOM provides Reactive Power support to wind generator and load. The battery energy storage system is used as an energy storage element for the pure of voltage regulation. The battery storage provides a rapid response for either charging or discharging the battery thus it acts as a constant voltage source in the power system. The battery storage is effective when wind speed output fluctuations are high particularly at speed just below the normal operating speed. The control scheme approach is based on injecting the currents into the grid using Bang-Bang controlle. The proposed control scheme for the grid connected wind energy generation system for power quality improvement is simulated using MATLAB/SIMULINK.**

Keywords **– Power Quality, Wind energy system, Battery Energy Storage System, STATCOM**

I. INTRODUCTION

To have sustainable growth and social progress, it is necessary to meet the energy need by utilizing the renewable energy resources like wind, biomass, hydro, co-generation, etc [1]. In sustainable energy system, energy conservation and the use of renewable source are the key paradigm. The need to integrate the renewable energy like wind energy into power system is to make it possible to minimize the environmental impact on conventional plant. The integration of wind energy into existing power system presents a technical challenge and that requires consideration of voltage regulation, stability, power quality problems. The power quality is an essential customer-focused measure and is greatly affected by the operation of a distribution and transmission network. The issue of power quality is of great importance to the wind turbine. In the fixed-speed wind turbine operation, all the fluctuation in the wind speed is transmitted as fluctuations in the mechanical torque, electrical power on the grid and leads to large voltage fluctuations. During the normal operation, wind turbine produces a continuous variable output power. These power variations are mainly caused by the effect of turbulence, wind shear, and tower-shadow and of control system in the power system.

Thus, the network needs to manage for such fluctuations. The power quality issues [2] can be viewed with respect to the wind generation, transmission, and distribution network, such as voltage sag, swells, flickers, harmonics etc. However, the wind generator introduces disturbances into the distribution network. One of the simple methods of running a wind generating system is to use the induction generator connected directly to the grid system. The induction generator has inherent advantages of cost effectiveness and robustness. However, induction generators require reactive power for magnetization. When the generated active power of an induction generator is varied due to wind, absorbed reactive power and terminal voltage of an induction generator can be significantly affected [3]. A proper control scheme in wind energy generation system is required under normal operating condition to allow the proper control over the active power production. In the event of increasing grid disturbance, a battery energy storage system for wind energy generating system is generally required to compensate the fluctuation generated by wind turbine. A VSC based control technology has been proposed for improving the power quality which can technically manages the power level associates with the commercial wind turbines[4]-[6]. The proposed VSC control scheme for grid connected wind energy generation for power quality improvement has following objectives.

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Design and Implementation of Solar Based Dc Grid using Arduino Uno

M Thirupathaiah

Abstract: ***Renewable Energy Sources (RES) such as Solar Photovoltaic (PV) became more popular over the last decade due to increasing environmental awareness and tax exemption policies on the solar PV systems. Integration of solar PV using various smart load management techniques will boost the efficiency of the overall system by reducing the massive cost of electricity bills. There is a need to find efficient and expert ways to enjoy these RES exclusively. Besides providing the connection between different loads, this system has the ability to collect information and execute control commands for the households by providing continuous observations and information about both load and supply profile, convincing the end user to take preventive measures by switching the auxiliary load to save power. This paper presents implementation of a low cost Solar based DC grid using Arduino. In the proposed system, the node which acts as a microcontroller reads the power consumption by the loads in each unit through current sensor. When the excess amount of power is consumed at particular unit, the controller makes the relay cut off the supply to the loads, which will be continuously displayed through LCD. This DC based power system helps to eliminate the requirement of converters systems, reducing converter cost, power system complexity, improve efficiency and reliability.***

Keywords: Renewable Energy Sources (RES), Solar Panel, Current sensor, Arduino Uno, Relay, LCD Module

I. INTRODUCTION

Solar energy is a clean and renewable power resource and is on its way to high level penetration in the world electricity energy basket. [1] However, there are several challenges associated with solar energy, like intermittency, limited dispatch ability and non-storability. Non-storability in a standalone PV system can be mitigated by incorporating energy storage devices like battery to store the electrical energy produced by solar panel when the sun is shining and to supply power when the sun is not shining. Batteries are, therefore, one of the critical components in the standalone PV system. And often the weakest link in PV systems as it influences the maintenance cost and reliability of the system.[2] The major components in standalone solar PV system are Solar PV panels, batteries and power conditioning devices. The solar PV panels produce DC power which was later on converted to AC using converter devices. Nowadays, increasing number of devices which use DC, such as laptops, mobile phones and other power electronic devices used in our daily life are being incorporated. Such applications need to convert AC back to DC [3]. This conversion increases the losses and complexity of the power system. This concept is particularly useful for rural and sparsely populated areas where in low voltage DC network can supply electricity generated by solar PV to cater to the load constituting of LED lamps, DC fan, TV and mobile charging stations.

The objective of the proposed work is

- To generate power through an array of solar panels connected each to an individual location and charge the battery through a charging circuit by using the generated power.
- To supply the generated power to the DC loads through the microcontroller that reads the power consumption through the current sensor and displaying it using LCD.
- To differentiate the power consumption between two homes where one home is provided with back up and other without backup through the LCD.

The developed solar based DC grid system for DC loads has been designed for use in Solar Home Systems (SHS) [4]. The individual SHS can be connected to form a low voltage DC micro grid for the remotely located rural population for sustainable provision of electric energy services. Two homes are shown where in the one with backup battery has uninterrupted power supply to the DC loads and the other home without backup battery cuts off the supply to the loads depending on the set units consumption limit in the microcontroller code.

II. BLOCK DIAGRAM

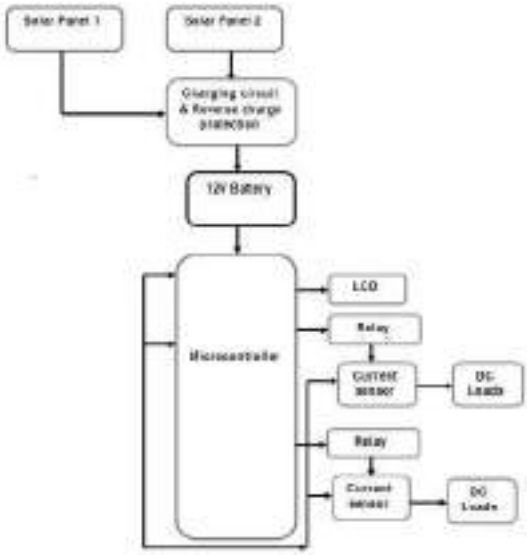

Fig. 1. Block Diagram

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Control of Standalone Wind energy conversion system using Pitch control Technique

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Abstract

Present energy need heavily relies on the conventional sources. But the limited availability and steady increase in the price of conventional sources has shifted the focus toward renewable sources of energy. Of the available alternative sources of energy, wind energy is considered to be one of the proven technologies. With a competitive cost for electricity generation, wind energy conversion system (WECS) is nowadays deployed for meeting both grid-connected and stand-alone load demands. However, wind flow by nature is intermittent. In order to ensure continuous supply of power suitable storage technology is used as backup. In this paper, the sustainability of a 4-kW hybrid of wind and battery system is investigated for meeting the requirements of a 3-kW stand-alone dc load representing a base telecom station. A charge controller for battery bank based on turbine maximum power point tracking and battery state of charge is developed to ensure controlled charging and discharging of battery. The mechanical safety of the WECS is assured by means of pitch control technique. Both the control schemes are integrated, and the efficacy is validated by testing it with various load and wind profiles in MATLAB/SIMULNIK.

Keywords: *Wind energy, Maximum power point tracking, Wind turbine, Pitch control technique.*

1. Introduction

Energy is the considered to be the pivotal input for development. At present owing to the depletion of available conventional resources and concern regarding environmental degradation, the renewable sources are being utilized to meet the ever-increasing energy demand. Due to a relatively low cost of electricity production wind energy is considered to be one of the potential sources of clean energy for the future. But the nature of wind flow is stochastic [1]. So rigorous testing is to be carried out in laboratory to develop efficient control strategy for wind energy conversion system (WECS). Nowadays, many stand-alone loads are powered by renewable source of energy. With this renewed interest in wind technology for stand-alone applications, a great deal of research is being carried out for choosing a suitable generator for stand-alone WECS. The major advantage of asynchronous machine is that the variable speed operation allows extracting maximum power from WECS and reducing the torque fluctuations. Induction generator with a lower unit cost, inherent robustness, and operational simplicity is considered as the most viable option as wind turbine generator (WTG) for off grid applications. However, the induction generator requires capacitor banks for excitation at isolated locations.

The excitation phenomenon of self-excited induction generator (SEIG) is explained in [2]. The power output of the SEIG depends on the wind flow which by nature is erratic. Both amplitude and frequency of the SEIG voltage vary with wind speed. Such arbitrarily varying voltage when interfaced directly with the load can give rise to flicker and instability at the load end. So, the WECS are integrated with the load by power electronic converters in order to ensure a regulated load voltage. Again, due to the intermittent characteristics of the wind power, a WECS needs to have energy storage system. An analysis of the available storage technologies for wind power application is made in and. The advantage of battery energy storage for an isolated WECS is discussed in. With battery energy storage it is possible to capture maximum power from the available wind. A comparison of several maximum power point tracking (MPPT) algorithms [3] for small wind turbine (WT) is carried out in and. In order to extract maximum power form WECS the turbine needs to be operated at optimal angular speed.

However, do not take into account the limit on maximum allowable battery charging current nor do they protect against battery overcharging. In order to observe the charging limitation of a battery a charge controller is required. Such a charge control scheme for battery charging for a stand-alone WECS using MPPT is explained in. However, in this paper also the maximum battery charging current is not limited. The discontinuous battery charging current causes harmonic heating of the battery. Also, the MPPT implementation is highly parameter dependent and will be affected by variation of these parameters with operating conditions [4].

MACHINE LEARNING BASED ADAPTIVE PROTECTION OF MICROGRID FOR OPTIMISED POWER SYSTEM MANAGEMENT

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ABSTRACT

This paper presents a rule-based adaptive protection scheme using machine learning methodology for microgrids in extensive distribution automation. The uncertain elements in a microgrid are first analyzed quantitatively by Pearson correlation coefficients from data mining. Then a so-called hybrid artificial neural network and support vector machine (ANN-SVM) model is proposed for state recognition in microgrids, which utilizes the growing massive data streams in smart grids. Based on the state recognition in the algorithm, adaptive reconfigurations can be implemented with enhanced decision making to modify the protective settings and the network topology to ensure the reliability of the intelligent operation. The microgrid concept is a promising approach for injecting clean, renewable, and reliable electricity into power systems. It can operate in both the grid-connected and the islanding mode. This paper addresses the two main challenges associated with the operation of a microgrid i.e. control and protection. A control strategy for inverter based distributed generation (DG) and an energy storage system (ESS) are proposed to control both the voltage and frequency during islanding operation. The protection scheme is proposed to protect the lines, DG and ESS. Further, the control scheme and the protection scheme are coordinated to avoid nuisance tripping of the DG, ESS and loads. The feasibility of the proposed method is verified by simulation and experimental results.

Keywords: Microgrid, microgrid protection, distributed generation, energy storage system (ESS), artificial neural network, Machine Learning

1. INTRODUCTION

Microgrid, which is one of the main foundations of the future grid, inherits many properties of the smart grid such as, self-healing capability, real-time monitoring, advanced two-way communication systems, low voltage ride through capability of Distribution Generation (DG) units, and high penetration of DGs. These substantial changes in properties and capabilities of the future grid result in significant protection challenges such as bidirectional fault current, various levels of fault current under different operating conditions, necessity of standards for automation system, cyber-security issues, as well as, designing an appropriate grounding system, fast fault detection/location method, the need for an efficient circuit breakers for DC

Microgrid Control Schemes And Current Trends For Sustainable Energy

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Abstract

A microgrid is one of the improving concepts and creates the power grid works as smarter. Control technique in Microgrid working and operation is a key element for application and research. A microgrid is an aggregation of multiple distributed generators (DGs), energy storage systems, and loads. A microgrid can be operated in both islanding mode and grid-connected mode. Micro grid's control is necessary to provide power quality, system stability, and also reliability. Most DG technologies, which can be installed in the microgrid, are not suitable to direct connection to the grid because of their power generation characteristics. Therefore, for the installation of these units in the microgrid, we need the power electronic converters. Hence, the main concern in the operation of the microgrid is to control the power electronics units. Microgrid's control methods are different with respect to its structure that is mean that what type of microgrid exists for study, DC or AC microgrid or consolidation of them that is called hybrid microgrid. It is noticeable that control methods in the microgrid are also different from the point of view of control functions. For example, output power control of DGs, islanding detection, synchronization with the upstream grid, power quality, participation in the energy market and etc. Moreover, control methods of microgrid can be divided into two general categories such as control methods based on communication infrastructure and without communication link.

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SIMULATION OF IGBT BASED SOLID STATE FAULT CURRENT LIMITER USING MATLAB/SIMULINK

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ABSTRACT

Owing to the surge in demand for electrical energy and increase in penetration of Diesel Generators, an increase in the fault level of the power system is being observed. The employment of the FCL (Fault current limiter) has been one of the most efficient techniques for the control of fault current in recent times. This paper introduces and describes a solid-state fault current limiter which is controlled by an Insulated Gate Bipolar Transistor (IGBT). The complete design and analysis have been discussed. The simulation is done with MATLAB/Simulink software.

Key words: Fault Current Limiter (FCL), Superconducting Fault Current Limiter (SFCL), Solid state Fault Current Limiter (SSFCL), varistor, IGBT

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DESIGN OF SMART PURCHASE CART FOR COMMERCIAL APPLICATION USING RASPBERRY PI AND RFID

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ABSTRACT

Shopping in a big crowd is a challenge to find item required and also to finish it intime. Unlike earlier, shopping in modern days enabled the costumer to pick the item by self and to bring it to billing. This reduced the waiting time of the costumer to get the item. But the less or more the crowd, waiting time for the billing process grows with the number of items of the purchase. The development of smart purchase cart which is a system which allows faster checkout during retail shopping experience. The Smart Purchase cart inevitably will require very good and flexible design that will attract the client to use the product. The concept of purchase cart is a smaller form of the automated self-checkout system on a shopping purchase cart which consists of IR Obstacle sensors, Barcode Scanner, RFID reader module, Raspberry Pi 3 Model B and tags. Purchase cart is expected to allow customers to scan their products themselves, make payment for items scanned and placed in the purchase cart before leaving the store. The Smart Purchase cart comes with all the traditional services including scanning an item to check for price and details. The mode of payment is cashless which is very effective now-a-days. In the coming days, this smart shopping purchase cart will be a more reliable form of check out process. This paper deals with the design of faster smart purchase cart using Raspberry Pi.

Key words: Raspberry Pi 3, IR obstacle sensors, RFID tag, barcode sensors

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1. INTRODUCTION

A purchase cart, with the ability to bill by itself is the solution to overcome billing time issue. Control circuit which are instigated on microcontrollers which contain external memory chips with various peripheral devices and this becomes more difficult in order to implement a big

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Research Article

A Fuzzy Based Grid Maintenances and Load Balancing Technique for Feature Applications

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ABSTRACT: In a Mobile Ad Hoc Network, this article suggests a Fuzzy dependent power scheduling and load balancing strategy for ZRP (MANET). The duty-cycles of border nodes are adaptively modified using this method, which takes into account the queue condition, expected residual capacity, and distance to border nodes. The nodes are active throughout each round and then go into sleep mode depending on the calculated duty-cycle time. When the load reaches a certain threshold, the zone leaders (ZL) are updated adaptively.

Keywords: border node, duty cycle, fuzzy, load balancing, power schedule, queue state, Residual energy

Abbreviations: MANET, mobile adhoc network; ZRP, zone routing protocol; ZL, zone leader.

I. INTRODUCTION

MANET is a group of active, automated and radio fortified nodes deprived of any substructure. MANET need every single intermediary node to perform as forwarders, getting and advancing data to every another node. This sort of network is commonly positioned in numerous situations in which immediate connectivity turns out to be the on-going need, either in alternative circumstances such as a calamitous emptying condition or in an unplanned gathering for performances [1]. Due to frequent node mobility, network disconnections and link failures are common in this network [2]. Hence, routing becomes a critical job in MANET [3].

ZRP [14] combines the best features of constructive and reactive routing protocols to solve problems [4].But still, many issues exist in ZRP which are to be solved. Data forwarding is performed by each node with maximum power thus ignoring its position in the zone. If the difference between the source and destination is a significant factor node is minimum, it leads to power wastage. On the other hand, if the distance is high, the destination may lie outside the zone radius. While increasing its broadcast attempts to determine the border node, the bandwidth consumption of source node will increase [5].

Location Based Topology Control approach was proposed by Niranjan Kumar Ray et al [6]. It combines topology control and power management techniques to reduce the transmission power of each node. Nodes are put into sleep mode based on the traffic load such that the network is not disconnected.

Zone based Collision Guided (ZCG) protocol has been developed by Shadi S. Basurra et al [7]. ZCG uses parallel and broadcasting techniques for route determination. The determined routes have high connectivity and lesser energy consumption. It separates the network into areas where trustworthy representatives are chosen.
A new routing algorithm was proposed by Indrajit Bhattacharya et al [8], which uses ZRP and Minimum Estimated Expected Delay (MEED) protocols. In this algorithm, the data is transmitted to the destination, within a specific deadline
The routing protocol proposed by Bency Wilson et al [9], combines both proactive and reactive routing methods. Like ZRP, it applies proactive routing inside the zones and reactive routing outside the zones. The speed and locations of each node are monitored continuously. This approach results in increased bandwidth utilization, reduced power consumption and less routing overhead.

Nassir Harrag et al [10] have proposed an algorithm Particle swarm optimization (PSO)and ZRP, to adaptively adjust the zone radius of each node. It enhances the performance of ZRP by reducing the delay, increasing the delivery ratio and reducing the control overhead.

A Genetic Zone Routing Protocol (GZRP) was proposed by Sateesh Kumar et al [11]. It applies Genetic algorithm for IERP and BRP components of ZRP. It determines multiple paths to the destination to perform load balancing. GZRP outperforms the existing ZRP to provide scalability and robustness.

SOLAR ENERGY TRACKING AND MONITORING SYSTEM OVER IOT

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Abstract— Solar is a non conventional source of energy, considering this we have developed solar panels so that we can fulfil our electricity need. But due to revolution of the earth, solar source i.e., sun does not face the panel continuously hence less electricity is produced. The energy panel should face the SUN till it is present in a day.

The problem above can be solved by our system by tracking the solar energy. The main goal of this project is to design a very precise solar tracker and share the information through IoT. The block diagram below shows system architecture it consist of a LDR sensor senses max solar power which is being given to the Microcontroller which digitizes the LDR output. Controller then takes the decision according to then algorithm and tilts the panel towards the direction of the max energy given by LDR with the help of DC Motor. The Motor is used to rotate the LDR to sense the max solar power. The solar Panel is placed on the arrangement made on the shaft of the DC motor and is controlled using microcontroller. The microcontroller here we are using is Arduino UNO. The motor is driven by a motor driver. Current and voltage values monitoring and displayed on LCD correspondingly its operation. With stored energy we can control loads and share this current and voltage values over IoT.

Keywords: Artificial intelligence markup language, Python, TensorFlow, Flask, Natural language processing.

I. INTRODUCTION

Solar Panels are a form of active solar power, a term that describes how solar panels make use of the sun's energy; solar panels harvest sunlight and actively convert it to electricity. Solar Cells, or photovoltaic cells, are arranged in a grid-like pattern on the surface of the solar panel. Solar panels are typically constructed with crystalline silicon, which is used in other industries (such as the microprocessor industry), and the more expensive gallium arsenide, which is produced exclusively for use in photovoltaic (solar) cells. Solar panels collect solar radiation from the sun and actively convert that energy to electricity. Solar panels are comprised of several individual solar cells. These solar cells function similarly to large semi-conductors and utilize a large area p-n junction diode. When the solar cells are exposed to sunlight, the p-n junction diodes convert the energy from sunlight into usable electrical energy. The energy generated from photons striking the surface of the solar panel allows electrons to be knocked out of their orbits and released, and electric fields in the solar cells pull these free electrons in a directional current, from which metal contacts in the solar cell can generate electricity.

The more solar cells in a solar panel and the higher the quality of the solar cells, the more total electrical output the solar panel can produce. The conversion of sunlight to usable electrical energy has been dubbed the Photovoltaic Effect. A solar tracker is a device that orients a payload toward the sun. The use of

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A Real Time and Development Integration of Renewable Sources of Energy into Power Grid Application

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***Abstract*—**The huge, ever growing demand for electrical energy has hitherto been primarily met through the combustion of fossil fuels, and conversion of heat liberated therefrom. The relentless exploitation of these resources has raised questions regarding emission of greenhouse gases, particulate pollution, and their harmful effects on environment. It also brings into focus the sustainability of generation to satisfy the demand for energy in the coming decades, from fuels which are not inexhaustible. Renewable sources of power such as the sun, the wind and the tides offer solutions to these issues. The continuously falling cost of Solar and Wind generation technology has also made this option economically viable. They are rendered even more attractive by governments in many countries, which are keen to promote green and clean energy, by adoption of favorable policies. But the large-scale use of renewable sources of energy give rise to many technical challenges for the power system engineers. It is necessary to overcome them before the renewable sources come into wide use in conjunction with conventional generation based on fossil fuels. An attempt is made in this paper to identify the issues which arise as a consequence of integration of the renewable sources with the existing power grids, and look for solutions to some of them, particularly the stability of voltage, through the control of reactive power and active power.

Keywords*—RES, SPV, WTG, energy storage, DCI, POI, voltage ride through, reactive power control, voltage stability*

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COOPERATIVE OPTIMAL CONTROL STRATEGY FOR MICROGRID UNDER GRID-CONNECTED MODE

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Abstract: ***This paper investigates the control performance of a physical configuration of a microgrid (MG), integrated with photovoltaic (PV) arrays, battery energy storage systems (BESSs), and variable loads. The main purpose is to achieve cooperative optimal control under both grid-connected and islanded modes for the MG. For the grid-connected mode, a voltage source inverter (VSI) based on swoop control is used to control the MG connection to the grid even if PV arrays are under partially shading conditions (PSC). Then, for the islanded mode, the paper analyzes the model of the PV unit and BESS unit detailed from the small signal point of view and designs the suitable control strategy for them. Finally, the whole MG system combines the droop control and the main/slave control to stabilize the DC bus line voltage and frequency. Both simulation and experimental results confirm that the proposed method can achieve cooperative control of the MG system in both grid-connected and islanded mode.***

Keywords: *Grid-Connected Mode Mode, Microgrid Control, Distributed Generation, Energy Management, , Energy Storage, Frequency Control, Microgrid, Power System, Voltage Control.*

I INTRODUCTION

Microgrid is an important and necessary part of the development of smart grid. The microgrid is characterized as the "building block of smart grid" . It comprises low voltage (LV) system with distributed energy resources (DERs) together with storage devices and flexible loads. The DERs such as micro-turbines such as, fuel cells, wind generator, photovoltaic (PV) and storage devices such as flywheels, energy capacitor and batteries are used in a microgrid. The microgrid can benefit both the grid and the customer. From the customer's view: microgrids answer to both thermal and electricity needs and enhance local reliability, reduce emission, improve power quality by supporting the voltage and frequency and potentially lower costs of energy supply. From the utility's view: a microgrid can be seen as a controlled entity within the power system as a single dispatch able unit (load or generator) or ancillary services provider. Normally, a microgrid has two modes of operation: the island mode and the grid connected mode. In the island mode, the production is required to meet the loads demand. On the other hand, when the microgrid is connected to grid, it can either receive or inject power into the main grid. Furthermore, the gird connected microgrid can provide power supporting to its local loads demand. When a disturbance occurs, the microgrid is disconnected from the distribution network as soon as possible in order to avoid any further damage. In that case, the microgrid will operate in an island mode. Furthermore, the operation mode is related to the elasticity supply, local loads demand and the electricity market. Thus, the objectives of the optimal operation scheduling in microgrids concern with the economical, technical and the environmental aspects. A microgrid can provide a large variety of economic, technical, environmental, and social benefits to both internal and external stake-holders depending on its operation strategy. Microgrid control can be divided into the coordinated control (supervisory control or energy management) and local control. First, the coordinated control optimizes to allocate the power output among DER, the cost of energy production and emission. The forecast values of

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Research Article

Household Load forecasting using Deep Learning neural networks

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Abstract: Advancements in different types of electrical meters and computing technologies aiding the data collection and sensing of various parameters of the electrical power system has been made possible with the availability of vast amount of electrical data. With the help of such technology and data, statistical prediction of load can be made smarter and more accurate. This can help stop excessive electricity production. With the help of deep learning techniques such as a long-short-term neural network (LSTM), it is possible to build time-series models that map non-linear parameters that can be used for precise memory sequences. An increase in recognition is witnessed in the field of forecasting with a short-term demand. In the field of power system control, it is now considered important. When proper pre-data is available, precision results can be high. Here, we are employing long short term neural network to forecast the load of a sample household.
Key Words: Load Forecasting, PED, TEC, LSTM Load Forecasting, ANN, ARMA.

1. Introduction

For effective load forecasting of a concise region, previous data is necessary to understand the historical pattern. This estimation is done by employing time series, longitudinal data, or cross-sectional methods. To employ methods that require prior information to be handled, we use neural networks that can use historical data as a source for formulating better algorithms. One such network is a recurrent neural network (RNN). RNNs can remember the past data which can be used to make a decision or an arbitration by analysing the previously given information. Electrical load demand's prediction of a region that can vary from a few hours to few weeks is referred to as short term forecasting. In the past, there has been very few prediction models built for electrical load forecasting.

Most of the load forecasting has been built to predict a short-term output ranging around 2-3 week using Neuro-fuzzy logic, feed forward neural networks and basic support vector machines. An old methodology was also produced of algebraic modelling for comprehensive forecasting based on regression investigation that implemented a essential survey of the regular regression models, original algorithms, and results of combined classes is exponentially polynomial regression models (Mahendran, 2019; Aroulanandam, V. V., 2019). A few models using the ARMA and hybrid neural models have been employed.

For long time few models using the ARMA, hybrid neural models and fuzzy logic models have been employed. However, majority of the mentioned works employ a year on year resolution of Maximum energy demand (MED) or Total Energy Utilization (TEU) for prediction of load ranging up to a decade. Ascribed to the lack of observations, these estimations are insufficient for informed devising, planning and investing for the utility companies. Genetic algorithm (GA), a heuristic search and optimization technique imitates the procedure of calculation with the purpose to minimize or maximize some function. Nevertheless, majority of the mentioned works employ a yearly resolution of Maximum energy demand (MED) or Total Energy Utilization (TEU) for prediction of load ranging up to a decade.

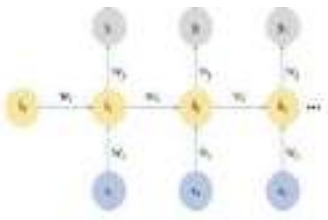

Figure 1: A Recurrent Neural Network

A scribed to the lack of observations. These estimations are insufficient for informed devising, planning and investing for the utility companies.

Calculation of minimization or maximization of some objective function can be used to find suitable number of lags (Kanaga, 2015;Shankar, 2020) for time series model. Contrariwise, medium and short-term forecasting was

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Research Article

Stability analysis of Automatic Voltage Regulator using Fractional Order Controller

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Abstract: We aim to design a fractional order robust control system. It is an advanced model of classic PID controller whose order will be non-integer.PID controller that we generally use has many advantages and disadvantages with respect to the disadvantages like, it doesn't give accurate values of constants, exact values of the time domain parameters as well as frequency domain parameters of the control system and we have more robust problem. Wearable electronic based an automatic voltage regulator can automatically preservesthe terminal voltage of generator at a fixed value under varyingly load and operating temperature. AVR controls output by sensing the output voltage at a power-generating coil and compares it to a stable reference. The combination of fractional order controller with an automatic voltage regulator is proved to be better than conventional controllers.
Key words: AVR, FOC, margins, PSS, IOPID

1. Introduction

Oustaloup is the pioneer in the field of fractional order calculus. It was also known as command robusted order non-entier (CRONE) controller. It is employed in contrastive feedback control systems. In the recent times podlundy a scientist introduced a generalized fractional PID controller called the fractional order PID controller that offers many advantages and advanced than the classic PID controller that includes λ (integrative action) and μ (derivative action) as integral and derivative constants. It has wider scope of design (White, 1997; Yang, 2006; Sampath Kumar, 2020; Samardzic, 2017; Murugan, 2020; Aroulanandam, 2019) this fractional order PID controller is a better solution for many industrial problems and some applications. Generalized FOPID IS

$$C(s) = K_P + \frac{K_i}{S^\lambda} + K_d S^\mu \quad (1)$$

The foremost work or intention of this FOPID controller is to find out those two constants and fulfill the additional specifications of the systems. Generally FOPID is represented as $PI^\lambda D^\mu$ when $\lambda = 1, \mu = 1$, one can get classical PID.

This FOPID increases the system total performance.

2. Design Specifications

The aim to design the controller is to achieve the various stipulation regarding sturdiness to plant load disorders, reservations, high frequency noise and frequency domain specifications. In general for any control system gain margin and phase margin are the signs of strength. Further phase of the system is mutually connected to the damping ratio, so it can also be treated as the performance measure (Subhransu, 2011; Duarte, 2015). This system rejects the output disturbances. Steady state can be terminated.

3. Comparison of PID and FOPID Controllers

The mathematical model of the conventional PID controller is.

$$K_P + \frac{K_i}{S} + K_d S \quad (2)$$

DC Side Controllers for Grid Connected Hybrid Renewable Energy Sources

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***Abstract*— *Renewable energy based grid connected systems are popular nowadays. The combination of more renewable energy based power generation sources can provide reliable power to consumers as well as to grid. The photovoltaic (PV) and PMSG based wind power generation systems are famous worldwide. However, the wind power depends on velocity of wind and PV power depends on solar irradiance. Hence power generation from wind and PV will be always fluctuating due to atmospheric and weather changes. These changes are rapidly changed and unpredictable, an energy storage device is required in order to minimize the fluctuations in power generation from PV and wind. Battery is the best and effective energy storage device to reduce the fluctuations in the system with proper controller. Compare to Proportional and Integral (PI) and Mamdani Fuzzy controller, Takagi Sugeno-Fuzzy (TS-Fuzzy) controller can work effectively for rapid changes in system. The TS-Fuzzy based DC side controllers are proposed in this paper. The battery is integrated to dc-link through DC to DC bidirectional power flow converter and its controller is developed to regulate the dc-link voltage as well as to operate the Maximum power point tracker (MPPT) converter of PV system. Extensive results are presented with MATLAB to test the controllers under different case studies.*

***Keywords*— TS-Fuzzy, Renewable Energy Sources, PV, Wind, Grid, Battery, MPPT**

1. INTRODUCTION

The utilization of renewable energy sources are increasing day-by-day. Since the attention towards increasing pollution and problems of fossil fuels, the researchers are working towards designing of renewable energy based electrical power generation systems from last decades [1-4].

The renewable energy sources based grid connected power systems are very much famous and required more research for better performance. Among many renewable energy based systems, a wind and PV systems are attracting researchers towards new inventions due to its utilization and benefits [1-4]. The PV and wind turbine connected electrical power generation systems are mostly using in grid connected systems. However, the generated power from both the systems is depends on weather changes and rapidly changes in nature [1-7]. Similarly the load is also intermittently changed due to need of customers. So, a device which can able to store the energy is required to compensate the electrical power generation by these renewable energy sources to minimize the effect due to rapid changes. The high energy density rechargeable batteries are commonly using as energy storage devices in such a power generation systems to achieve better performance under various conditions. The main challenges in this type of renewable energy sources based grid connected system needs to be operated with quality power under reliable power during all aspects with minimum operating cost.

The maximum power point tracer (MPPT) converter along with proper tracking algorithms needs to be implemented to operate system at high efficiency as well as the ability to deliver maximum availability power from the wind and PV [1-7]. By naturally, wind speed and solar irradiances are not constant always and depends on many factors and conditions. Hence, generated electrical power from wind and solar will be in fluctuating in nature, so that storage devices are needs to be used to stabilizing the electrical power between the generation stations and load especially under islanding mode in grid connected systems. High rechargeable batteries are suitable to charge from PV and wind as well as can able to discharge under deficiency of power to the load during islanding mode.

Many researchers are proposed similar kind of systems, however, the proposed controller is unique in nature to solve many issues occurred in grid connected system. Generally, proportional and integral (PI) based controllers are unable to solve the issues presented due to rapid changes from source and loads in grid connected renewable energy based hybrid systems. The proposed DC side controllers are designed by using TS-Fuzzy, it is having some significance over general or Mamdani Fuzzy [6, 9]. The detailed modeling, control strategies, system description and results under various conditions are discussed by following sections in this paper.

2. DESCRIPTION OF THE SYSTEM

The general block reprehensive diagram of grid connected hybrid PV-wind-battery based electrical power generation is shown in Fig. 1. The Permanent Magnet Synchronous Generator (PMSG) is coupled with wind turbine

Selection of Optimal Locations for Phasor Measurement Units (PMUs) using Analytical Hierarchy Process (AHP)

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Abstract: *With the increasing in the demand and the necessity for interconnections, the power system is growing in terms of its physical dimensions and its number of system operations. So, to handle the monitoring, protection and control of this highly interconnected power system, the demand for deployment of Phasor measurement unit (PMU) is rising like ever before. Hence, the optimal PMU placement (OPP) is gaining the popularity amongst the power system planning engineers. But, as the optimization would always results in multiple solutions, a decision making technique would definitely be required to identify the best solution set out of the multiple solution sets suggested by the heuristic or meta-heuristic techniques. This paper presents an application of Multi-Attribute Decision Making (MADM) method to identify the best solution for the given criteria.*

Keywords: Selection; PMUs, Multi-Attribute Decision Making (MADM), Attributes, Alternatives, Decision Matrix.

1. INTRODUCTION

The OPP, as it has a particular objective with operation-specific constraints, is actually an optimization problem. These optimization algorithms used for the placement of PMUs are generally of probabilistic and discrete type. So, the OPP problem has multiple solutions. It would be difficult for any utility to choose the best solution out of it. For this, here, an application of Multi-Attribute Decision Making methods is suggested. MADM is a branch of the Multi-Criterion Decision Making (MCDM) process. MADM is used in selection problems involving multiple alternatives. To select the best alternative, it suggests how the attributes can be processed. So, MADM is helpful in the evaluation to identify the best solution where as MODM helps only in designing [1].

From the inception of PMUs, for the power system operations such as observability [2-4], state estimation [5] and security [6, 7], there were many works using many optimization algorithms have been proposed. But, it is found that, the locations are multiple and different with the same number of PMUs.

Then, for the multi-constrained optimal PMU placement, the optimization techniques yield with more number of PMUs with increased computational time. And, it is complex to model multi-constrained objective function. Later, the additional constraints are modeled as the objective functions that were solved with a multi-objective optimization. But, as it involves the selection of Pareto fronts, this approach was proven to be expensive in terms of convergence. Further, it increases the number of PMUs and, also computational time. To avoid all these, this paper introduce the application of MADM to select the best solution from the available alternatives based on the different constrained modeled as attributes.

2. MULTI-ATTRIBUTE DECISION MAKING

The MADM, being a branch of Multiple-Criteria Decision Making (MCDM), enables the planners to identify the best solution for their-own constraints. The decision making involves choosing the best solution amongst the multiple solutions called *Alternatives* against goals or decision criteria called *Attributes* using an element-wise matrix called *Decision Matrix.*

Wide Area Power Systems Stability, Protection, and Security pp 127–166

Optimal Selection of Phasor Measurement Units

N. V. Phanendrababu

Chapter | First Online: 22 September 2020

471 Accesses | **1** Citations

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Abstract

Phasor Measurement Unit (PMU) is an important device for the power system operation as it provides the synchronized data required for the monitoring, protection, and control of the power system. So, to deploy the PMUs for the power system, their optimal locations are needed to be

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Research Article

A Novel Method for Electricity Generation from Footsteps Using Piezoelectric Transducers

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Article History: Received: 11 January 2021; Accepted: 27 February 2021; Published online: 5 April 2021

Abstract: The process of generation of mechanical energy of human footsteps and converting into electrical energy using piezoelectric transducer is discussed in this paper. This method of generation comes under the Energy scavenging section of renewable resources where wasted energy during regular processes such as heat during exothermic reactions is captured and converted. With the increase in energy consumption from handy electronic devices, the concept of harvesting alternative non-conventional energy in highly density population regions is a new interest of late. The model is a focused spring action between two tiles on to the piezoelectric transducers. This model contracts during a footstep and therefore allowing the mechanical input onto the transducers and converting this input into electrical output. This process is focused on footsteps upon multiple units across a pathway to generate maximum output with minimal monitoring. This type of generator is simply a secondary backup to coal or hydro power generation. The main feature of such generator is that this requires no conscious thought on the user's part.

Keywords*:* Piezoelectric sensors, Generation, Energy harvesting, PZT, Footsteps.

1. Introduction

New research for alternative energy sources has been of interest for the past decade on the eve of heavy decline in the fossil fuels. This research paved a way to rise of energy scavenging techniques (Songsukthawan, 2017). These techniques help us to capture and convert the dissipated energy from various chemical reactions or machinery processes. There are many energy scavenging techniques like capturing the surrounding heat during exothermic chemical reactions, heat dissipated during heat engines, lightning absorbers during lightning's strikes, vibration energy during heavy machinery. The main focus of our paper is to convert the kinetic energy from human footsteps into electrical energy.

This conversion is done by using the rack and pinion model consisting of a dynamo. Although this gives high voltages it is very expensive and cannot be applicable for multiple units, therefore this piezoelectric model is developed. This piezoelectric model consists of piezoelectric sensors made of lead zirconium titanate, which is the best man-made piezo electric material.

Piezoelectricity is a major principle in the energy scavenging sector due to its ability to convert any extreme pressures and kinetic movements into electrical energy

2. Piezoelectricity

2.1 Piezoelectric effect

The piezoelectric effect can be seen as a conversion between mechanical and electrical energies (Songsukthawan, 2017). When crystals of certain elements are exposed to mechanical pressure, an atomic deformation causing a shrink in the potential barrier is observed. This causes dipole transfer thus creating an electric field and producing the voltage difference

These materials are called piezoelectric materials and the effect is called direct piezo electric effect as shown in Fig.1 below.

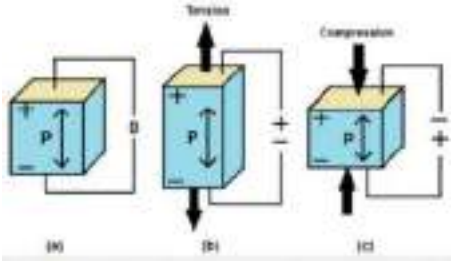

Figure 1. Direct piezoelectric effect

Turkish Journal of Computer and Mathematics Education *Vol.12*

A Simplified Control Approach of AC-DC-TLBC for Bi-Polar DC Mic Applications

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Article History: Received: 11 January 2021; Accepted: 27 February 2021; Published onli

Abstract: In this paper the main focus is to convert 3-Phase AC to DC and DC to 3-level Boost micro grid applications. The input side of AC-DC converter acts as active PWM rectifier and this c new Min Max (MM) control algorithm to maintain the regulated DC link voltage. The DC link volt the duty cycle along with voltage balance compensation algorithm in 3-L Boost (TLBC) converter. two control approaches can provide better dynamic and steady state responses and the output MATLAB /Simulink environment.

Keywords: 3-L Boost converter (TLBC), Pulse Width Modulation (PWM), Min Max (MM) c Controller (VBC).

1. Introduction

The integration of power electronic converters with non-conventional energy sour energy is rapidly increasing day-by-day (Zhong, 2013; Garikipati, 2021; Arunkarthikey the output voltage of a rectifier is controlled by Pulse Width Modulation (PWM) m harmonic distortion in the grid current and to achieve the bidirectional power flow in many control techniques being proposed. These control techniques helps to improv maintaining the regulated DC bus Voltage (Dubey, 2013; Pavan, 2020; Balamurugan voltage generated at the generating station is AC, which is given to the transmission s This rectifier circuit converts from AC voltage to DC voltage. To reduce the harmoni flow of kVAr and to improve the power factor of a system primarily depends upon rectifier circuit (ChinnamahammadBhasha, 2020, Deepthi, 2019; Balamurugan, 2017) ways, namely passive method and active method. The passive method consists of diode and capacitors. This circuit suffers from the limitations of low power factor and volt above a particular level (Takahashi , 1995; Arunkarthikeyan, 2020). The Active meth elements like IGBTs (ChinnamahammadBhasha, 2020). The moderate value of switc obtain the power factor of the sinusoidal current nearer to unity and to reduce the input efficiency decreases (Hui, 2000; Tavakoli, 2016; Balamurugan, 2018). Many contro

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In Press, Corrected Proof

Non-intrusive load monitoring technique using deep neural networks for energy disaggregation

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https://doi.org/10.1016/j.matpr.2021.01.192

Abstract

Households have increased energy usage in recent years to exceptionally high levels, where it is not feasible anymore. Owing to increased usage of power, there is a desperate need to find a way to use resources more sustainably. One of the key reasons why energy use is not sustainable is because the consumer does not know anything about the energy consumed by intelligent devices (dishwasher, refrigerator, washing machine etc). By letting household users know the energy consumption of intelligent devices. For energy monitoring firms, the energy used by the smart devices in a household needs to be analysed. In the presence of vampire loads such as electric heaters, we use deep neural networks to disaggregate the energy use of the dishwasher in a household. The training times of the deep neural networks are also being attempted. The object of the work is to calculate the efficiency and potentiality of deep neural networks on Non-intrusive load monitoring (NILM). In addition, the essential metrics chosen are RMSE and F1 in order to determine the efficiency of the proposed algorithms. Hence, from our research, we concluded that Gated recurrent Unit (GRU) is, in the presence of vapour loads of households, the best efficiency algorithm in our study, which breaks down the energy consumption of the dishwasher. GRU is however the strongest neural network when the RMSE and F1 scores are known as the metrics. However, if we take training time as the metric, we can take the best training time, that is, 19.34 min, as a simple recurrent neural network.

Keywords

Deep learning; Non-intrusive load monitoring; Disaggregation

Revelation and Defense against Overlapping Secondary User Attack using H Infinity Filter in the Cognitive Radio Network

G. V. Pradeep Kumar, D. Krishna Reddy

ABSTRACT

In the current past, the development of new wireless techniques has incited the change of innovative systems in wireless correspondences, which has made the scope of dearth. This impediment is vulnerable as wireless correspondence, which mostly relies upon scope of usage. Cognitive Radio (CR) is proposed as a capable counter for feasible and profitable use of the unutilized spectrum in an appropriate approach by refining the spectrum usage range through opportunisticspectrum range sharing.

In the CR approach,the secondary user attack is discardedand,the spectral properties in energy distributioncan be accessed. Amalicioussecondary user creates a jamming signal andgoes as aprimary user. The secondaryuser attack in the perspective of the wavelet thresholding plan is analyzed. The jamming signal produced by the secondary user is removed by using a filter.

The proposed approach begins withenergy recognition to locate the present users on the frequency band. The approach uses a jammer signal as asecondaryuser attacked signal, which is then energized into Kalmanfilter and Hinfinity filters for de-noising approach. As conflicting to current techniques for perceiving primary useremulating attacks in CR, our proposed method does not require a special hardware or time synchronization calculations in the wireless system. It works in the perspective of the wavelet thresholding approach. Wavelet thresholding approach uses effective utilization of beneficiary beyond any doubt thresholding plan, less computational multifaceted design for pernicious disclosure. The proposed approach relies upon the H-

A Crystal view on Brain Tumor Detection Methods

Satyavati Jaga, Dr.K.Rama Devi

Keywords: Brain Tumor Detection, brain tumor databases, Magnetic Resonance Imaging, Medical Imaging.

ABSTRACT

The abnormal tissue development within the brain that prevents its activity is conceived as a brain tumor. The exact identification of brain tumors is a significant diagnostic trait. In this document, the advantages and disadvantages of newly arrived brain tumor diagnostic approaches are explored. A standardized flow chart is proposed that is commonly suitable for the assessment of brain tumors. Numerous beneficial databases are mentioned, which are widely accessible for brain tumor algorithms. Recent literature arrivals are contrasted with their performance in terms of precision, sensitivity, unique design, and time usage. Guidelines are finally rendered with reasonable effort to classify brain tumors according to existing study criteria with good quality.

Speaker Recognition through Effectively Configured Artificial Neural Network

Namburi Dhana Laksmi, M.Satya Sai Ram

Keywords: Speaker recognition, Artificial Neural Network (ANN), Mel-Frequency Cepstral Coefficient (MFCC), Particle Swarm Optimization (PSO), Linear Prediction-filter Coefficients (LPC).

ABSTRACT

The purpose of work to recognize the speaker's voice through Artificial Neural Network (ANN) in associate with Particle Swarm Optimization (PSO) for identifying appropriate weights for ANN. The preliminary research extracts feature from the signal with the aid of Linear Prediction-filter Coefficients (LPC) and Mel-Frequency Cepstral Coefficient (MFCC). The extracted features can be used as input parameters for the ANN technique; subsequent, the research aims to identify appropriate weights for performance enhancement. Determining the appropriate weights through manual or trial-and-error process consumes a long time, to resolve the study incorporates optimization techniques. The performance of employed techniques evaluates through various measures, the outcome evident the superiority of the anticipated technique over contest techniques.

Design and Simulation of Area Efficient Carry Select Adder using Verilog HDL

Kamlikar Sowmya, Alenoor Krishna Kumar

Keywords: Ripple Carry Adder, Square - Root CSLA, Carry Generation unit, Carry Select unit.

ABSTRACT

In this paper, an Area efficient Carry Select Adder (CSLA) design is Proposed. The Conventional design of carry select adder is faster in comparison with ripple carry adder (RCA) however Conventional CSLA requires larger area. The increased area in conventional CSLA is due to replication of ripple carry adders and presence of multiplexers. In this paper, the analysis is made on the logic operations that are involved in Conventional CSLA and Published CSLA (Base Paper's CSLA) to identify redundant logic operations. Gate level reduction approach is made, to remove redundant logic operations and to reduce the total area required for the proposed design. In Published CSLA the logic operations are represented in 4 units i) Half Sum Generation unit (HSG) ii) Carry Generation unit (CG) iii) Carry Select unit (CS) iv)Final Sum Generation unit (FSG). In Proposed design, the CG and CS units are combined by removing a number of redundant logic gates and thereby gate count is reduced and hence area reduced. Proposed CSLA when compared with Conventional CSLA there is 25.6% reduction in area and when compared with Published CSLA the area reduced is 6%. The results of Proposed design proves that the design is efficient in terms of Area. The design is simulated and synthesized in Xilinx ISE 14.7 software using Verilog HDL.

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IRNSS BASED ESTIMATION AND MITIGATION OF MULTIPATH ERROR FOR STRATEGIC TERRESTRIAL APPLICATIONS

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ABSTRACT

Indian Regional Navigation Satellite System (IRNSS) is the emerging satellite based navigation system developed by Indian Space Research Organization (ISRO). The performance of IRNSS is limited by several errors including multipath, ionospheric error, tropospheric error etc. Multipath error becomes serious degradation factor on limiting the performance of IRNSS especially in urban environment. Estimation and mitigation of this induced multipath error improves the positional accuracy of IRNSS. In this paper, multipath error is estimated and analyzed on the data acquired from dual frequency IRNSS receiver in static urban environment. In this investigation, Code Minus Carrier (CMC) technique is implemented for estimating the multipath error. To mitigate the estimated error, LMS filter an adaptive filtering technique is considered. The results have proven that the multipath error is reduced by 99.99% on L5 and 99.99% on S1 frequencies.

Key words: Navigation, IRNSS, Multipath Error, Positional accuracy**.**

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1. INTRODUCTION

IRNSS (Indian Regional Navigation Satellite System) is the emerging independent and indigenous satellite based regional navigation system developed by Indian Space Research Organization (ISRO). IRNSS with operational name Navigation with Indian Constellation (NavIC) consists of seven satellites. Out of which, 3 satellites are placed in Geostationary Orbit (GEO) at 32.5°, 83° and 131.5° E with small orbital inclination angle of about ±5˚ to mitigate the effect of Doppler collision. The remaining 4 are geosynchronous satellites (GSO) inclined

Journal of Communication Engineering and Its Innovations

Open Access Subscription Access

Smart Helmet for Soldier Protection in War Field

M. L. N. Acharyulu, Sharma Karthik, Harsha Vardhan, Murali Krishna

Abstract

This paper deals with a Zigbee-based status monitoring and tracking system for soldiers. The goal of this paper is to create a gadget that will allow the base station to keep track of all of its soldiers' status and specific whereabouts, as well as assist them in difficult situations. As a result, this technology will aid in the saving of many troops' lives. In today's world, when the human race is attempting to develop sophisticated technology to make our jobs simpler, troops, who are the most essential element of the nation, are still unable to make significant progress. Soldiers are the backbone of a nation's security, and the nation's and people's conditions would be unfathomable without them. However, it is still unable to offer them security. When a soldier is sent to a war field we must be able to assist soldiers in problematic situations. For that, the base station should use advanced technologies. The proposed system can be mounted on the soldier's helmet to track their status and current location using GPS. This information will be transmitted to the control room through the Zigbee module. In this paper, GPS technology is used which will help to send messages to the base station in the real-time scenario. Different sensors are used such as helmet monitoring IR sensor, Air quality sensor, and helmet collision sensor which will keep track of soldier's status. The output of the different sensors can be read which will ease the monitoring of soldiers. The proposed model comprises tiny wearable physiological equipment, sensors, and transmission modules. Hence, with the use of the proposed equipment, it is possible to implement a low-cost mechanism to protect valuable human life on the battlefield.

Full Text:

PDF

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Fast Diffusion Minimum Generalized Rank Norm Based on QR Decomposition

Sowjanya Modalavalasa, Suraj Prakash Sahoo, Upendra Kumar Sahoo, and Ajit Kumar Sahoo , *Member IEEE*

***Abstract*—The outliers or impulsive noise is prominent in practical wireless sensor networks due to saturation effects, nonlinearities, malfunction of sensors, environmental abnormalities, etc. The classical diffusion algorithms based on mean square error cost function are sensitive to outliers and their performance degrades in the presence of outliers in either desired data or the input data. A fast diffusion minimum generalized rank norm based on QR decomposition (FDGR-QR) is proposed, which is robust against outliers in both desired and input data and has faster convergence than the state of the art algorithms. Different outlier percentages distribution across the network is considered for the simulations based experiments. The proposed algorithm is validated for both stationary and non-stationary parameter estimation scenarios.**

***Index Terms*—Diffusion strategy, Generalized rank norm, Impulsive noise, QR decomposition**

I. Introduction

THE problem of distributed adaptive estimation of system parameters via connected sensor network is one of the challenging tasks in the signal processing society. The distributed estimation techniques have a lot of real time applications ranging from precision agriculture to integrated target surveillance [1]. The least squares based classical distributed algorithms [2], [3] are simple and effective, but they are not robust against outliers/impulsive noise. Their performance degrades drastically in impulsive noise environments, since the underlying signal violates the theoretical assumptions considered for the development of such algorithms. Impulsive noise/outliers may occur due to multipath telecommunication signals, co-channel interference, saturation effects, nonlinearities in practical systems and node failures [4], [5]. To handle the outliers, many robust techniques based on robust statistics have been proposed in the literature. The robust distributed algorithms based on Huber loss [6], error nonlinearity [5], Wilcoxon norm [7], least logarithmic absolute difference [8], Lorentizian norm [9], information theoretic learning [10], [11], least mean p-power [12], general mixed norm [13] and minimum disturbance principle [14] have been found to be robust against outliers in the desired data. However all the aforementioned algorithms have been designed to exhibit robustness against impulsive contamination in the desired data only and they fail if both the desired and input data are contaminated with outliers [15]. In practical scenarios, both the input and filter output/desired data could be contaminated with outliers [15], [16].

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To handle outliers in both desired and input data, different generalized rank (GR) norm based techniques [16], [17] are proposed in the literature. The diffusion GR norm algorithm [16] performs well by overcoming the shortcomings of the incremental strategy proposed in [17]. This method optimizes the GR norm based cost function, where the adaptation is based on the error obtained at current time i. The gradient decent approach is utilized to perform adaptation, where the initial weights are assumed to be close to zero and updated by using the gradient of the cost function. Hence, the algorithm in [16] exhibits slow convergence rate. From the literature [3], [18], it is found that robust diffusion GR norm based methods with enhanced convergence speed can also be the solution in handling impulsive contamination. To achieve this goal, a fast diffusion GR norm based on QR decomposition algorithm (FDGR-QR) is proposed in this paper. In our proposed technique, the adaptation procedure utilizes total error computed from the beginning to current time i. Motivated from [3], [18], the cost in the proposed FDGR-QR algorithm is minimized by appropriately selecting the filter coefficients and updating them when new data block arrives. It utilizes QR decomposition and Householder transformation. The forgetting factor used in the cost function decides the weightage given to the older data samples. The better convergence speed of the proposed FDGR-QR method is obtained due to the consideration of total error based cost function and better choice of initial weights obtained from the QR decomposition of data matrix. Hence the proposed FDGR-QR exhibits better convergence speed and robustness against outliers in both input and desired data. As per our knowledge, none of the available QR based RLS techniques [3], [7], [19], [20] are robust to outliers in both input and desired data. The proposed algorithm differs from current available methods by optimizing the pseudo least squares formulation of GR norm using QR decomposition technique and block House holder transform. The main contributions are:

- Motivated from [16], we propose pseudo least squares formulation of GR norm, which is robust against outliers in both input and desired data, since its influence function is bounded in both input and desired data space.
- To ensure faster convergence speed and stability under finite precision environment, we propose FDGR-QR algorithm, where the QR decomposition of the augmented input data matrix is combined with back substitution procedure. The overall triangularization procedure is obtained by utilizing the numerically well conditioned Householder transformation.
- The proposed algorithm is investigated in both stationary and non-stationary scenarios and a comparison with the

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Multi-Band Multi-Functional Metasurface-Based Reflective Polarization Converter for Linear and Circular Polarizations

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ABSTRACT In this paper, we present a simple metasurface based multiband reflective polarization converter for both linear and circular polarizations. We show that, on one hand, the proposed structure can convert the polarization of linearly polarized waves to the orthogonal direction at four frequency bands — 4.3 GHz, 7.2 GHz, 12.3 GHz, and 15.15 GHz. On the other hand, this metasurface can achieve linear to circular or circular to linear polarization conversion at 4 GHz, 4.75–5.95 GHz, 8.35–8.8 GHz and 14.35–14.6 GHz frequency bands. Such multiband operation originates from multiple resonances occurring in the structure based on meandered square ring and diagonal split strip resonator. Moreover, the polarization transforming capability is stable for oblique incident angle up to 15^o, for both transverse electric (TE) and transverse-magnetic (TM) polarizations. Furthermore, the proposed structure acts as a meta-reflector that maintains the handedness of the circular polarization upon reflection. Finally, a prototype of the proposed meta-structure is fabricated and measured for both normal and oblique incidence of electromagnetic waves. All the results present excellent resonant stability with respect to the different polarization and incident angles. In addition, we have also performed the tolerance analysis of different material parameters to understand the robustness of the structure. Due to the ability of the structure to perform three functionalities through a single layout, the proposed design can pave its way in different microwave applications such as satellite, radar, and 5G communications.

INDEX TERMS Polarization converter, multi-functional, multi-band, linear polarization, circular polarization.

I. INTRODUCTION

Metasurfaces, also known as two-dimensional metamaterials, are sub-wavelength artificial structures that are used to modulate the propagation of electromagnetic (EM) waves. Due to its unconventional ability to achieve unique EM properties, metasurfaces have received huge recognition in the past decades. Such manipulation of EM waves has led to diverse applications such as absorber [1], [2], cloaking [3], [4], lensing [5], [6], and polarization converter [7], [8], which are greatly influencing our day-to-day lives. Particularly, the metasurface based polarization converter are used in several application such as controlling the polarization of radiating wave [9], [10], and radar cross section (RCS) reduction [11], [12], etc. In [9], a metasurface is used over the linear polarized slot antenna to convert the polarization of radiated wave. Similarly, a mirror polarization conversion metasurface is used in [10] for manipulating the polarization of the radiated wave. Beside these, different arrangement of the polarization converting metasurface can also be used to reduce the RCS of any object [11], [12].

Polarization converters are devices that can change the polarization state of an EM wave. Before the advent of metasurfaces, researchers proposed devices made of natural materials using optical activity crystals or Faraday effects. However, such approaches are bulky in nature and required

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Encrypted e-Voting System using IoT

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Abstract: ***Elections make a fundamental contribution to democratic governance but a lack of trust among citizens on their electoral system is a hindrance to satisfy the legal requirements of legislators. Even the world's largest democratic countries suffer from issues like vote rigging, election manipulation and hacking of the electronic voting machines in the current voting system. To provide data security for e-Voting systems, the advanced encryption standard (AES) algorithm has been proposed, but traditional AES gives the same ciphertext for every similar pair of key and plaintext. So, to eliminate these disadvantages, AES in Galois-counter mode (GCM) has been used to obtain different ciphertexts all the time by using Initialization Vector. The fingerprint data from each user is verified using Internet of Things (IoT) based Biometric system which also helps to avoid Plural Voting. The whole data is encrypted and stored in the cloud, and it can be decrypted by authorized personnel to obtain the final vote count. So, the proposed model will enhance transparency and maintain anonymity of the voters alongside providing an easily accessible secured voting system.***

Keywords: Advanced encryption standard, initialization vector, additional authenticated data, galois-counter mode, biometrics, security, ciphertext, authtag

I. INTRODUCTION

Election is the symbol of democracy and people have the complete freedom to select a visionary leader. The process of election involves people voting for a candidate and the candidate who obtains a major share of votes is declared to lead the people. Paper ballots have been the most common form of voting, but there were cases of vote rigging and plural voting in this method. About 10% of the countries have implemented electronic voting machines (EVM), but it is found out that the EVM's are prone to tampering [6]. So, to secure the data generated from the voting process, the Data encryption standard (DES) algorithm, with a 56-bit key length, was used to encrypt the data. But, with the rapid growth in technology and computational resources, it was confirmed that the DES algorithm is no longer reliable to handle immensely valuable data that is used in the voting process. The successor algorithm for DES, the Advanced encryption standard (AES) algorithm ensures additional layers of security, and thus, the algorithm is preferred for encrypting the data. It is a symmetric block cipher that takes plain text in blocks and converts them into ciphertext. It is found that AES is at least six times faster than triple DES and allows choosing a key of variable length (up to 256-bits) as compared to a fixed key length of 56-bits in DES, thus making it highly robust.

The issue with using a traditional AES algorithm is that it produces the same output for a given pair of input and secret key. This is an undesirable feature, especially when voting is limited to a finite number of parties and it is highly likely that the same party can be voted multiple times. For example, if 10 persons have casted their vote for "Party-1", the input plaintext is the same for all these 10 cases. As the key also remains the same, the output of traditional AES algorithm is the same. It becomes easy for an intruder to analyze ciphertexts and any repetition of certain text in the ciphertexts can lead to attacks. So, it is found necessary to obtain different ciphertexts even if the pair of plaintext and secretkey remain the same. AES algorithm operating in Galois-Counter mode (GCM) has been proved to be suitable in this context. It provides authenticated encryption of data. It also supports pipelining and parallelism which makes it a suitable choice for using in the e-Voting process.

II. LITERATURE SURVEY

Alex Halderman et al. [1] has stated that the electronic voting machines lack the security features and are prone to serious attacks which can be potentially difficult to trace. The main drawback of EVM is that it does not provide information as of when the tampering is done or if the EVM has been tampered or not. So, the paper states the need for encryption which can ensure proper security of data in the EVM's. Also, the need for regular software updates for EVM's is stated.

Shilpa C Venugopal et al. [2] has proposed the use of a customer identification number along with biometrics to validate the voters. The biometrics are stored in the database against the identification number during enrollment process. During verification, the user's biometrics are matched with the existing template in the database. The results of election are stored in the cloud using IoT.

Lalit Kumar Gupta et al. [3] has proposed that the current DES encryption algorithm that is being used for encrypting data generated by the election process has become more vulnerable because of its smaller degree of encryption.

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A Novel Triple Band MIMO Antenna Array for Simultaneous Communications

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Investigation of Congestion Predictor with Supervised Learning for Routability-Driven Global Routing

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Abstract

Routability in physical design has reached a snag since traditional routers' congestion estimates aren't up to pace with today's advanced routing characteristics. Several approaches based on supervised learning have recently been developed to anticipate routability information. However, the characteristics retrieved using these approaches are relatively crude in terms of reflecting actual physical attributes. Furthermore, a lack of global knowledge causes global routing performance to deteriorate. In this work, we present a supervised-learning regression model capable of capturing correct global routing patterns in this article, which is used to train a congestion prediction model to enhance global routing. In comparison to traditional global routing-based congestion estimates, experimental findings demonstrate that our predictor is at least 10.33 times quicker in execution while retaining an accurate forecast. Furthermore, by including our model into the router, we can obtain not just a better routing topology, but also a higher quality of performance.

Full Text:

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Research Article

Implementation of SVM machine learning Algorithm to predict lung And Breast Cancer

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Abstract: The proposed work will be implemented and developed. Related to learning algorithms the support vector machine is under supervised learning algorithm. To predict cancers like Breast and lung cancers so many statistical and Machine learning models are there, but out of all available models the super vector machine algorithm is best. Maximum edge of SVM hyperplane and edge prepared in 2 class test. To build an SVM classifier, you first need to define a kernel function. The predicted performance of A may vary. However, there are various studies investigating the characteristics of SVM predictions based on various factors. The proposed model is fully analyzing the predictive performance of SVMs and SVM sets and comparing training with large and small lung cancer datasets with 99.52% accuracy, roc 0.876, and major f 0.996%. SVMS and SVM set time..

Keywords: SVM, accuracy, ROC and F-measure, AI, ML

1. Introduction

Among various diseases, cancer poses a great danger to people around the world. According to the Indian Census, cancer deaths in India were high, causing an alarming number of about 806,000 cases by the 21st century. And it has the highest mortality rate. This is due to the limited potential for prevention, diagnosis and treatment of the disease. All types of cancer have been reported in the Indian population, including cancers of the skin, lungs, breasts, rectum, stomach, prostate, liver, cervix, esophagus, bladder, blood and mouth. The high incidence of this type of cancer is due to internal factors (genetic, mutational, hormonal, immunodeficiency) and external or environmental factors (dietary, productive, population growth, social, etc.). It can be both. Comparison of various cancer cases in India and around the world. In addition, attempts have been made to explain the main causes of cancer and how to prevent it. In addition, efforts have been made to predict the impact of rising cancer rates on the Indian economy.

1.1.Cancer scenario in India:

Based on the increasing trend of cancer patients over the last few decades, it is expected that there will be cancer patients in India by the end of 2015 and 2020. These aggregates were 390,809, 428,545 and 819,354 in 2004, respectively. The number of men and women with cancer continued to grow until 2009, with the numbers of men, women, and all cancer patients at 454,842, 507,990 and 96, 2,832, respectively. Similarly, 462,408 male and 517,378 female cancer patients were enrolled, bringing the total number of patients in 2010 to 979,786. Therefore, this number indicates that the number of cancer cases is gradually increasing over time. We also forecast the number of cancer patients in 2015 and 2020, respectively. There are different types of cancer in India, including lung cancer, breast cancer, stomach cancer, gallbladder cancer, cervical cancer, oral cancer, and different types of cancer.

1.2.Indian states and cancers:

The most affected states of India are Jam and Kashmir, Himachal Pradesh, Delhi, Uttarakhand, Rajasthan, Maharashtra, Jharkhand, West Bengal, Andhra Pradesh, Kerala, Tripla, Manipur. The state from this figure, cervical cancer is the second most common cancer in the women's population of Himachal Pradesh, Haryana, Rajasthan, Goa, Tamil Nadu and West Bengal, among women in Punjab and Andhra Pradesh. It is clear that it is the third most common cancer. -Pradesh and Uttar Pradesh. Breast cancer is the most common cancer in women in Himachal Pradesh, Delhi, Rajasthan, Nagaland and Goa, and the second most common cancer in women in Punjab, Maharashtra and Gujarat.

1.3.Cancer causes in India:

The causes of cancer in India are similar to those in other parts of the world. Chemical, biological and ecological identities are responsible for the uncontrolled and chaotic growth of (cancer) cells. In fact, carcinogens interact with normal cellular DNA under special conditions, initiating a series of complex multi-step processes that lead to uncontrolled cell or tumor growth (Carmaia, 1993). Cancer can be caused by intrinsic factors such as genetic variation, hormones and immune status, as well as environmental factors such as tobacco, diet, radiation and other infectious pathogens. Significant changes in cancer incidence due to lifestyle and diet have been reported (Hel bock et al, 1998). For example, Asians are 25 and 10 times less likely to develop prostate and breast

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Content Based Image Retrieval System Using Integrated ML and DL-CNN

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Abstract
In this article, content-basedimage retrieval (CBIR) system is developed since it has significant scope for research in image processing domain. In CBIR, visual contents are being used to search an image from a huge scale image database as per users interests and based on automatically derived query image features. The term 'content' might refer to low level features like color, shape or texture extracted from the image. Several research challenges can be addressed towards the design and development of CBIR systems, very few techniques are available to address and solve the problem of semantic gap presented in images which are not efficient.Themachine learning (ML) method has investigated as a practicableapproach to decrease the semantic gap. Also motivatedfrommodernfulfillment of deep learning for image processing applications, we focused to deal with an artificial intelligence based deep learning approach, treated as Convolutional-Neural-Network (CNN), for the purpose ofsimilarity measurement of accuratesemantic features. In this article, the usage of CNN for the image retrieval issues is investigatedwith their solutions using deep learning approaches.Further, it is also incorporated with principal component analysis (PCA) for extracting salient features from the images. Euclidean distance measurement is employed for the similarity evaluation of extracted feature vectors of query image and database images. Extensive simulation results on different image categories discloses that proposed DL-CNN-ML outperforms existing CBIR approaches like ML and CNN in terms of mean average precision (AP), mean average recall (mAR) and F-score values.

Keywords: content-based image retrieval, feature extraction, machine learning, deep learning, principal component analysis and convolutional neural networks.

I. INTRODUCTION

In current days, there is a quick improvement in picture search situations, for example, Google's picture - search, Microsoft's CBIR innovation, Bing CBIR instrument, and note: does not deal with all pictures (Public Company), CBIR internet searcher, by Gazopa (Private Company), Imense Image Search Portal (Private Company) and Like.com (Private Company), picture recovery has become a difficult assignment. The enthusiasm for CBIR has developed in view of the recovery issues, confinements, and time utilization in metadata-based frameworks. We can look through the printed data effectively by the current innovation, however this looking through strategies expects people to portray every picture physically in the database, which is unimaginable for all intents and purposes for exceptionally gigantic databases or for the pictures which will be produced consequently, for example pictures produced from reconnaissance cameras. It has more disadvantages that there is an opportunity to miss pictures that utilization distinctive proportionate word in the depiction of pictures. The frameworks dependent on arranging pictures in semantic classes like "tiger" as a subclass of "creature" can suspend the miscatergorization issue, however it will require more exertion by an utilization to recognize the pictures that may be "tigers", yet every one of them are sorted distinctly as a "creature". CBIR is a use of techniques for obtaining, pre-preparing, investigating, portrayal and furthermore understanding pictures to the picture recovery issue, that is the issue of investigating for advanced pictures from enormous databases. The CBIR framework is against conventional methodologies, which is

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Research Article

Plant Disease Classification using Residual Networks with MATLAB

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Abstract

In a developing country like india, agricultural production mainly depends on smallholder farmers and more than 50% yield loss due to pest and various diseases affected by plants. Diseases can be managed by identifying the diseases as soon as it appears on the plant. In addition, the digital era makes the diagnosis information of any disease available at the fingertips. In other words, smartphones with high resolution cameras can aid in identification of a plant disease through images and thereby help in early diagnosis of the disease. This paper makes an attempt at resolving the present problem of undiagnosed plant diseases using Deep Learning for detecting and classifying the plant diseases using images of the plant. This helps the farmers to take necessary action to avoid the disease from aggravating without having to wait for an agriculturist to identify and resolve the problem.

In a nutshell the paper aims at designing a Deep Learning model for the classification of an image of plant disease. The algorithm makes use of a Convolutional Neural Network with Residual Network architecture, commonly known as ResNet using Matrix Laboratory (MATLAB). The model will be trained using a public dataset of 54,305 colour images of diseased and healthy plants which when segregated result in 38 classes.

Keywords:Plant Disease, Images, Convolutional Neural Network, Residual Network, MATLAB.

Introduction

Research states that there is enough food being cultivated to feed the world yet, there are considerable people in various parts of the world who sleep with an empty stomach. According to recent reports, 14.8% of the Indian population is malnourished [1]. One of the most important factors that acts as a threat to food security is undiagnosed plant diseases. In addition to affecting food security they also pose a threat to the livelihood of small household farmers. It has been noted that when these plant diseases are identified at an early stage, the damage caused by the disease can be stopped from aggravating. In the recent past, with the widespread availability of access to the Internet, efforts to manage plant diseases have been supported by making information regarding diagnosis at each stage of the disease, available online. With rapidly changing technology, high resolution cameras have far-reaching effects in identification of a plant disease through images [2].

With a considerable understanding of the layers in a convolutional neural network and its architectures, it would be ideal to discuss the methodology followed to build the network and get the intended results. The steps essential in any machine learning or deep learning algorithm are preparing the database, deciding on the architecture, training and hyperparameter tuning to obtain the best possible set of metrics. These steps have been discussed in detail in the subsequent sections.

Today, AI has become an integral part of people's lives. With the help of these Deep Learning techniques images can be classified with minimal or no pre-processing required because of which Deep Learning has an edge over machine learning. Classification can be of two types, supervised and unsupervised. The paper aims at classifying images using Supervised Learning [3]. The process of classification involves two steps, namely, training and testing. Training process involves validation as well where the trained neural network is tested with a set of unseen images. Validation step helps avoid overfitting and sampling imbalance. The training process extracts characteristics of images belonging to a class and associates them as properties characteristic to that class. This process of extraction of properties is followed for each class depending on whether it is a binary-class classification or multiclass classification[4]. In the validation step, the trained network is used to classify images it had not been trained on. If considerably high, performance metrics such as accuracy, precision and recall are obtained, it means that the network can deployed for usage. Else, the training process must be re-initiated by passing different values to parameters such as mini-batch size, number of epochs, type of optimizer, learning rate and so on. The cycle of training and validation is followed until the desired accuracy, recall and precision are obtained[5]. This process of changing parameters to obtain better performance metrics is known as hyper-parameter tuning. Finally, the trained network is tested on the test dataset.

There are quite a few architectures in Convolutional Neural Networks that are very different and upon closer inspection it has been observed that Residual Neural Networks seem to make training easier and accurate using identity propagation [6].

The paper is organized into sub-topics that give an insight into how the database was prepared, trained and


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A Virtuous Reckoning on security enhancement of mobile Adhoc network using artificial intelligence
A.Vani
PDF
Abstract
Mobile ad hoc networks (MANET) have revolutionized our culture through their self-configured autonomous communications nodes that have no framework and have thus been aimed at exploring means of making good use of the potentials of MANETs, more and better. The latest introduction of new machine learning technology has enabled the creation of the best protocols for artificial intelligence. Mobile ad hoc networks (MANETs) face different problems related to protection caused by malware attacks. Its transient existence makes nodes more sensitive to threats by nodes or by attackers as any node acts as a router to transfer data without centralized control. Therefore, to identify the wrong entry of misbehavior nodes, MANET requires very precise security policies. The networks perform better if the nodes are confident and cooperate correctly. This
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Deplete And Discernment Of Security Hazards In Mobile Ad-Hoc-Networks (Manet) Using Artifical Intelligence

A.Veni

PDF

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Section
Articles

Abstract

MANET which have been autonomous and conscience may be adopted to any scenario. The configuration of these network nodes is complex in the ad hoc networks and this fundamentally changes the interdependencies among them. The network devices connected to these mobile nodes need to link, execute, and make routing that provides high levels of performance and resistance to any risks and security issues that could emanate from the network easier for this integrity of deployment. Artificial intelligence technologies may be provided to provide and manage a stable and safe infrastructure for the MANET to run. This paper explores in particular how AI techniques can be used for safer routing and networking between mobile dynamic nodes in MANETs. The paper examines different types of threats facing MANETs and different routing protocols that

Make a Submission

Progress In Electromagnetics Research M, Vol. 99, 23–34, 2021

Analysis of Correlation between ROTI and S_7 Using GAGAN Data

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A Novel Approach of ONOFIC Method to the Minimization of Leakage Power in CMOS Circuits

M. L. A. Acharyulu, K. Suhitha Lakki Reddy, B. Haripriya, G. K. Sai Teja

Abstract

This paper deals with the leakage power problem in CMOS circuits, most of the time maximum power dissipation in the case of batteries using applications effected by varying the parameters like cost and reliability, etc. in this maximum power dissipation cases which is leakage power is a major parameter in design aspects. The proposed technique is to reduce the power leakage in CMOS circuit design. In this paper, it highlighted those universal logic circuits and other logic operations to exhibit the effect of power leakage reduction in the CMOS circuits we proposed ONOFIC method has comparatively good results with conventional techniques like LCNT and LECTOR all logic circuits have stimulated by using the tanner tool Nanometer technology.

Full Text:

PDF

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ABUl TACl

Automated monitoring of crop type statistics, is useful in determining the import needs of a country. For instance, if crop area of Onion, is relatively less in a year, then government can plan for importing onions, when onions price is low in the world market. The project aims at analyzing the satellite images, and calculating the crop areas.

The project has three modules: CAI (Crop Area Image) module is used to provide the satellite images, as input to the system. AD (Area determination) module is used to analyze the image, and determine different crop areas. Reporting module is used to generate the crop statistics report.

Image processing technique has been proved as effective machine vision system for agriculture sector. The statistics report can be further visualized in the form of graphs for effective interpretation. Thus, this approach helps to save the environment as well as the cost. Thus, we can conclude that image processing as the most efficient and effective tool that can be applied for the agriculture sector with. great accuracy for analysis of agronomic parameters.

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Optimized adaptive neuro fuzzy inference system (OANFIS) based EEG signal analysis for seizure recognition on FPGA

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ABSTRACT

The activities of the human brain can be affected due to certain neurological disorder called seizure. Generally, the epileptic abnormalities can be identified by direct visual scanning. But this scanning consumes more time, and it is limited due to some technical artefacts. Hence, there is a necessity of an efficient computer-aided diagnosis (CAD) system for distinguishing the seizure signals from non-seizure signals automatically. In this paper, an Optimized Adaptive Neuro Fuzzy Inference System (OANFIS) classifier is proposed to detect the seizure automatically. The main aim of this work is to increase the accuracy of the classifier with less computational complexity in terms of area and power consumption. The proposed system initially extracts the features of the FIR filtered EEG signal using Discrete Wavelet Transform (DWT). Then, these features are learned by the proposed classifier, which improves the classification accuracy by selecting the optimal features using Binary Particle Swarm Optimization (BPSO) algorithm. To provide convenience and compactness, the proposed system is implemented in Xilinx working platform by developing Verilog code. The simulation outcomes demonstrate that the proposed system overtakes the existing approaches by achieving the classification accuracy of 99.25 % and consuming only 2.018 *W* power.

1. Introduction

A neurological illness that affects about one percent of human in the world is known as Epilepsy. Irregular electrical activities in the brain can cause this epilepsy illness [1]. Seizures are difficult to detect even for a talented person in the anatomy who trust in the visual scan of clinical manifestations and electroencephalogram (EEG) recordings. EEG signal is mainly used to determine a patient with seizure [2]. It assesses the patient s brain waves for around 20 min. The EEG recordings of epileptic patient can be differentiated into two types. They are interictal (between seizure) and ictal (during seizure) [3]. EEG signal involves five sub bands; they are delta (0−4 Hz), theta (4−8 Hz), alpha (8−16 Hz), beta (16−32 Hz) as well as gamma (32−64 Hz). These frequency sub-bands can efficiently represent the brain dynamics. Generally, these sub-bands hold more valuable information about the neuronal behaviours and stimulate certain modifications which are not present in the original EEG signal [4].

The problems related to short period EEG recording is that the real events may not be verified. Nowadays, a long-term EEG monitoring is preferred by the physician to determine the seizure and therefore, the patients are asked to stay in a clinic for a long time [5]. But it is not convenient, time-consuming and there is no assurance for the seizure event in the staying period. Therefore, there is a necessity of automatic seizure detection and prediction systems which may be further used to develop newer methods for preventing the seizures. Nowadays, most of the researchers combined different methods to detect seizure by analysing the EEG signals [6 12].

In general, the seizure detection methods consist of four levels of processes: (i) Pre-processing, (ii) conversion of EEG signal into another domain using transforms, (iii) feature extraction and (d) classification [13]. The efficiency of DWT for the extraction of features from EEG signals have been proved in different research studies [14 17]. The classification accuracy can be affected by different parameters like feature vector dimension, and available sample counts for learning, imbalanced class labels, etc. [18]. Therefore, an efficient feature extraction algorithm and feature selection processes are required to improve the classification accuracy. Anyhow, the feature selection process should follow certain procedures like filter and wrapper method for their working [19]. Thus, individual procedures for feature selection and classification lead to design and computational complexity in

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Low Noise and high linearity Wide-band Low Noise Amplifier for 5G Receiver Front End System

M. Ramana Reddy

Abstract*: This work Demonstrates a wideband LNA for 5G receiver front end modules with high linearity, Low noise reused topology has an inter stage wideband inductor based two common source cascade stages. The configuration provides the bias current; better Noise figure increases the forward gain. By providing RC Series network at gate terminal of second stage the return losses are reduced and stability will be increased. After pre and post simulation all parameters are better than the existing LNAS. After post simulation results, the Noise figure is achieved less than 1dB and forward gain as flat 16dB for wide band width of 1.5 – 5.5 GHz. At the 1dB compression point the output is 20dbm achieved and OIP3 IS +40dbm is achieved. The chip size of an LNA along with pad is 0.64mm2. The design is GaAspHEMT process at 50nm technology.

***Keywords*: LNA, OIP3, pHEMT, Noise figure, Forward gain .**

I. INTRODUCTION

Recent years the 5G communications systems are popular because of huge data rate, economical , high reliable small size. Theses all parameters are possible by chosen technology and selected band frequency. The preferable band frequencies for 5G IS SUB- 6 GHz and mw wave frequencies. Usually the mm wave frequencies are suitable for military applications. For 5G systems required many process steps for design and implementation to increase data rate, high reliable .increase the coverage area the transceiver required better sensitivity and more dynamic range.

The most important block in any receiver is LNA. The LNA can play an important role in the entire performance of receiver. The most important parameter in any LNA design and its performance forward gain S_{21}, Input and output matching network Noise Figure, linearity , IIP3 , OIP3 and 1dB compression point . The CMOS technology has drawback of highest Noise Figure, Small gain and less linearity. But low cost and better system integration [1] – [2]. The GA As, pHEMT process of technology of compound semiconductor (III –IV group periodic table components) process has Low Noise, high linearity advantages. This is widely used in in industry as well as academic fields [3]. In order to meet requirements the all existing published work papers authors suggested that different topologies andtechnology processes.

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In reference [4] the authors suggested the current reuse technology with cascaded inter stage resonance is demonstrated for the design of LNA, but designis restricted for 5.2 GHz frequency with minimum substrate resistance. Similarly in gm boosting with current reuse technique is implemented. Similarly in reference [6] a 5.7 GHz differential mode LNA is designed. In this proposedLNA a wideband low noise, high linearity GaAs pHEMT technology with two stage common source transistor cascaded current reused technique with enhanced matchingnetwork at inter stage.

II. PROCEDURE FOR PAPER SUBMISSION

The two stages cascaded common source (cs) current reused topology the bias current is shared in two stages, so that the power consumption is reduced .The different types of current reuse topologies are shown in figure below.

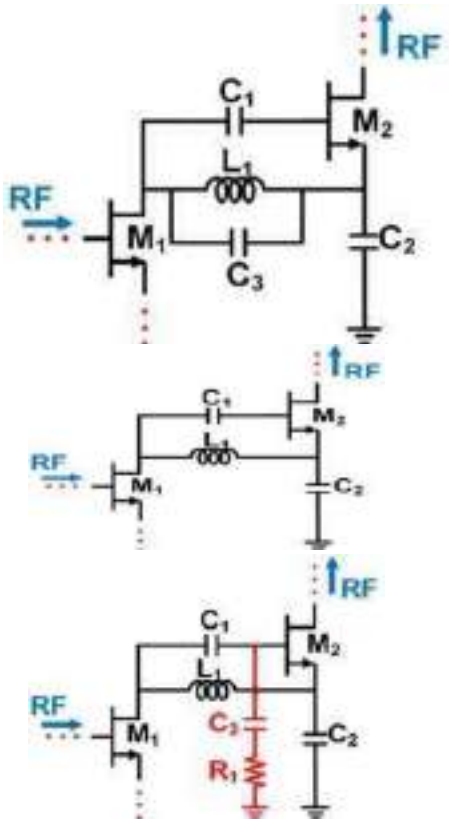

Figure: 1 Different Current reused topologies a) Resistive b) Inductive c) LC Resonant based d) The proposed topology

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DESIGN OF IOT BASED TRANSMISSION LINE FAULT MONITORING SYSTEM

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ABSTRACT

Electrical power is transmitted from the generation plants to end-users at distant locations through the transmission lines. These lines are exposed to various environmental conditions and faults may occur causing power interruption to end-users, damage to the power system. These faults are known to operators only from the end-users when power is interrupted, besides the operators cannot locate the fault immediately and it is exhausting work to locate them. To protect the system from faulty currents or voltages, circuit breakers are used and these are operated by relays. To classify the faults various methods have been developed such as transient analysis using wavelet transform of voltage and current signals, phasor measurement units, artificial neural networks-based approaches, etc. The method of transient analysis is very accurate but involves high computation and the practical implementation is difficult. The purpose of this project is to detect and classify the faults in transmission lines using IoT in addition to the traditional methods. In this project, we are proposing to deploy voltage, current sensors on power lines and collect data from them to detect and classify the faults. This data is then transmitted to the cloud and then an SMS alert is sent to the operator. The project used MATLAB Simulink to simulate generally occurring faults and detecting them by using a technique based on Fuzzy Logic.

Key words: IoT,·MATLAB Simulink, Fuzzy Logic

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1. INTRODUCTION

The transmission line serves as a critical link between the electrical power generation plants and all electricity users. Transmission lines with a length of several kilometres would be affected and service continuity is disturbed as there is a possibility that a fault will occur. Faults should be cleared at regular intervals to ensure stability. Transmission line faults cause equipment damage and instability [1]. As a result, fault protection for the electric power system is needed. Transient faults last for a short period of time, while permanent faults last for a longer period of time. Faults should be identified quickly for immediate isolation of the defective line

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Research Article

Reconfigurable Antennas and its recent developments

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Abstract: In the fast growing research and development, the Radio Frequency front end should be conceptual in a natural scenario; reconfigurable antennas have become crucial, for the upcoming generation of wireless communication. Systems are sensible because of their ability to change the radiation characteristics dynamically. They have many advantages such as good isolation, out of band rejection, multifunctional capabilities, low volume, low front end processing efforts without the need for filtering element which made them useful in wireless communications applications such as fourth-generation (4G) and fifth-generation (5G) mobile terminals. Reconfigurable antennas threw a novel challenge to antenna designers and researchers as they can be tuned to any frequency of operation without changing the radiation pattern. For the past three decades lot of improvement was done in the advancement of reconfigurable antennas. This review paper emphasizes the recent advancements in reconfigurable antennas..

Keywords:

1. Introduction

Wireless communication systems are moving towards multiple functions of wireless services for different applications. These are used at different times and for different purposes like defense, naval, or domestic purposes. The congestion of the electromagnetic spectrum became one of the reasons for enhancement. To take up this challenge, the upcoming wireless communication systems must be cognitive in nature and reconfigurable. The most suitable communication approach is based on the frequency of operation, the direction of the main beam, and different modulation schemes used in the system. To accomplish this, the traditional antennas are replaced by reconfigurable antennas (RA) because of their adaptive nature to different radiation characteristics.

They can also be used as control elements that can be programmed with proper feedback to increase the output, to reduce noise and errors, to avoid obstruction, increase security, less weakening of the signal caused by fading due to multipath, and also to expand the lifetime of the whole system. Some of the examples of promising applications comprise software-defined radio, cognitive radio, multiple-input multiple-output (MIMO) systems, multifunction wireless devices, and phased arrays with very good performance. A clear understanding of the fundamental characteristics like gain, radiation pattern, frequency of operation, and impedance matching will help in designing a good antenna. Reconfiguration can be achieved by re-distributing the currents on the antenna or the electromagnetic fields in the antenna's aperture edges [15, 16, 17, and 18]. The modifications in the operation of the antenna permit its usage in multiple wireless communication applications. Antenna reconfiguration can be done by varying the following parameters like frequency, polarization, and radiation pattern or by combining all of them.

The classification of RAs (shown in Fig.1) mostly depends on the above three parameters and are further divided into four groups such as RF-MEMS, PIN diodes, and Varactor diodes, with optical devices like photoconductive devices, by physically altering the structure and by changing the material like ferrites, liquid crystal, etc.

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Area Efficient Carry Select Adder Using Parallel Prefix Adder Structure

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Abstract

Adders are the basic building blocks of modern digital integrated circuit design and are the necessary part of Digital Signal Processing (DSP) applications. The prerequisite ofthe adder is that, it is primarily fast and secondarily efficient in terms of power consumption and chip area.

A Conventional Carry Select Adder has two Ripple Carry Adder (RCA) which consists of cascaded of "N" single bit full adders. Output carry of previous adder becomes the input carry of next full adder and so on. Therefore, the carry of this adder traverses longest path called worst case delay path through N stages. Now as the value of N increases, delay of adder will also increase in a linear way.

The proposed Carry Select Adder structure which adopts modified parallel prefix adder at the upper part and Binary to Excess-1 convertor at the lower part of a design. This adder is being compared with Conventional CSA and Carry Select Adder using Parallel Prefix Adder in terms of area and performance. The simulations and synthesis of the proposed adder are done using Verilog HDL in XILINX ISE.

1. INTRODUCTION

As the requirement for high performance processor grows, there is a constant need to enhance the performance of data path units. Addition is the most commonly used arithmetic operation and the performance of VLSI processor is enormously impacted by performance of resident adder. A high performance adder with low power consumption designed with minimum area plays an indispensable role in large portion of the hardware circuits. For adding two binary numbers several types of adders have been designed, for example ripple-carry, carry-skip, carry-select adder (CSA) and parallel prefix adders (PPAs). The major speed restriction in the conventional adder circuits, such as ripple carry adder (RCA) and carry save adder arises from the long computation time required for generating the outputs. CSA and carry look-ahead architectures have been suggested to reduce large carry propagation delay of adders.

Ripple Carry Adder consists of cascaded of "N" single bit full adders. Output carry of previous adder becomes the input carry of next full adder and so on. Therefore, the carry of this adder traverses longest path called worst case delay path through N stages. Now as the value of N increases, delay of adder will also increase in a linear way. Therefore, RCA has the lowest speed amongst all the adders because of large propagation delay but it occupies the least area.

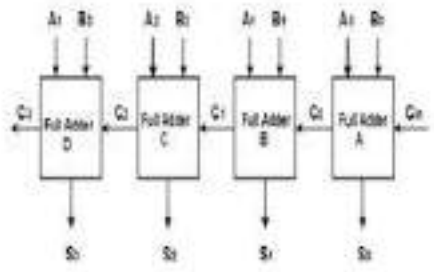

Fig.1.1 Ripple Carry Adder

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Research Article

Medical Image Fusion Based On Feature Extraction And Sparse Representation

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Abstract: -Sparse representation has numerous benefits over traditional picture representation approaches as a novel multiscale geometric analysis technique. The normal sparse representation, on the other hand, ignores inherent structure and time complexity. A new fusion mechanism for multimodal medical images focused on sparse representation and judgment is presented in this article.A map is planned to address both of these issues at the same time. To allow the effects reserve more energy and edge knowledge, three decision maps are designed: structure information map (SM), energy information map (EM), and structure and energy map (SEM). The Laplacian of a Gaussian (LOG) captures the local structure function in SM, and the mean square variance detects the energy and energy distribution feature in EM. To increase the pace of the algorithm, the decision map is applied to the standard sparse representation dependent procedure. By improving the contrast and reserving more structure and energy details from the source pictures, the proposed solution also enhances the accuracy of the fused data. The findings of 36 classes of CT/MR, MR-T1/MR-T2, and CT/PET photos show that the SR and SEM-based approach outperforms five state-of-the-art approaches.

1. Introduction

Thanks to the growing demands of clinic inquiry and disease diagnosis, medical imaging is gaining in popularity. Medical imaging is complicated by a variety of imaging processes.In a small domain, photographs of various modals include a variety of complementary details regarding the human body.For eg, computed tomography (CT) images provide better information on thick tissue, PET images provide better information on blood flow and tumor activity with low spatial resolution, and magnetic resonance (MR) images provide better information on soft tissue. Furthermore, MR-T1 images provide more information regarding anatomical shapes, while MR-T2 images provide a stronger distinction between regular and abnormal tissues. However, a single multiple modalities would not be able to meet the need for high-resolution imagery and simulation for disease diagnosis.Medical picture fusion is a valuable and efficient strategy for combining complementary details from multimodality images to increase diagnostic precision in this regard.Furthermore, fused images are better for assisting doctors in diagnosis and care preparation: fusing MR and CT images will provide images that describe soft tissue and bone while simultaneously representing anatomical and physiological aspects of the human body. To segment white matter lesions and direct neurosurgical resection of epileptogenic lesions, MR-T1 and MR-T2 photos are fused. In oncology, hybrid PET/CT imaging is useful for viewing biological, biochemical, and tumor response characteristics. Furthermore, medical picture fusion not only aids in disease diagnosis but also lowers storage.Multistage decomposition approaches have grown in popularity as the most widely used image fusion process.Discrete wavelet transform (DWT), frame let transform contour let transform and nonsubsampled contour let transform (NSCT) have all been established in recent years. Regrettably,In the presence of noise, transform-based approaches yield low fusion effects, and choosing the decomposition levels is challenging.Since sparse representation (SR) has proved to be an extremely useful method for processing high-dimensional signals more and more researchers are applying it to the field of picture fusion to improve fused outcomes.The regular SR, on the other hand, ignores the intrinsic structure and the time complexity. As a result, incorporating them into the SR model is a rational approach for improving SR but determining the connection between intrinsic structure knowledge and sparse coefficients is difficult. Reference suggested a dictionary learning approach that combined geometrical structure with group sparse coding, but it did not discuss the time complexity of the sparse representation algorithms. Picture fusion approaches focused on joint sparse representation (JSR) and need a significantly higher number of iterations to achieve image vector sparse representation for a larger qualified vocabulary. Some researchers suggested new methods combining multistage transform and SR to fuse the source images' structure details into the fused images, but these methods are far more complicated and time consuming.

As a result, the main challenge became how to achieve picture fusion dependent on SR with local structure knowledge in less time. By extracting the local structure function of the picture blocks, the decision map will assist us in achieving this aim. Unfortunately, the majority of judgment map-based approaches are only suitable for multifocal picture fusion. The decision map is used in infrared and visible picture fusion in references

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Design of High-Speed Low Power Computational Blocks for DSP Processors

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Abstract
In today's deep submicron VLSI (Very Large-Scale Integration) Integrated Circuits, power optimization and speed play a very important role. This importance for low power has initiated the designs where power dissipation is equally important as performance and area. Power reduction and power management are the key challenges in the design of circuits down to 100nm. For power optimization, there are several techniques and extension designs are applied in the literature. In real time Digital Signal Processing applications, multiplication and accumulation are significant operations. The primary performance criteria for these signal processing operations are speed and power consumption. To lower the power consumption, there are techniques like Multi threshold (Multi-Vth), Dula-Vth etc. Among those, a technique known as GDI (Gate diffusion Input) is used which allows reduction in power, delay and area of digital circuits, while maintaining low complexity of logic design. In this paper, various signal processing blocks like parallel-prefix adder, Braun multiplier and a Barrel shifter are designed using GDI (Gate diffusion Input) technique and compared with conventional CMOS (Complementary Metal Oxide Semiconductor) based designs in terms of delay and speed. The designs are simulated using Cadence Virtuoso 45nm technology. The Simulation results shows that GDI based designs consume less power and delay also reduced compared to CMOS based designs.

Key-words: VLSI, CMOS, Gate Diffusion Input (GDI), Braun Multiplier, Parallel-Prefix Adder.

1. Introduction

In most of the VLSI applications, like video and image processing, digital signal processing and microprocessors, various arithmetic computational blocks used are adders and multipliers.

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Image Denoising Using Low Rank Matrix Approximation in Singular Value Decomposition

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Abstract

The factorization of a matrix into lower rank matrices give solutions to a wide range of computer vision and image processing tasks. The inherent patches or the atomic patches can completely describe the whole image. The lower rank matrices are obtained using different tools including Singular Value Decomposition (SVD), which is typically found in minimization problems of nuclear norms. The singular values obtained will generally be a thresholder to realize the nuclear norm minimization. However, soft-thresholding is performed uniformly on all the singular values that lead to a similar importance to all the patches whether it is principal/useful or not. Our observation is that the decision on a patch (to be principal/useful or not) can be taken only when the application of this minimization is taken into consideration. Thus, in this paper, we propose a new method for image denoising by choosing variable weights to different singular values with a deep noise effect. Experimental results illustrate that the proposed weighted scheme performs better than the state-of-the-art methods.

Key-words: Image Denoising, Low Rank Matrix, Nuclear Norm, Singular Value, Soft-thresholding.

1. Introduction

Low rank matrix (LRM) factorization is a crucial method in data analysis and representation. The raw data have a hidden configuration, and by revealing this configuration, an efficient representation of the data is feasible. This is the vital part of LRM factorization. When the original

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Vulnerability Assesment in Web based Applications

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Abstract: ***This Project depicts an in-depth technical approach to perform manual Vulnerability Assessment and infiltration test in web applications for testing the integrity and security of the application and furthermore serves as a manual for test in SANS Top 25 security vulnerabilities. The project is more centered around giving definite information about manual web application penetration testing techniques to get them from malignant black hat hackers. A victim's website can be used for criminal activities, while illegally using the website's bandwidth and making its owner liable for these unlawful acts. While developing the websites, many times developers/site owners forget to remove sensitive data from the website which is not supposed to be exposed to public users. Such data consists of untested vulnerable forms, database backup, and site backup in compressed format. A hacker tries to search for such kind of data and tries to collect important information from it like login detail from that data. So, we will be analyzing all the ways to find such vulnerabilities and also developing the patch to avoid such attacks and prevent them from occurring.***

Keywords: Vulnerability Assessment, Penetration Testing, Hacker, DataBase Back up, Sensitive Data, Patch.

I. INTRODUCTION

Cyber Security refers to the advances, cycles, and practices intended to ensure networks, gadgets, applications, and information from any sort of cyber-attacks. Cybersecurity may likewise be known as data innovation security. It is tied in with shielding devices and organization from unapproved access or adjustment. The Internet isn't just the central wellspring of data; however, it is additionally a medium through which individuals work together. Today, individuals utilize the web to promote and sell items in different structures, speak with their retailers, and perform monetary exchanges. Because of this, programmers and cybercriminals utilize the web as an instrument to spread malware and complete cyber-attacks. Along these lines, the job of Cyber Security assumes a significant part in Hospitality, Defence, Government areas, Private area, they basically assist us with ensuring our information being penetrated and give all necessary organization security. Cybersecurity is a subset of Information Technology It is basically used to ensure both programming and equipment parts. Along these lines, in the coming years, this innovation assumes an essential part. There are a few things identified with Cybersecurity like Physical security, Network security, Application security, Information security, these are to be ensured in the right manner for any fruitful working of any organization. Moral programmers are the systems administration specialists who attempt to infiltrate frameworks and discover weaknesses. Moral programmers follow a few Ethics and follow procedures to clear the Cases. The present coordinated cybercrimes out of sight solitary programmers of the past now enormous coordinated wrongdoing rings work like new businesses and regularly utilize exceptionally prepared engineers who are continually improving on the web attacks. "Cybersecurity alludes to a bunch of strategies used to ensure the uprightness of organizations, projects, and information from attack, harm or unapproved access." From a registering perspective, security contains cybersecurity and actual security, both are utilized by endeavors to secure against unapproved admittance to server farms and other modernized frameworks. Data security, which is intended to keep up the privacy, honesty, and accessibility of information, is a subset of cybersecurity. The utilization of cybersecurity can help forestall cyber-attacks, information breaks, and data fraud and can help in risk the executives.

II. LITERATURE REVIEW

Nowadays, cybersecurity has been a day-by-day issue that can be found anyplace, from the news that reports spam, frauds, scams, and wholesale fraud, to scholarly articles that talk about cyber fighting, cyber surveillance, and cyber defense. eventually, it stays a confounded assignment to move toward cybersecurity as just a basic issue of 'network security or 'individual security' as it associates with a bigger issue of "the state," "society," "the country," and "the economy". A tool purposed named SQLIVDT is designed for efficient SQLI vulnerability detection. The main goal of that tool is to generate test inputs & assess test results. Web application vulnerabilities allow attackers to perform malicious actions from unauthorized ACCOUNT ACCESS. In the last decade, web application vulnerabilities are growing. The black box approach is based on the simulation of SQL attacks against web applications.[1]. Classification of software security approaches used to develop secure software in various phases of software development life cycle.

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Building a Chatbot for the Department of ECE using Flask

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Abstract: ***A Chatbot aims to make a conversation between both human and machine. The machine has been embedded with knowledge to identify the sentences and make a decision as the response to a question. The present technical project consists of developing a system for ECE Department enquiry using web based Chatbot. The ECE Department Chatbot has the capacity to make friendly conversations and gives the link for academic syllabus of different years as well. It also gives the faculty details such as their email address and mobile number.***
Implementation of the ECE Department Chatbot overcomes certain barriers of a website since it correctly understands the user's questions, asks clarifying questions if required and then retrains the system to give the response that the user intends to get. The heart of ChatBot technology lies in NaturalLanguage Processing or NLP.
The project uses Artificial Intelligence Mark-up Language (AIML) which is an XML based mark-up language meant to create artificial intelligence applications. AIML makes it possible to create human interfaceswhile keeping the implementation simple to program, easy to understand and highly maintainable.
Along with AIML it uses Flask, which is a web-framework similar to Django, but is more Pythonic. Implementation is done in Python using some of its software libraries.
Keywords: Artificial Intelligence Mark-up Language, Python, Natural Language Processing, Flask, XML.

I. INTRODUCTION

A computer program designed to simulate conversation with human users, especially over the internet is known as CHATBOT. The manner in which people communicate with businesses has been evolving at a rapid pace. For many years, in- person meetings and phone calls have been the dominant means of communication. Then, with the increase of the net, a large number of latest options became available, from email to social media, to mobile apps, to filling out a form on a website and waiting for a follow-up.Most recently, the increase of real-time messaging has led to a fundamental shift in how people wish to connect with businesses. Commonality in these communication channels, including online chat, is that they have mainly relied on humans to do the communications. But now that chatbots have arrived on the scene, this dynamic is getting down change. Many chatbots depend upon Artificial Intelligence (AI) in order to simulate how humans, communicate. More specifically, intelligent chatbots often rely on machine learning, which is when a program can automatically improve with experience, and also Natural Language Processing (NLP), which is when machine learning is applied to the problem of simulating human- produced text and language.The aim of a chatbot is to perform conversations which allows people to access the information via a light-weight messaging application. There are currently two distinct varieties of chatbot.

Rule-based chatbots:These essentially work as an interactive FAQ. Chatbots are programmed to identify certain terms and patterns from which they will respond with pre-set answers.

AI chatbot: These chatbots operate as an artificial brain, using sophisticated cognitive and natural language processing capabilities. It not only understands requests but also context, intent, emotion and it continuously gets smarter as it learns from conversations it has with users.

Although the primary chatbot, Eliza, was created in 1966 by the Massachusetts Institute of Technology to simulate a psychotherapist, emergence in day-to- day lives has only been in the last two years or so. They are rapidly becoming more worldly, but they are nowhere near to reacheing full potential.Even if the most successful give an illusion of simplicity on the front end, there are plenty of challenges to resolve to offer a seamless customer experience: analytics, flow optimization, error checking, integration to APIs, routing and escalation to live human conversation.

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Self-Interference Cancellation in Full Duplex Communication using Steepest Descent Method

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Abstract: ***The present-day communication system uses Frequency Division Duplex (FDD) to emulate the benefits of Full Duplex Communication. But it requires more bandwidth as the cost of the spectrum is very high it becomes a major limitation. To overcome this problem implementation of Full Duplex Communication is the best solution. Implementation of full duplex communication is difficult because of a significant problem called self-interference. while transmitting and receiving signals on the same frequency band, receiving signal is interfered with the transmitted signal this phenomenon is called self-interference. The objective of this project is to minimize that self-interference signal from the received signal by using signal processing technique, LMS echo cancellation. Least Mean Square (LMS) echo canceller whose coefficients are updated iteratively is used to cancel the self-interference. An algorithm based on steepest descent method is used to obtain coefficients that change iteratively with varying step size to solve Weiner-Hopfs equation.***

Keywords: Self-Interference Cancellation, Steepest Descent Method, Frequency Division Duplex, Full Duplex Communication, Least Means Square algorithm

I. INTRODUCTION

Traditional wireless communication systems contain both radio frequency (RF) transmitter (TX) and receiver (RX). Combination of both transmitter and receiver is known as a transceiver. There exist several traditional methods to successfully transmit and receive data at maximum efficiency. These methods exploit three different areas: time, frequency, and space. TDD architecture will sequentially transmit and receive a signal i.e., the TX and RX will never simultaneously be powered on. Although this method uses a single frequency, the major drawback lies in the fact that twice the time is needed to successfully transmit and receive a data packet of equal size.

Frequency domain method employs Frequency Division Duplexing (FDD). In FDD architecture, the TX and RX will be operating simultaneously but at different frequencies. Both paths will have Band Pass Filters (BPF) tuned to their specific frequency to block out any residual interference that may fall in each respective band. The major drawback of this architecture is that it requires twice the maximum efficient bandwidth. As the number of users and cost of bandwidth are increasing steadily, FDD technology may not be efficient.

A system employing spatial methods will use directional antennas, antenna diversity or cross- Duplex polarization techniques. Multiple Input Multiple Output (MIMO) systems use multiple antennas to increase efficiency by transmitting more packets of data to each antenna. Theoretically, this accommodates for the loss in spectral efficiency of time by effectively doubling throughput; however, maintenance of multiple antennas is required which is a difficult task.

Regarding the requirement of more spectrally efficient systems, it is clear that full duplex systems are a solution. Full duplex systems can exist using two methods – active or passive echo cancellation. Passive cancellation techniques typically rely on the attenuation of the transmitted signal before it reaches the receiver. This purpose can be served by Directional antennas or circulators. In order to achieve Full Duplex Communication and to maximize the echo signal cancellation both active and passive cancellation techniques should be used. Echo cancellation in a transceiver can be performed in three areas. These areas are at RF, analog baseband, and in the digital domain after quantization. It is preferred to perform the cancellation before the ADC otherwise the self-interference signal will saturate the dynamic range of the ADC and prevent the actual signal from being scaled up to the full-scale range. However, there exists a trade-off in this scenario. The cancellation performed in the digital aspect will be less effective if the received self- interference signal is weaker at the input of the ADC. The total cancellation (analog and digital combined) will ultimately end up being equal despite the amount of cancellation that happens in either the digital or baseband analog aspect.

This paper is organized as follows; Section II emphasizes on literature work. Section III describes about in-band full duplex communication, effect of self-interference and cancellation techniques. Section IV provides complete design approach of system. The results are discussed in Section V. This work is concluded in Section VI.

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Real Time Night Vision Surveillance using Improved Dark Channel Prior

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Abstract— Videos taken under low lighting conditions usually result in severe loss of visibility and contrast and are uncomfortable for observation and analysis. Night vision cameras that cater to the needs are expensive and less versatile. To be cost effective and extract maximum information from videos taken in low lit conditions, video enhancing techniques must be used. Though there are many night vision enhancement techniques available in literature, this paper particularly emphasizes about Improved Dark Channel Prior algorithm and its results. This approach suits well for real time night video enhancement. It has been found that a pixel-wise inversion of a night video appears very similar to the video obtained during foggy days. The same idea of haze removal approach is used to boost the visual quality of night videos. An improved dark channel prior model is presented that is integrated with Gaussian Pyramid operators for local smoothing. The experimental results show that the proposed method can boost the perceptual quality of detailing in night videos.

Keywords— Video Enhancement, Gaussian Pyramid, Local Smoothing, Haze Removal, Improved Dark Channel Prior

I. INTRODUCTION

A Dark Channel Prior can be assumed as an envelope which tries to "hide" undesired aberrations that try to degrade the quality of an image or a video. DCP can be utilized in night vision enhancement as a lowly lit video is similar to the inverse of a very hazy video. Hence, parameters like depth of the haze and actual light present during the time of capture play a major role. Proper modelling of these parameters helps in obtaining better results. Typically, Dark Channel Prior is based on the property of "dark pixels". They are pixels that have a very low intensity in at least a colour channel. The DCP-based dehazing techniques are composed of four major parameters: atmospheric light estimation, transmission map estimation, transmission map refinement, and image reconstruction. An in-depth analysis of the DCP is performed in this thesis. Outdoor images have poor visibility under inclement weather due to the absorption and dispersal by atmospheric particles in haze. Poor visibility has a negative impact not only on consumer photography but also on applications of computer vision for outdoor environments such as object detection and video surveillance. Since haze-free images are visually appealing and can greatly enhance the output of computer vision tasks, Haze removal, which is called dehazing, is considered an important process. Under different weather conditions multiple images from the same scene are captured to be used as reference images with clear weather conditions. Such methods, however, have limitations in online image dehazing applications with multiple reference images, and may involve special imaging sensors. That leads the researchers to focus a single reference image on the dehazing process. Single image-based methods are based on the characteristics typical of haze-free images. Hence, DCP and dehazing go hand in hand.

A real-time lowly lit video is very similar to an inverse of a very hazy video. This is the key assumption of this project and dark channel prior algorithm helps achieve it. Hence, every real time lowly lit video is cut up into many frames, enhanced and stitched back together as a video feed. This work models every image using image degradation model.

This paper is organized as follows; Section II emphasizes on literature work. Section III briefly deals with methods such as histogram equalization and contrast stretching that are alluded to in this project's length and throws a limelight at the concept of enhancing night vision. Section IV focuses on the algorithm used and discusses the parameters used in the Improved DCP model. The results and the intermediate changes to the input image are discussed in Section V. This work is concluded in Section VI.

II. LITERATURE REVIEW

Digital video has become an essential part of everyday life. It is well-known that in recent years, video enhancement has gained significant attention as an important subject in computer vision. The goal is to enhance the visual quality of the video or to provide a "better" representation for future automated video processing, such as analysis, identification, segmentation, and recognition [6]. There are numerous applications that acquire, process, and use digital video, such as surveillance, general identity verification, traffic, criminal justice systems, civil or military video processing etc. Carrying out video enhancement understanding under low quality video is a challenging problem because of the following reasons:

A. Due to low contrast, extract moving objects from the dark background becomes difficult. Most colour-based methods will fail on this matter if the colour of the moving objects and that of the background are similar.

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Implementation of Smart Farming using IoT

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ABSTRACT

The paper entitled "Implementation of smart farming using IoT" will be used by farmers for monitoring water supply to the fields and also providing protection for the fields from animals. It uses Thing speak platform to find the soil moisture, find the entry of animals into the fields. The need for this projects to reduce the work of farmers and increase the crop production. In the proposed system the greenhouse parameters like water level and humidity are monitored continuously and data is uploaded continuously to server system using IOT gateways technology. The purpose of Arduino Uno is that it connects all components associated with the development kit. Each I/O pin is associated with a particular component of the kit for performing particular function. The output of the sensors is monitored continuously so that the motor can be switched On/Off. The values of the sensors are continuously uploaded in the server system. As per the system working is concerned the farmer can switch ON the motor by sending a message through his mobile to the arduino by using GSM module. Similarly when animals try to enter the field a warning message is sent to the farmers mobile.

1. Introduction

Many of the farmers are facing a lot of problems while protecting fields during night times. Since protecting the field 24/7 is difficult for farmers. Watering the fields at regular intervals is necessary from increased crop production. Since farmers are very important for the food production it is important to reduce the work of the farmers. Precision Agriculture improves productivity increasing yields and profitability, reducing impact on environment. These days, Internet of Things is playing a crucial role of transforming Traditional Technology from homes to offices One of the main reasons where IoT based research is going on and new products are launching on everyday basis to make the activities smarter and efficient towards better production in"Agriculture".

IoT based agriculture convergence technology creates high value in terms of quality and increased production and also reduces burden on farmers in ample manner. In addition to Agricultural Iot, the future of agriculture is "Precision Agriculture" which is expected which is expected to grow at $3.7 billion by 2020.

With data generated from GPS and Smart Sensors on agricultural field and integratuion of smart farming equipment along with the Big Data analytics, farmers would be able to improve crop yields and make effective use of water and in turn wastage of any sort would be reduced to a remarkable level. The current scenario of agriculture which is surrounded by many problemss, it is utmost requirement to have IoT based Smart Farming. In order to implement smart farming in real world, IoT based products are required to be developed and implemented at regular intervals also at very fast pace.

2. Literature Review

In a paper by Hamnza Benyeza, Mounir Bouchedda, Khaoula Djellout: Smart Irrigation Based on Thingspeak and Arduino explains about the use of ThingSpeak platform to display the values of sensors and tells the importance of using smart irrigation system to increase the crop production. Their system consists of Wi-Fi module to send the

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RESEARCH ARTICLE

Investigation of Doppler Collision Effects in Kinematic Conditions and its Mitigation for NavIC System

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ABSTRACT

NavIC (Navigation with Indian Constellation) constellation consists of four geosynchronous and three geostationary satellites and it is developed by ISRO, India. It provides position, velocity and timing services. Doppler Collision (DC) is a phenomenon where tracking errors are introduced in the measurements due to cross-correlation between the satellites. If relative doppler between satellites is less than the code loop bandwidth, then DC occurs. In this paper, to analyze DC impact on NavIC, the Doppler shift of each GEO satellite is calculated, the most effected GEO satellite pair is identified. In high dynamic applications like missile launches the effect of DC is very significant. In order to investigate DC in high dynamic conditions a simulation of trajectory path of the receiver is considered. For the precise position estimation, the contribution of DC error will be high, so it needs to be minimized. An efficient algorithm is developed to mitigate the DC using narrow correlator design of the receiver. Using the proposed algorithm, the DC duration for 1C-1G satellite pair has been reduced from 50min 21sec to 2sec in static conditions. Whereas in dynamic conditions from 4h20min 28sec to 5sec with DLL bandwidth of 4Hz and 0.1 chip spacing of receiver design.

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Introduction

GPS is the universally used navigation system that covers the whole globe which was developed by the USA. Russia (GLONASS), Europe (Galileo) and China (BeiDou) have also developed their own navigation systems which cover the whole Earth. Countries like India (NavIC) and Japan (QZSS) have developed their own regional navigation systems which cover their country and some regions around. India is developing IRNSS which has an operational name NavIC. The system presently consists of a constellation of seven active satellites [15][17]. As of now nine satellites have been launched as a part of developing the system. The first satellite was launched in 2013 and in the span of 5 years the next 8 satellites were launched. The seven satellites are a mix of both geosynchronous and geostationary. Presently there are 4 geosynchronous and 3 geostationary satellites.

The GEO satellites will have no or very less angle of inclination but the GSO satellites will have higher angle of inclinations [4]. NavIC provides its services to the entire Indian subcontinent and extends up to 1500km around it. NavIC provides two levels of service on two bands of frequency, L5 (1176.45 MHz) and S1 band (2492.08 MHz). It provides both RINEX v3.03 and NMEA data files. The four important functions of the IGS receiver are acquisition, tracking, decoding and position solution. The block diagram og the IGS receiver is shown in Figure 1.

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Research Article

Implementation Of Movement Detection And Tracking Objects From Video Frames Using Image Processing

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Abstract: The moment detection and tracking in a video surveillance system video is a challenging framework. This paper aimed to detect the motion from video frames of compressor JPEG format. The approaches for motion detection using the sum of absolute difference. Once after performing motion detection, tracking the objects is processed for behavioral analysis. A Kalman filter method is applied to predict the position of an object. The video from the stationary camera and static background trajectory movement, and the direction of an object are relatively synchronized. The foreground detection and Kalman filters are used for object detection and motion tracking, respectively.

Keywords: Computer vision, SAD, Kalman filtering, object detection, Video surveillance

1. Introduction

Detection and tracking of an object are significant features in the study of a CCTV surveillance system. It turns the mining of the data from video frames; it can be numerous vision-based applications. The CCTV surveillance system is used for monitoring motion in focus, analyzing traffic. It shows that finding and tracking an object is a significant field study area in computer vision-based surveillance systems.

The current research work in Video Surveillance of numerous dissimilar methods enables different pros and cons. [1-2] developed a two-phased technique that does background recognition via a parametric approach, to optimize the results. Background elimination is applied to decrease the additional computation load. The primary constraint is the fine-tuning of the ghost background. This method is to attain an improved precision rate and to prepare a reliable system.

The research work [3-5] concentrates on one trial and results from another test. Therefore, separating background object assumptions was ended with incompatible—background separation without a ghost in an image area.

Identifying an object motion detection is performed with less computation is ignored in the research. However, it met high performance and accuracy. A multi-camera approach and 3-D modeling [6] are applied.

The research work is based upon the background segmentation of moving objects. Using Gaussian, an average of means and median methods improves accuracy [7]. The above explanation doesn't give way to implement economically. Utmost the techniques prepare their model by applying frames sequence explained in [8,9].

The author's [10] solution is to use one frame to initialize the background. The spatial domain pixels are selected to initialize the model. Then the segment information from the neighboring pixels is considered as temporal on a single frame. But it is unable to recall temporal data.

A single frame can't hold whole data and precise details of the color pattern of brightness from the successive frames. Therefore, the limitation of this method is uneven with noise environment—some more ways to detect ghosts in the first frame, as in [11]. The process that detects the moving objects operates an exclusive color model in the paper [12]. Identify and detect moving objects in a relatively static background and track their entire trajectory using the Kalman filter [13-15].

2. Methodology

To detect the motion and tracking, two primary goals to achieve the operation. Detecting object motion from the video frames is detected and stored.

Tracking is performed on the Stored frames to extract the features of foreground objects, and then the object motion is tracked.

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Research Article

Implementation of Low Cost IoT Based Intruder Detection System by Face Recognition using Machine Learning

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Abstract: The intruder may enter the premises without the owner's knowledge. To identify the motion of a person who tries to enter the house will be detected by motion detection sensor. A PIR sensor placed on the door frame, it triggers the USB Camera to capture the person's image. The captured image is processed to detect face and recognize the image using Machine Learning algorithms and OpenCV. During face recognition, Raspberry pi compares the detected face with the approved pictures kept in the database. Raspberry pi captured 28 images processed per second sends an email to the owner weather authorized or unauthorized. An authentication can be verified by the user via the Internet of Things.
Keywords: Machine Learning Algorithms, face detection, face recognition, OpenCV, Internet of Things.

1. Introduction

A home is a place where we keep our valuables and our wealth. But we can never be sure about these items at times when we are away from our house. The increase in the possibility of potential break-ins by burglars is one of the inevitable problems in the world. Just locking the door may not be secure enough, and there is an urgency to protect our house in our absence. Existing systems for theft detection that have been in practice are expensive, complicated, require more space for recording and frequent user action. IoT security solutions to avoid theft [1], there is a requirement for an intelligent security [2,3] system convenient in use and requires minimum human effort. In this paper, we aim to advance a detection system that detects an intruder using face recognition [4,5] of Haar-cascade classifier.

The "Haar-Cascade algorithm" to identify faces of human beings, which is organized in Open CV by Python language and "Local binary pattern algorithm (LBP)" [6,7] for recognition of faces. Compared with other prevailing algorithms, this classifier produces a high recognition rate even with different expressions, efficient feature selection, and a low collection of false-positive features.

[8,9] Mainly focused on design and developing effective and expedient motion detection, an anti-theft surveillance device. The system captures images as soon as the motion exceeds a specific threshold level. Thus, the reduced data volume is reviewed. Data space is saved without detecting static images, object is considered based on Region of Interest (RoI). This system uses convolution neural networks to detect the motion.

The [10] study revealed that the anti-theft motion detection device protects from moving objects such as human beings and animals. The output is accurate in detecting moving objects with body temperature during day and night times. To determine the performance of an evaluation instrument was framed by the researchers. The device was found to have a good understanding and was acceptable in terms of functionality.

2. Workflow

2.1 Use Case Diagram

The Use case diagrams depict the system flow concerning the user perspective, as shown in Fig. 1. The behavioural chart made from use-case examination. It gives us information about how the user framework. Different steps necessary to be performed by the user in this system are present in the chart. The arrow marks represent the connection of the user to the actions needed to accomplish.

Design and Implementation of Autonomous Vehicle with Lane Tracking and Sign Detection using Machine Learning

G. Mallikharjuna Rao, Akshith Aluguri, Minuka Prajay Reddy, Medidi Ajay Srikar

ABSTRACT

The autonomous vehicle or the driverless vehicle referred to a Self-driving car in simple language. In this project, the primary goal is to develop a prototype of a vehicle that follows a lane and, at the same time, detects, understands, and responds to traffic signs. Image Processing and Machine learning algorithms are applied to detect roads and traffic signs using Raspberry Pi, Arduino, and open-source software. The Canny Edge Detection algorithm is applied to track lanes, and the Haar-Cascade algorithms are used to detect traffic signs. Raspberry Pi collects inputs from a camera module and processes them for lane detection, traffic sign detection, predictions sent to the Arduino for vehicle control.

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A SMART PARKING SYSTEM USING M2M COMMUNICATION

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ABSTRACT

With an increase in the population of the vehicles in metropolitan cities, road congestion is the major problem that is being faced and the time, efforts and fuel are wasted in search of the availability of the free space in a specified parking area. Growth of Internet of Things (IoT) has paved way for integration of mobile devices, wireless communication technologies and mobile applications. To resolves these issues, an IoT based cloud integrated Smart Parking system with mobile application is being proposed. The whole system is based on machine-to-machine(M2M) communication in IoT. The proposed Smart Parking system consists of an on-site deployment of an IoT module that is used to monitor and signalize the state of availability of each single parking space. Pervasive presence of smart phone encourages users to prefer mobile application-based solutions.

Key words: IoT, Parking System, M2M communication, population

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Simulation and Performance Analysis of Interleave Division Multiple Access (IDMA) in Comparision with Code Division Multiple Access (CDMA)

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ABSTRACT

This paper provides a study of Interleave division multiple access (IDMA) system by implementing in MATLAB and comparison with Code division multiple access (CDMA) in terms of performance. By using MATLAB we can analyze data, develop algorithms, create models and applications as it is more familiarised to engineers and scientists. CDMA is a technology used in 4G. This system provides multiple access communication capabilities. In CDMA as the number of users increase, the overall quality of performance decreases. So to overcome the drawbacks in CDMA, a new technology IDMA has been developed with the inheritance and advancement of CDMA. IDMA is a technology that is explored world-wide in 5G Communication system. IDMA is a multiuser scheme where users are separated by unique interleaver sequences.

Keywords: Code division multiple access (CDMA), Interleave division multiple access (IDMA), Bit error rate (BER), Signal to noise ratio (SNR).

1. Introduction

Wireless Communication is a method of transmitting information from one point to other, without using any connection like wires, cables or any physical medium. Generally, in a communication system, information is transmitted from transmitter to receiver that are placed over a limited distance. In our project we will implement IDMA system and CDMA system using MATLAB and then the performance of these systems are compared in terms of Bit Error Rate (BER) and Signal to Noise Ratio (SNR). The objective of our project is implementation of CDMA System and IDMA System using MATLAB. Then analysis of Bit error Rate Performance of IDMA system over AWGN channel. Then Comparing Bit error Rate Performance of both IDMA and CDMA systems over Additive white gaussian noise (AWGN) channel.

2. Introduction to IDMA

In IDMA Interleavers are used to differentiate the signals on entire bandwidth spectrum [1],[2,],[3]. Since different users are using different interleavers it optimizes ISI. Role of the interleaver is to break low weight input sequences, and hence increase the code free Hamming distance or reduce the number of code words with small distances in the code distance spectrum. In interleaving mechanism, At the transmitter end, the input data streams rearranges itself such that consecutive data bits are split among different blocks and is swapped in a known pattern amongst them.

At the receiver end, the interleaved data is arranged back into the original sequence with the help of de-inter leaver. As a result of interleaving, correlated noise introduced in the transmission channel appears to be statistically independent at the receiver and thus allows better error correction. IDMA offers a number of features: Rate/power adaptation, MIMO According to Shannon, typical sequences are generated and superimposed, fast fading, frequency-selective fading, complexity is linear with respect to the number of layers, number of chips/number of users, number of receiver antennas, number of channel taps, and the number of iterations, delivers reliable

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IoT-Enabled Wireless Sensor Networks for Controlled and Safe Routing

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Abstract – In making brilliant organizations, the Internet of Things (IoT) has advanced universally. The point is to give an edge to IoT PCs to use keen organizations and figures. Additionally, on account of an emergency, its application would improve client care, yet additionally, give steadfastness to the business. Edge figuring utilizes scattered IoT framework and end-client vicinity to give quick response and improve administration quality. In the late examination, choosing sensor hubs or watchman hubs has gotten testing. Frequently, to address their novel organization positions, adversaries move starting with one spot then onto the next. Along these lines, we propose the organization uses the balanced two-fish key strategy to recognize and get away from adversaries in the worldwide sensor organization to offer adaptable security using a dependable tuple directing and the following convention. With the Qualifying Weight Function, the sensor hubs are picked and covered up utilizing a confounded symmetric key. By acquiring the capacities of Multipath Optimized Connection State Routing (OLSR) and Ad hoc On-Demand Multipath Distance Vector (AOMDV), a dependable cross breed directing convention is picked for improvement. Contrasted with current steering frameworks, the proposed arrangement result shows an enormous measure of control hubs. Conversely, the steering strategy utilized is strong, making multipath conveyance, including versatile application rivals.

Keywords – IoT; WSN; Authentication Model; Symmetrical key; Multipath Distribution.

1. INTRODUCTION

The Internet of Things (IoT) has recently developed extremely quickly and has become today's most essential technology. Each actual thing is connected to the Internet in an IoT-based climate. It has various utilizations in homegrown robotization, medical care, military, climate, and modern checking sectors [1,2]. Remote Sensor Networks (WSNs) fill in as spines of any IoT framework that utilizes IoT sensor hubs to accumulate data from the observing climate progressively. Wireless sensing and monitoring platform allowed a customized Internet of Things (IoT) to monitor temperature, relative moisture, and light in

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POSSIBLE SOLUTIONS FOR INTERFERENCE COORDINATION IN HETNETS OF LTE-A

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ABSTRACT

In recent advances in cellular communication, the concept of heterogeneous networks has gained significant importance. A heterogeneous network is poised of multiple radio access technologies, architectures, transmission solutions, and base stations of varying transmission power that can interoperate, thus creating a multilayer structure. Management of interferences caused by the macro station to the low power nodes and vice versa is one of the biggest challenges in the deployment of heterogeneous networks. This paper presents a study of the mutual interference between a Macro cell and a Pico cell within LTE-A (Long Term Evolution – Advanced) framework. It is assumed that the Macro cell and the Pico cell share the same frequency channel and only the downlink (DL) performance is studied. In this paper, the possible solutions of enhanced inter-cell interference coordination (eICIC) in terms of throughput and power are analyzed.

Key words: HetNet, intra frequency interference, interference coordination

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1. INTRODUCTION

In 5G networks like LTE/LTE-A, however, inter-cell interference can be controlled through coordination among base stations. This was made possible because now LTE networks have X2 interfaces defined between base stations. By exchanging interference information over these X2 interfaces, base stations now can schedule radio resources in a way that avoids inter-cell interference.

There are several Interference Coordination technologies in LTE and LTE-A:

- LTE: Inter-Cell Interference Coordination (ICIC)
- LTE-A: Enhanced ICIC (eICIC) which is an adjusted version of ICIC for HetNet, and Coordinated Multi-Point (CoMP) which uses Channel Status Information (CSI) reported by UE

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Currently, Video steganography is especially used for the aim of secure digital communication. This is often the art of hiding all the information in between sender and receiver through carrier like graphics, documents, videos and pictures for the aim of getting the stego objects. Video steganography has significant growth thanks to video data transmission over the net. The performance of the algorithms depends on two factors: data embedding efficiency and data embedding payload. within the past years, a high data embedding payload of video steganography using DWT and IDWT technique which used for the aim of communicating the information secretly among sender and receiver. In this paper proposed Video steganography using DWT-BCH method. Within the method, first video is converted into set of image, after each image apply DWT. A secret key by converting it into a binary data, then perform BCH coding. A BCH coded data is embedded into DWT image. After receiving the embedded image, applying reverse operation to extract the initial data. The performance of the proposed method is evaluated using MSE, PSNR parameters.

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Design and Implementation of RFID Controller using Verilog HDL

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Abstract: ***Manual monitoring consumes more time, man power and shows inaccurate results. So, automation is the solution to cover the problems stated. Barcode and RFID are two different forms of automated technology that are used for reading and collecting data. The RFID (Radio Frequency Identification) technology is a well-known wireless application for traceability, logistics and access control. The RFID controller is constructed in to demonstrate access control through the use of low-frequency RFID tags. These tags contain identification number which is read by the reader, sent to a database where it is compared with stored values. It works on the principle that If the tag's identification number is in the system database, it gives access. If the data is not in the system database, it doesn't give access. To implement these various blocks, include RFID transmitter, RFID receiver, Baud clock generator, Database are designed. The RFID Controller is designed using Verilog HDL in Xilinx ISE tool.***

I. INTRODUCTION

RFID stands for Radio Frequency Identification [1]. RFID is a remote sensing and control technology that can be used to identify and track people or objects. Applications of this technology include Industrial, Automotive, Aviation, Defence and in many other applications.

RFID system consists of a Tag and a Reader. The RFID tag contains a memory chip with a unique ID. The RFID tag reader consists of a transceiver, decoder and an antenna to receive data from the Tag. The reader transmits a continuous interrogation electromagnetic signal which is received by a tag when it is within range. Upon receiving and decoding this signal, the tag sends the reader its identification data, which is typically a stream of bits.

Today, transportation has an important role in our society. However, as we notice, the human population is growing bigger along with vehicles are also growing in number. Monitoring today is becoming a big challenge for everyone in securing their own properties.

In many areas that vehicle passes, there are problems encountered when it comes to security. A lot of vehicles that enter and exits in one place to another is one of the realistic circumstances. It has been raised that there is a difficulty in managing the entrance and exits of the vehicles manually.

RFID tags[3] containing 96-bit to 128-bit Electronic Product Codes (EPCs) are attached to products or devices. The tags, which can be battery-powered active tags or battery-less passive tags, can be read automatically by RFID tag readers, which can send the scanned tag information to a host computer system for processing and storage.

II. LITERATURE REVIEW

A. Edward B. Panganiban, Jennifer C. Dela Cruz, "RFID –Based Vehicle Monitoring System", 978-1-5386-0912-5/17 ©2017 IEEE [1]. In this paper author clearly explained about the operation of RFID-based Vehicle monitoring system. It collects, records, maintains, and saves data detected from the vehicles running in road, passing through road gates, monitoring vehicle status, and entering/leaving an area using RFID Tags as well as gathering and sending Tag ID information into a base station.

B. Suresh Chalasani and Rajendra V. Boppana, "Data Architectures for RFID Transactions", IEEE transactions on industrial informatics, Vol. 3, No. 3, August 2007[2]. In this paper the author clearly explained about the data models for storing the data generated by radio frequency identification (RFID) transactions and architectures for processing such data. Different events that produce RFID transactions in the supply chain are presented and data models to store the data generated by these transactions are discussed.

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FPGA based Design and implementation of Triple Error Detection and Correction Algorithm using BCH Codes

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***Abstract*— Data corruption during the transmission and reception of data because of noisy channel medium is the most common problem faced in the digital communication system. Thus, it is hard to get reliable communication. To get error-free communication we need Error correction code. Hamming codes, Convolution Codes, Reed Mueller codes, Turbo codes and BCH codes are some of the Error Correcting Codes.**

BCH stands for Bose, Ray – Chaudhuri, Hocquenghem, BCH codes are powerful class of multiple error correction codes with well-defined mathematical properties. The mathematical properties of BCH codes are defined as the Galois Field or Finite Field Theory. The focus is to design triple error correcting BCH decoder architecture.

Syndrome Generator, Error Counter, Error Corrector, Flip-Flops, Multiplexer collective design makes BCH Decoder. The BCH codes architecture is described using hardware description language called Verilog and synthesized using Xilinx ISE.

***Keywords*— BCH codes, Syndrome Generator, BCH decoder, Error counter, Error corrector**

I. INTRODUCTION

In the Present Digital Communication systems, there is a lot of demand for reliable data transmission. The environmental interference and the physical defects in the medium are the major causes of the data or message corruption in the communication medium, which leads to the insertion of random bits into the original message and alter the original message. To have a consistent communication through a noisy medium that has an unacceptable Bit Error Rate (BER) and low Signal to Noise Ratio (SNR), we need to have Error Correcting Codes (ECC).

There are many types of error correction codes are used in the present digital communication system are based on the type of error expected, the communication medium expected error rate, and weather re-transmission is possible or not. Some of the error correction codes, which are widely used these days, are BCH, Turbo, Reed Solomon, LDPC, and Hamming codes. These codes are diverse from each other in their complexity and implementation. One of the simplest and linear block codes are Hamming codes. They are proficient of correcting only one arbitrary error and therefore are basically not useful unless a simple error control circuit is required.

The best classic error-correcting codes are the Bose, Chaudhuri, and Hocquenghem (BCH) codes that are a generalization of the Hamming codes for multiple-error correction. The BCH codes form a large class of powerful random error-correcting cyclic codes having capable of multiple error correction. BCH codes function over finite fields or Galois fields

Error correction is taken place by accumulating parity bits to the original message bits during transmission of the information or data. The addition of parity bits to original data makes the size of the original message bits longer. Now this longer message bits are called “Codeword”. This codeword is received by the receiver at the destination and could be decoded to retrieve the original message bits. Error-correcting codes are used in most of the digital applications, space and satellite communication, compact disk players, 2-Dimensional Barcodes, and cellular telephone networks.

This paper is organized as follows; Section II emphasizes on literature work. Section III briefly deals with design and architecture of BCH Decoder. Section IV focuses on design of triple error detection and correction (TED-TEC). Simulation and synthesis results of bch decoder are discussed in Section V. This work is concluded in Section VI.

II. LITERATURE REVIEW

Two parallel implementations of Double Error Correcting (DEC) BCH codes have been considered in [1]. The first implementation of a DEC BCH code (DEC BCH) is a standard parallel Implementation. The Second implementation of DEC BCH codes (DEC BCH II) is by removing all sub circuits and gates which solely contribute to the correction of 3-bit errors. The parallel decoding algorithm was developed and implemented using the Synopsis Design Compiler and a 130-nm industrial standard cell library.

Different coding methods detect and correct from single-bit error to multi-bit or burst errors with the corresponding penalty in code rate, bit overhead, area, and power consumption. Hamming code is well known for its single-bit error detection & correction capability. To provide such a capability, it introduces 4 redundancy bits in a 7-bit data item. The redundancy bits will be appended at the end of the data bits. This eliminates the overhead of the redundancy bits at the sender end and their removal at the receiver end after checking for single-bit error and consequent correction. The method proposed in [2] is highly scalable without the

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Keywords: *t f VV , EC TR, v DCH*

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$$\text{j atf oh l EC Inefx } (ROTI) = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(ROT(i)-\overline{ROT})^2} \qquad >$$

wSfrf O Ts tSf nu. bfr oh fpocSs5

OVERVIEW OF REAL-TIME GNSS SPOOFING ATTACKS AND CONSEQUENCES

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Abstract: Positioning, Navigation and Timing (PNT) services provided by Global Navigation Satellite Systems (GNSS) are irreplaceable in various areas. These services now form a necessary component of several applications starting from smartphones to autonomous vehicles. But GNSS spoofing is currently a major threat to PNT services being offered by GNSS. In the recent years, numerous incidents of GNSS spoofing have been reported worldwide. A successfully implemented spoofing attack can cause interruption to communications, financial transactions and trades, cause power outages, mislead aircrafts to crash landing. An overview of various real-time spoofing attacks and the consequences are elucidated in this paper. This work carries significance in view of the need to create general awareness among GNSS user community about spoofing and the consequences.

1. Introduction: Spoofing proves to be an effective method of Electronic Attack. Spoofing refers to the process of deceiving the GNSS receiver to a false position by generating and broadcasting fake GNSS signals. The broadcast fake GNSS signal is at a higher power level than the original signal, thereby forcing the receiver to lock on to the fake signal instead of the original one and miscalculate its own position. Spoofing can be implemented in three ways: Simplistic spoofing, Intermediate spoofing and Sophisticated spoofing [1]. In Simplistic spoofing, GNSS signal is generated and transmitted towards the target receiver. This technique cannot make the signals aligned with the original GNSS signals. Simplistic spoofing was successfully demonstrated by researchers at Argonne National Laboratories in 2002. Intermediate spoofing synchronizes the fake signals with the original GPS signals. Therefore, the fake signals can more-easily be masqueraded as genuine [2]. Lastly, a sophisticated attack uses several intermediate spoofers in coordination to avoid spoofing detection algorithms of the target receiver. Whatever may be the type of spoofing, the consequences of spoofing are severe. Civilian signals such as GPS L1 are more vulnerable to spoofing attacks. The consequences may

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Smart Glove for Blind

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Abstract: ***To assist visually impaired individuals, a study that helps those individuals to walk additional with confidence is planned. The study hypothesizes a sensible walking glove that alerts visually-impaired individuals over obstacles, pits therefore this device might facilitate them in walking with less accident. It outlines a far better guidance tool for the visually impaired. It consists of straightforward walking equipped with sensors to provide data concerning the environment. GPS technology is integrated with a microcontroller which can facilitate their favorite ones to stay an eye on them. during this system, supersonic sensing elements, GPS receiver, buzzer, vibrator, microcontroller, fall detector, NFC communication, and battery are used. This project will be enforced by victimization Arduino UNO. It will be interfaced with higher than mentioned sensors. The ultrasonic sensing element helps distinguish obstacles and guide the impaired in their manner. If an ultrasonic detector finds any inconvenience in their manner, then Buzzer/Vibrator is employed to send the acknowledgment to the person. All of the unexpected, if the person met with an associate accident or any excess factor happen then fall detector senses that and it'll send the acknowledgment to their guardian. additionally, to all or any of these options, NFC will be used as a backup choice. the device aims to supply a convenient and safe technique for the blind to beat their difficulties in lifestyle.***
Keywords: GPS, GSM, NFC Communication, Arduino UNO, supersonic sensing element.

I. INTRODUCTION

Vision is that the most significant part of human physiology as eighty-three of knowledge a person gets from the atmosphere is via sight. The 2011 statistics by the World Health Organization (WHO) estimates that there are 285 million people within the world with visual defects, thirty-nine million of that are blind, and the remaining 246 million with low vision. Presently, blind folks use a white stick as a tool for guiding them after they move or walk. Here, we tend to develop a tool that might function as a sensible glove being additional economical and useful than the traditional one. this may assist the blind persons throughout the walk associated provides an alarm if any hurdle is detected among the set range. Nowadays, technology and human life can't be separated because it has become the development of the globe. however, the technology will facilitate people that visually impaired? Blind individuals sometimes will estimate the obstacle ahead of them while not knowing the particular distance of the obstacle from them. quality for the blind folks will be outlined as quality to maneuver with safety and ease through the atmosphere while not suppose different. most ordinarily quality aid utilized by the blind cane and guide dogs to facilitate their movement. However, there are issues with these navigation supports. they will give a restricted preview for the user and as a result, a user needs to be additional careful to run and mobile very slowly. As for the guide dogs, coaching and coordinating the dogs with blind folks are tough tasks and also the result is minimal. To beat this drawback, analysis on the assistant devices for the blind has been done by {many people to assist cut back the restricted ability of blind people. The helpful glove for the blind could be a device that will facilitate the visually impaired to facilitate movement and to perform daily activities while not relying an excessive amount on others. The glove with the combination of ultrasonic sensor HC-SR04, Arduino UNO microcontroller can help blind to facilitate movement and provides alert to the user if there are obstacle ahead of them within the range of a pair of cm to three hundred cm.

II. LITERATURE REVIEW

To make the System additional economical there is a varied system that relates to the event for projects associated with blind persons. This literature survey facilitates us to beat various style and program-related enhancements. In "Voice-based email system for blinds" by T. Shabana1, A. Anam, A. Rafiya, K. Aisha. says "In today's world communication has become very easy thanks to the integration of communication technologies with the web.[2] but, the unsighted due to notice it because of tough to utilize this technology owing to the very fact that victimization they need visual perception". even if several new advancements are enforced to assist them to use the computers with efficiency no unexperienced user World Health Organization is visually challenged can use this technology as with efficiency as the unexperienced user will do this is not like normal users, they need some practice for using the obtainable technologies.

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Plant Monitoring System using Image Processing

E.Chandrasekhar[1], P.Chandra Sekhar[2]

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KEYWORDS e onnHbFmT mHkmGHkz) hdkbnmG)

I. INTRODUCTION

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II. PLANT MONITORING SYSTEM

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Vehicle Health Monitoring System

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Abstract: Now-a-days, rented cars are being widely used by people and the business growth pertaining to this sector has been tremendously increasing in recent years. However, the cars have been the primary requirement for running the firm; it is absolutely required to keep track of these valuable assets. The monitoring of cars is very much important as the firm holds large number of cars and the tracking of each car's health being used by the customers simultaneously is the primary concern. These challenges can be tackled with the help of On-board diagnostics. On-board diagnostics is an automotive term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle owner or repair technician access to the status of the various vehicle subsystems .The amount of diagnostic information available via OBD has varied widely since its introduction in the early 1980s versions of on-board vehicle computers. Early versions of OBD would simply illuminate a malfunction indicator light or "idiot light" if a problem was detected but would not provide any information as to the nature of the problem. Modern OBD implementations use a standardized digital communications port to provide real-time data in addition to a standardized series of diagnostic trouble codes, which allow one to rapidly identify and remedy malfunctions within the vehicle. A car generally is equipped with OBD-I or OBD-II bus to specify the reports or diagnostics of the vehicle.

Keywords: *On-board diagnostics, self-diagnostic, idiot light, real-time data, diagnostic trouble codes, malfunctions.*

I. INTRODUCTION

The total car sales raised to 2.6 million units in India alone by the year 2009.With the increase in number of cars along with other modes of transport such as public transport system, vehicles for supply chains and two wheelers on road, the issues like safety, fuel consumption, pollution check are of utmost importance which depends on vehicle condition, road infrastructure and driver behavior [1].

The paper aims at developing an embedded system for detecting the vehicle condition by monitoring the internal parameters that are used in evaluating the vehicle‘s current health condition. These parameters are obtained using OBD2 protocol through a port provided by the manufacturers to the vehicles.

A real time evaluation system is being defined that can be used for rapid condition screening and provide reliable information about the vehicle conditions. This real time evaluation system can be called Vehicle Health Monitoring System. The information that is obtained about the vehicle conditions can be accessed using a scan tool known as the OBD adapter by inserting the adapter into the OBD port provided inside the car.

OBD stands for “On-Board Diagnostics”. It is a computer-based system originally designed to reduce emissions by monitoring the performance of major engine components [3]. The system model being developed is a standalone on-board model which will be a black box for outside world. This model can be extended to identify and report the faults in car to the authorized service centre through wireless communication and IoT, a concept of remote diagnostics.

A. HARDWARE SPECIFICATIONS

1) ***Atmel AT89S52 microcontroller:*** The AT89S52 microcontroller is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications. The AT89S52 provides the following standard features:

- 8K bytes of Flash
- 256 bytes of RAM
- 32 I/O lines
- Watchdog timer
- Two data pointers
- Three 16-bit timer/counters
- Six-vector two-level interrupt architecture
- Full duplex serial port
- On-chip oscillator
- Clock circuitry

2) ***Wi-Fi module – ESP 8266:*** The ESP 8266 Wi-Fi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP 8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP 8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your adapter device

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A SHARED APERTURE MULTIFUNCTION DUAL POLARIZED DUAL BAND ANTENNA FOR BASE STATION APPLICATIONS

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ABSTRACT

This paper presents a novel arrangement of dual polarized dual band antenna in shared aperture concept. It consists of multifunction feature for base station applications in a single radome with low profile and compact size. In this work two varieties of antennas working in separate bands are integrated in a single aperture, an aperture coupled patch antenna for covering low frequency band operation and for High frequency band a printed broadband cross dipole antenna were used. Both antennas shares the common aperture and making it suitable for multifunction application with orthogonal linear (+45/-45) slant polarization which is used for polarization diversity in the base station antennas. The Low band antenna covers GSM frequency band working over 0.698–0.960GHz and the second antenna operates in the band of 1.710–2.69 GHz frequency band, which is serving for 2G-3G-4G applications. The Returns loss (S_{11} = -10 dB) bandwidth of aperture coupled antenna is 31.6% (0.698–0.960 GHz) and printed broadband cross dipole antenna has 44.5% (1.710–2.690 GHz). The measured S-parameters and pattern results are well matched with the simulation results.

Key words: dual band antenna, GSM, 2G, 3G, 4G, bandwidth.

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Performance Analysis of Median and Wiener Filters in Image Denoising

Dr. Panyam Narahari Sastry

ABSTRACT

Images are likely to be degraded by the sensing environment when acquired through optical, electro optical or electronic means. The degradation may be in the form of sensor noise, blur due to camera misfocus, relative object-camera motion, random atmospheric turbulence, etc. For digitally acquired pictures, noise can be summarized as the visible effects of an electronic error in the final image. Noise is a function of how well the image sensor and digital signal processing systems inside a digital camera are prone to and can cope with or remove these errors. Noise significantly degrades the image quality and increases the difficulty in discriminating fine details in the image. It also complicates further image understanding and low-level computer vision processing, such as image segmentation and edge detection. This work aims to understand the performance of various filters on different noises. The image under test was subjected to Gaussian noise, salt & pepper noise and Speckle noise to two input image samples. They were further analysed with respect to the performance of Median filter, Wiener filter and Order statistic filter in denoising the images. The experiments proved and concluded that Median filter is capable of removing salt & pepper noise in images to a greater extent, while other filters used in this work could not remove the same. In this work the parameter SNR (signal to noise ratio) was used to decide the effectiveness of filter. The SNR value for the salt and pepper noise after applying the median filter gave as high as 23, which proves the fact that median filter is most suitable to remove the salt and pepper noise.

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Research Article

Analysis and Identification of Aeroplane Images Using Transform Based Methods

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Abstract: Object recognition is one of oldest applications of automatic pattern recognition. The object recognition has generated lot of interest among researchers for a variety of applications like face detection, people counting, vehicle detection, manufacturing industry, online images, security etc. The main objective of this work is to recognize aeroplanes, even if they are of different size (different scale) or even if they are Oriented with different skew angles. This work would be useful in tracking an aircraft for navigation applications. Further the identification of aeroplanes can be used in military applications to detect the enemy aircrafts.

To achieve these objectives, the main challenge is the different shape, size and orientation of aircrafts which pose difficulty in the object recognition. In this work, an aeroplane is identified by extracting and comparing features between the test and training database images. This task is difficult for computers, however for humans; object recognition is effortless and instantaneous. In the first stage, the images of different aeroplanes and helicopters are selected and these images are downloaded from the web page "www.grabcad.com". These images are grouped into two sets. The first set comprises database images which are used for training the system, whereas the second set is used for testing and obtaining the recognition accuracy for different algorithms. All these images are normalized and binarized using the thresholding concept.

In the second stage, 2D- Transforms (2D-FFT and 2D-Hough Transform) are applied to all the pixels of these binarised images (both testing and training database). After applying the transform, the pixel intensity value will have both, the real and also the imaginary values. Since the imaginary values of the pixel, has only "phase information", which is not useful in the recognition of aeroplanes, this imaginary value of all the pixels in all the images are neglected.

The real part of the pixel intensity values (after applying the transform) is only considered for recognition. In this work, all the images are normalized to 50 X 50 size and hence the total number of pixels becomes 2500 for every image. The size of the matrix of each image (both test and database) is converted to (2500 X 1) column matrix from 50 X 50 matrix size. Hence after applying 2D transforms each image is of matrix size (2500 X 1). This matrix of (2500 X 1) size for each image (both testing and training), becomes the feature vector for that particular image. This process is applied to all the images and the features are extracted for all the test and database images.

In the third and the last stage, k-NN (k Nearest Neighbourhood) classifier is used in the identification of an aeroplane. The k-NN classifier with k=1 is the Euclidean distance. Hence, the recognition is achieved by calculating and identifying a database image which has minimum Euclidean distance to the given test image. The test image is shown on the left side of the result image, whereas the identified image of the database is shown on the right side of the result image. The cross validation of the results is also performed in this work. The Recognition accuracy with 2D-FFT is obtained as 88% and the Recognition accuracy with 2D-Hough transform is found to be 82%.

The reason for this difference can be because of the reason that, Hough transforms works on the principle of detection of straight lines in any image. Hence it can be concluded that 2D-FFT has higher Recognition accuracy compared to 2D-Hough transform.

Keywords: k-NN (k Nearest Neighbourhood), 2D- Transforms (2D-FFT and 2D-Hough Transform), phase information.

1. Introduction

In this chapter, the methodology adopted of the proposed method is discussed using block diagram. The block diagram for recognition of aeroplane is discussed in detail and the various operations on the images are also elaborated. The procedure for cross validation of results is also discussed in detail. The key objective is to develop Object recognition techniques which are efficient and less complex. The primary step is to collect the images of aeroplane and divide them into test images and training images. In this project there are 200 training images and 50 test images. In the 50 test images, there 35 aeroplane images and 15 helicopter images. The images are color images and are of different sizes, all the images are stored in JPEG format.

In the pre-processing stage, all the images are selected, cropped, binarized and finally they are normalized to a size of 50 X 50. The color images are conveted to binary images by using Photoshop tool by minimum rectangle

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Research Article

Analysis and Recognition of Animals in Zoo Using Transform based techniques

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Abstract: An object recognition system identifies an object which is under test by comparing different features of the test and training database images. This task is difficult for computers, however for human's object recognition is effortless and instantaneous. The various applications for object recognition are in the fields of Medicine, Communications, Military Intelligence, Bioinformatics and many others. It is the ability to perceive an object's physical properties such as shape, colour and texture and apply semantic attributes to the object, which includes the understanding of its use, previous experience with the object and how it relates to others. Algorithmic description of this task for implementation on machines has been very difficult. Humans recognize a multitude of objects in images with little effort, despite the fact that the image of the objects may vary somewhat in different viewpoints, in many different sizes and scales or even when they are translated or rotated. Many approaches to this task have been implemented over decades, but still, this is an open area of research. There are standard databases available for research in the area of object recognition. In this proposed work, the images of the different animals are downloaded from https://www.rocq.inria.fr/gamma/gamma/download/ANIMALS/index0.php and 3D Meshes Research Database. These images are to be converted into binary form, by using thresholding method. In the next step, distinguishable features which may be Zone based, Transform based or Statistical in nature are to be extracted from these images. Using these features, animals (in the present work) can be recognized by using various classifiers such as SVM, Neural Networks and NNC (Nearest Neighbourhood Classifier) namely 'Euclidean Distance'. The execution time of the simulation would also be compared for all the transforms implemented in the work. The results obtained would be compared with the existing results of similar work

Keywords: Nearest Neighbourhood Classifier, Euclidean Distance, Military Intelligence

1. Introduction

An object recognition system finds objects in the real world from an image of the world, using object models which are known to the system earlier. This task is surprisingly difficult. Humans perform object recognition effortlessly and instantaneously. It is the ability to perceive an object's physical properties (such as shape and colour) and apply semantic attributes to the object, which includes the understanding of its use, previous experience with the object and how it relates to others. Algorithmic description of this task for implementation on machines has been very difficult. Humans recognize a multitude of objects in images with little effort, despite the fact that the image of the objects may vary somewhat in different viewpoints, in many different sizes and scales or even when they are translated or rotated. Objects can even be recognized when they are partially obstructed from view. This task is still a challenge for computer vision systems. Many approaches to the task have been implemented over multiple decades.

Object recognition is concerned with determining the identity of an object being observed in the image from a set of known labels. It is assumed that the object being observed has been detected or there is a single object in the image.

2. Methodology and Block Diagram

2.1 Introduction

In this chapter, the methodology adopted for the proposed method is discussed. The step by step algorithm is discussed in detail and the various operations on the images are also elaborated.

2.2 Block Diagram for Recognition of Animals

The image pertaining to animals from a standard database are downloaded. The downloaded colour images of the animals are of the size 600*600 pixels. There are totally 600*600=36000 pixels in each image of the animal. After the colour image is converted into grayscale image using MATLAB, the intensity values of different pixels range from 0 to 255. These images are binarized using thresholding concept with various values ranging as 0.50,

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A Crystal view on Brain Tumor Detection Methods

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Abstract

The abnormal tissue development within the brain that prevents its activity is conceived as a brain tumor. The exact identification of brain tumors is a significant diagnostic trait. In this document, the advantages and disadvantages of newly arrived brain tumor diagnostic approaches are explored. A standardized flow chart is proposed that is commonly suitable for the assessment of brain tumors. Numerous beneficial databases are mentioned, which are widely accessible for brain tumor algorithms. Recent literature arrivals are contrasted with their performance in terms of precision, sensitivity, unique design, and time usage. Guidelines are finally rendered with reasonable effort to classify brain tumors according to existing study criteria with good quality.

Keywords: Brain Tumor Detection, brain tumor databases, Magnetic Resonance Imaging, Medical Imaging.

1. Introduction

Various general societal lifestyles strongly impacted the broad number of diseases in the contemporary human community. Per year, the human population has to contend with numerous diseases. Any pathogens die without leaving much signs, and others do more harm to healthy. It is the illness inside their midst that takes the life of a person. It seems to be found in the brain cells, which seems to influence the human's overall level of activity[1], [2]. This condition is also followed by other signs, including more severe headaches, feeling tipsy, exhaustion, etc. The MRI scans show the nature of the disease, but the disease's presence has not been established [3], [4]. An analysis of the brain picture collected from various instruments, such as CT and MRI machines depicted in figure1.

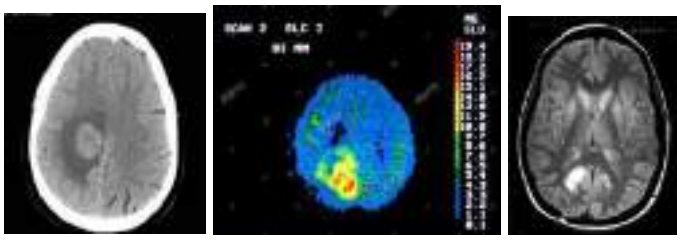

Figure 1. From Left to Right, CT, PET, MRI images with a brain tumor

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Performance Analysis of ZF-SIC and MMSE Equalizers for MIMO System in the Presence of Alpha(α)-MU(μ) Fading Channel

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Abstract: ***Fifth generation cellular networks are the key systems which are being deployed in the near future. The enabling technology, Multiple-In Multiple-Out (MIMO) wireless technology makes use of varied number of antennas at the transmitter and multiple antennas at the receiver for transmission of the information in cellular communication systems. This MIMO technology acts as a foundation and aims to improve the spectral efficiency and throughput in fifth generation wireless communication systems. The most common parameters we come across in wireless communications are Bit error rate (BER), Inter Symbol Interference (ISI), Signal to Noise ratio (SNR), Signal to Interference plus Noise ratio (SINR), Successive interference cancellation (SIC), etc. The primary objective of this paper is to improve the BER performance by minimizing SIC using Zero Forcing– Successive Interference Cancellation (ZF-SIC) with optimal ordering and suppress the noise enhancement prevailing in the channel by an extended detection technique, Minimum Mean Square Error (MMSE). As a purpose to improve the channel capacity, MIMO systems are utilized for transmission purpose lately. Quadrature Phase Shift Keying (QPSK) modulation technique is utilized in the system model, which makes use of the same channel bandwidth and carries twice the information and alongside Binary Phase Shift Modulation Technique (BPSK) is also made use of in the system model to provide a comparative analysis among the detection techniques and modulation techniques discussed previously. MIMO fading distribution such as alpha(α)- mu (μ) fading channel distribution is taken into consideration to generate a channel model.***
The simulated results are analysed and compared with respect to their BER performance taking into account diverse values of alpha(α), mu(μ) parameters. The significance of this paper is to provide a channel efficient, minimized successive interference cancellation at the receiver end in order to make the system more reliable, less complex, interference negligent and simultaneously improve the BER performance. In the near future, these MIMO techniques form a foundation to produce more reliable systems with high terahertz bandwidth. This indeed will open to more seamless communication in various fields of technology.
Keywords: MIMO, ZF-SIC, MMSE, BER, ISI, α – μ fading.

I. INTRODUCTION

In 2020, the fifth generation (5G) wireless communication is the next big advancement of the wireless technology domain in the world of global connectivity engineered to greatly improve the responsiveness and speed of the communication network. Communications with numerous antennas appear to arrive as the latest development for high-speed wireless communications, as one of the most novel technologies to deliver improved performance [1,2]. The enabling technology which yields to the growth in wireless communication networks is the Multiple input multiple output (MIMO) technology. In the previous literature there exist many detection techniques which have been adapted to study BER performance of the MIMO system. A successive Interference Cancellation Zero-Forcing Equalizer (SIC-ZFE) was proposed to provide Inter symbol Interference (ISI) free communications over the ISI MIMO channels which do not require a long guard period. A flat fading Rayleigh multipath channel was assumed [3]. To reduce the computational complexity, a successive interference cancellation process was proposed in SIC-ZFE, instead of legacy method of element by-element interference cancellation mechanism. The methods under study were Maximum Likelihood detector, Zero Forcing (ZF) and the ZF-SIC equalizers in the presence of a classical fading channel distribution. It was noticed that the computational complexity of Maximum likelihood detector increases as the number of antennas increases for a given MIMO system [4]. The drawbacks of the ZF equalizer were observed, as a result an enhanced detector, MMSE Minimum mean square error equalizer acts as tradeoff between interference cancellation and noise reduction in the channel. A MMSE estimator was proposed to minimize the mean square error between actual signal and the detected signal [5,6].

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Design of GaAs Based LNA at 26 GHz Band

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***Abstract*—Amplification is the most important functionality in modern Communication Radio receivers. The Low Noise Amplifier (LNA) is the chief design in the receiver architectures. In order to amplify the signal received from the antenna in a RF system, LNA is required. A low noise amplifier operated in 26 GHz band with maximum gain of 27.861 dB and minimum noise figure of 1.467 dB has been designed using GaAs p-HEMT technology. The design uses inductive source degeneration topology along with resistive shunt feedback amplifier to get appropriate trade-off between gain and noise figure. Advanced Design System (ADS) software has been used for observing the simulation results.**

***Index terms*— Low noise amplifier, mm-Wave, GaAs, p-HEMT, Advanced Design System.**

I. Introduction

The Low Noise Amplifier (LNA) is the main block and also the first level of RF receiver which is often used in wireless communication. It is often used for the amplification of weak signals received at receiver antenna. LNA consists meagre amount of internal noise, so it doesn't give much of its share to system noise [1]-[2]. As LNA is the main section of RF front end receiver, specifications like low noise figure (NF) and high gain should be taken into consideration while designing LNA to maintain overall receiver NF low. There are many applications of LNA in the field of communication such as in wireless communications, astronomy applications, radar and satellite communications, telecommunication etc. Gain, Noise Figure, input return loss and output return loss are the basic specifications of LNA. For the representation of these specifications S-Parameters of an amplifier are used. Along with these features some of other features to be considered while designing LNA are linearity, stability, bandwidth and power dissipation.

Until now, many LNAs are designed for various applications in 3G, 4G frequency spectrum but now, with the advances in wireless technology, LNAs designed in 4G frequency spectrum almost reached its limits and only very few further improvements can be made to LNA. Today, the desired data rates and expected communication quality are increasing exponentially. In the near future, LNAs designed in 4G frequency spectrum will not meet these requirements. To overcome this 5G mm-Wave spectrum is proposed. According to FCC, in 5G mm-Wave spectrum (24 GHz to 300 GHz), the frequency bands 26 GHz and 28 GHz can be made available for the service immediately [3] in India. So, we have chosen 26 GHz band (24.25-27.5) GHz among those available bands to design LNA to meet the requirements.

Engineers are developing different circuits and improving the existing topologies so that devices can operate in 5G frequency spectrum. After comparing the performance of LNA in 26 GHz band among different technologies like CMOS, SiGe, InP, GaAs p-HEMT, GaAs m-HEMT, GaN and etc., GaAs p-HEMT exhibits better performance [4]-[10], [29]. Recent improvements in GaAs high electron mobile density enables GaAs p-HEMT to operate devices with good performance in high frequencies. In high-frequency circuit, it is highly efficient, compared to silicon semiconductor because of its faster operation speed and low heat generation. Since these advantages are in the high-frequency region, GaAs-based devices are mostly preferred for high frequencies [11]-[23], especially in the design of LNA.

We studied and analyzed various topologies: Common source amplifier, common gate amplifier, Inductive Source Degenerated Amplifier [25]-[26] and Resistive Shunt Feedback Amplifier [27]-[28]. Among those topologies Resistive Shunt Feedback Amplifier and Inductive Source Degenerated Amplifier topologies shows appropriate tradeoff between gain and noise figure [24]-[28].

This paper comprises of IV parts in which section II briefs about the process of designing LNA, Section III displays the results of simulation and discussions. In the end, section IV gives conclusion.

II. Design of Lna

In this work LNA is designed to operate in 26 GHz band. The low noise amplifier has been designed and simulated using Advanced Design System (ADS) simulation software. ADS tool has many libraries. In this work, the active device used is from S – parameter library. The design uses S-parameter simulation controller to for obtain the device stability and other parameters. And to observe linearity harmonic balance simulation has been used.

In this work GaAs p-HEMT technology is used to achieve low noise figure. The main component of this amplifier is ATF-36077. It is an ultra-low-noise Pseudomorphic High Electron Mobility Transistor (p-HEMT). The main idea behind selecting ATF-36077 device in this work is due to its very low noise resistance as it decreases the sensitivity of noise performance due to variations in input impedance match by which the designing of Low Noise Amplifier will be much easier.

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Maximal Ratio Combining Based Rake Receiver for UWB Communications

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ABSTRACT - An alternative method to channel estimation is presented as a means of supplying a RAKE receiver with the coefficients for Maximal Ratio Combining (MRC). The proposed RAKE receiver utilizes Time Hopping Pulse Position Modulation (TH-PPM), and is specifically designed to be used in Ultra Wideband (UWB) communication systems in which channel estimation becomes problematic because of the high sampling rate required. The MRC coefficients are determined by a simple process of averaging the received energy for given correlator finger over the course of a pilot sequence of *P* pulses. Performance of the proposed RAKE receiver is investigated through simulation using a discrete-time implementation of the multi-path channel model published by the IEEE 802.15.3 task group. The proposed RAKE receiver's Bit-Error-Rate (BER) performance is compared against other RAKE receivers relying on channel estimation.

I. INTRODUCTION

With the recent Federal Communications Commission (FCC) Ultra Wideband (UWB) emissions mask released in 2002 [1], there has been a surge interest in UWB technologies. Traditional UWB technology relies on sub nano second pulses that have a corresponding signal bandwidth greater than 500 MHz [2]. Referred to as Impulse Radio, IR-UWB technology offers the possibility of developing high data-rate, low power-consumption communication systems that provide greater immunity to multi-path fading due to the pulse's fine delay resolution [3], and greater Bit-Error Rate (BER) performance at a given Signal-to-Noise Ratio (SNR) due to the signal's spreading in spectrum [4]. Pulse Position Modulation (PPM) and Pulse Amplitude Modulation (PAM) are the two modulation schemes generally used in IR-UWB, and are often used in conjunction with a pseudorandom (PN) code implemented either by performing time dithering on the pulses (TH-UWB) or though a Direct-Sequence Spread Spectrum (DS-SS) approach [2]. In this paper, a THUWB scheme is assumed, but the results would still apply to IR-UWB systems in general.

Within a multi-path environment the transmitted UWB pulse appears at the receiver as a collection of attenuated and delayed replicas of the original pulse, assuming the frequency selectivity of the channel is ignored. A RAKE receiver, made up of a set of *N* correlators, each delayed in time to correspond to a given multi-path component or pulse replica, is usually employed in multi-path channels because it allows a greater percentage of the signal energy to be collected for the purpose of symbol estimation [5]. A number of different methods have been proposed for combining the output of the correlators in RAKE receivers, but for single-user systems, it has been found that Maximal Ratio Combining (MRC) results in the best performance [2]. The MRC coefficients correspond to the relative amplitudes of the pulse replicas received by each correlator finger, such that more emphasis is placed on stronger multi-path components and less on weaker ones when the output of the correlators is summed for the symbol decision.

In a typical RAKE Receiver, the MRC coefficients are provided by performing channel estimation. Numerous approaches to channel estimation in UWB communication systems have been suggested, but there are significant drawbacks associated with the implementation of each of them. A maximum-likelihood (ML) approach would provide optimal performance,

and could be used for both data-aidedestimation, in which a pilot sequence of *N* symbols known *a prior* is transmitted and received, and also for nondata-aided estimation in which no pilot sequence is present [6].

However, the complexity and required sampling rate required to implement such an approach in a physical device is prohibitive [7]. Other suboptimal estimation approaches include the sliding window (SW) and successive cancellation (SC) algorithms used in Direct-Sequence Code Division Multiple Access (DS-CDMA) systems [7], as well as a least-squares method that assumes equally delayed multi-path components [8]. While these channel estimation approaches require less computation, they still require sampling at unrealistically high rates. Simulations for the SW and SC algorithm approaches and the least squares method used sampling frequencies of 20 GHz and 10 GHz, respectively [7]-[8].

Current CMOS technology is simply not capable of producing the high frequency clocked comparators needed to construct the required ADC, and even given the existence of such high frequency ADCs, the hundreds of milliwatts of power they would consume would run counter to the low power design criteria set by most UWB communication system designers [9]. Schemes do existing for relaxing the demands upon the ADC. The given pilot signal used for channel estimation could be sent multiple times, and given that the ADC were

2. An Attribute-Based Controlled Collaborative Access Control Scheme For Public Cloud Storage

An Attribute-Based Controlled Collaborative Access Control Scheme for Public Cloud Storage

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***Abstract*— In public cloud storage services, data are outsourced to semi-trusted cloud servers which are outside of data owners' trusted domain. To prevent untrustworthy service providers from accessing data owners' sensitive data, outsourced data are often encrypted. In this scenario, conducting access control over these data becomes a challenging issue. Attribute-based encryption (ABE) has been proved to be a powerful cryptographic tool to express access policies over attributes, which can provide a fine-grained, flexible, and secure access control over outsourced data. However, the existing ABE-based access control schemes do not support users to gain access permission by collaboration. In this paper, we explore a special attribute-based access control scenario where multiple users having different attribute sets can collaborate to gain access permission if the data owner allows their collaboration in the access policy. Meanwhile, the collaboration that is not designated in the access policy should be regarded as a collusion and the access request will be denied. We propose an attribute-based controlled collaborative access control scheme through designating translation nodes in the access structure. Security analysis shows that our proposed scheme can guarantee data confidentiality and has many other critical security properties. Extensive performance analysis shows that our proposed scheme is efficient in terms of storage and computation overhead.**

***Index Terms*— Public cloud storage, access control, CP-ABE, collaboration.**

I. Introduction

CLOUD computing has emerged as the natural evolution and integration of advances in several fields, including utility computing, distributed computing, grid computing, and service oriented architecture [1]–[3]. It promotes the concept of leasing remote resources rather than buying hardwares, which frees cloud customers (such as enterprises and individuals) from maintenance expenses. Cloud customers can utilize cloud services on a pay-as-you-use basis, where the price is relatively low. What's more, since services are provided via the Internet, customers can access applications and data anywhere and anytime. To benefit from the above advantages, but not limited to, an increasing number of enterprises and individuals are willing to outsource their data and applications to cloud platforms.

Despite many advantages of cloud computing, there remain various challenging issues that impede cloud computing from being widely adopted, among which, privacy and security of users' data have been the major issues. Traditionally, a data owner stores his/her data in trusted servers which are generally controlled by a fully trusted administrator. However, in public cloud storage, which is a popular service model in cloud computing, data are usually stored and managed on remote cloud servers which are administrated by a semi-trusted third party, i.e. the cloud service provider. Data are no longer in data owners' trusted domains and they cannot trust cloud servers to conduct secure data access control. Therefore, the secure access control has become a challenging issue in public cloud storage, in which traditional security technologies cannot be directly applied.

In recent years, many researches have been devoted on data access control in public cloud storage, such as [4]–[10]. Among those literatures, Ciphertext-policy Attribute-based Encryption (CP-ABE) is regarded as one of the most suitable schemes due to the fact that it can guarantee data owners' direct control over their data and provide a fine-grained access control service. In CP-ABE schemes, each user is associated with a set of attributes and every ciphertext is embedded with an access structure over some chosen attributes. The access structure is used to express the specific access policy that should be satisfied to access data contents. Only if a user's attribute set satisfies the access structure embedded in the ciphertext can he/she decrypt the ciphertext. Therefore, by using access structures over attributes to express access policies, CP-ABE is a promising tool to provide fine-grained, flexible, and secure data access control in public cloud storage.

Nevertheless, the existing CP-ABE schemes can merely assign access permission to individuals who own attribute sets satisfying the access policy. However, in many scenarios, the secret information cannot be obtained individually by a single user alone. For example, in enterprises and organizations, some important files/documents are shared among multiple users who have distinct responsibilities according to their positions, but have the same goal to protect data confidentiality. A data access request may be permitted only

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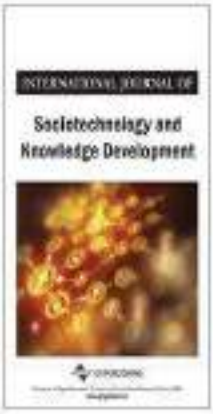
3. Pre-Processed Tweets for Secure Capital Market Analysis Using Cloud



Pre-Processed Tweets for Secure Capital Market Analysis Using Cloud

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Abstract

Huge crowds heading towards smart investment options' need a secure and trustworthy environment to earn good profits. Twitter, a social networking platform, is a major source generating huge information on share market consortium. People get excited when they come across the tweets that specify the shares yielding huge profits within a short time. Due to this, they end up tweeting about their credentials and amount they are willing to invest. It paves a path for the intruders to access confidential data and leave the common man in danger by gaining access and misusing the information. Towards this end, the goal of this work is to address the challenge of providing better inputs to the customers interested to invest in the share market in a secure way to earn better returns on investment. In this work, as a first module, pre-processing techniques are used to remove the unwanted characters from tweets. In the second part, to enhance the security, encryption module is developed, and the data is then stored in Cassandra. It is observed from results that the time taken to encrypt 100,000 tweets after pre-processing is 500 msec, and the time taken to decrypt the same set of 100,000 tweets is 50 msec, respectively. This shows the effectiveness of the proposed work in terms of attaining better and fast outcomes for a huge set of tweets after filling the voids by pre-processing techniques.

4. ON THE ANALYSIS OF COVID19 -NOVEL CORONA VIRAL DISEASE PANDEMIC SPREAD DATA USING MACHINE LEARNING TECHNIQUES RREGRESSION AND SIR MODEL

ON THE ANALYSIS OF COVID19 - NOVEL CORONA VIRAL DISEASE PANDEMIC SPREAD DATA USING MACHINE LEARNING TECHNIQUES – RREGRESSION AND SIR MODEL

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ABSTRACT- Corona virus are the gathering of viruses that cause different illnesses in birds and vertebrates. In humans, they cause a range of respiratory problems. This undertaking project presents the analysis of the transmission of COVID19 sickness and predicts the scale of the pandemic, the recuperation rate just as the casualty rate. Here utilized a portion of the notable Machine Learning techniques just as numerical modeling strategies, for example, Rough Set-Support Vector Machine (RS-SVM), Polynomial Regression, Bayesian Ridge Regression and SIR model.

1. INTRODUCTION

Viruses are microscopic organisms that reproduce only within a creature's live cells. Coronaviruses are one of the most well-known viral families that cause a variety of respiratory disorders in living beings.

One of the recent challenges has been determining the extent of Covid's distribution. Anticipating the pandemic with great precision will aid various countries in putting together a plan to combat the spread of infection. For modelling real-world situations, machine learning approaches are commonly used [13], [14]. Machine learning approaches, in particular, have recently been widely used to predict infections [4],[5],[8].

A portion of the customary methods utilized in guaging of a scourge incorporate time arrangement modeling just as regression modeling. We have picked a portion of the customary just as current machine learning techniques. Support Vector Machine technique has been generally utilized for forecasts while we have contrasted a portion of these customary techniques and a cutting edge technique specifically Recurrent Neural Network (RNN). As there is consistently an incredible level of

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5. Usage of Elliptic Curve Cryptography Technique for the Data Security and Privacy in the Wireless Sensor Network

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Natural Volatiles & Essential Oils

Usage of Elliptic Curve Cryptography Technique for the Data Security and Privacy in the Wireless Sensor Network

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Abstract

The protection of data from unauthorized access, use, introduction, intrusion, change, examination, recording, or destruction is known as data security. Wireless sensor networks (WSNs) are networks of sensors that are spatially dispersed and dedicated to monitoring and recording the physical conditions of the environment before transmitting the collected data to a central location. Security is currently regarded as one of the most critical issues in WSN development. The key issue in the effective execution of WSN is dealing with application security adequately. The purpose of this paper is to discuss the role of cryptography in WSN to improve data security. The goal here is to learn about another security strategy that uses cryptography to secure data in data centres.

Keywords: WSN, Secured data transmission, elliptic curve cryptography, encryption, decryption.

Introduction

Cryptography is the science of secret writing; the first documented use of cryptography occurred when an Egyptian scribe used non-standard hieroglyphs in an inscription. Cryptography has a wide range of applications, from diplomatic messages to wartime battle plans. With the use of computers and communications, new forms of untrusted medium have emerged, including virtually any network, particularly the Internet. Public key algorithms and private keys are the two main types of cryptography algorithms. The public key in cryptography is based on the intractable nature of certain mathematical problems. The first public key system is RSA, which is based on the assumption that it is difficult to put a whole number in mailmen with two large primordial mailmen.

The plain text message is written in simple English that anyone can understand. The message is encoded using cryptographic techniques known as cypher text message.

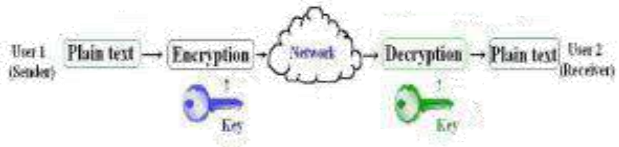

Fig. 1: Encryption and Decryption Mechanism

6. Prediction of Phishing Websites for Data Security Using Various Machine Learning Algorithms

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PREDICTION OF PHISHING WEBSITE FOR DATA SECURITY USING VARIOUS MACHINE LEARNING ALGORITHMS

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Abstract: Phishing is one in all the foremost threats during this net era. Phishing may be a sensible method wherever a legitimate web site is cloned and victim's area unit lured to the pretend web site to supply their personal yet as counselling, typically it proves to be expensive. Although most of the websites can provide a disclaimer warning to the users concerning phishing, users tend to neglect it. It is not a totally accountable action by the websites additionally and there is not a lot of that the websites might very do concerning it. Since phishing has been in persistence for an extended time, several approaches are projected in past which will find phishing websites however only a few or none of them find the target websites for these phishing attacks, accurately.

Our projected methodology tends to establish phishing websites employing a combined approach by constructing Resource Description Framework (RDF) models and mistreatment ensemble learning algorithms for the classification of internet sites. Our approach uses supervised learning techniques to coach our system. As our system explores the strength of RDF and ensemble learning ways and each these approaches work hand in hand, an extremely promising accuracy rate of 97% is achieved.

Index Terms **– Phishing, Logistic Regression, Support Vector Machine, Decision Tree, Random Forest, XGBoost Classifier**

Introduction

Phishing attack is a typical way of attack or fraud in which an attacker tries to learn sensitive information or data such as login or sign in credentials or account information by sending as a well-known entity or person in email or other communication channels. Typically, a victim or person receives an email or a message that appears to possess been sent by a known contact or organization. The message contains harmful software targeting the user's computer or has links to direct victims to malicious websites in order to trick them into communicating personal and financial information, such as passwords, account IDs or master-cued details. Phishing is popular among attackers, since it's very easier to trick someone into clicking a malicious link which seems legitimate than trying to interrupt through a computer's defense systems. These malicious links that are present within the body of the message are designed to make it appear that they go to the send up organization using that organization's logos and other legitimate contents. Many users without their knowledge click these phishing domain links every day and every hour. The attackers are targeting both the companies and the users. According to the MCSIR, released in February 2014, the annual worldwide impact of phishing could be very high as $5 billion. The main reason behind this is the lack of awareness of users. Security defenders must be responsible to take precautions to prevent users from confronting these harmful sites. Preventing these type of attack huge costs can start with making people conscious in addition to build strong security mechanisms which are able to detect and prevent these phishing domains from reaching the user. One of the common victims of these attacks are users of social media network sites. With the huge rise in the internet, the risk associated with phishing attack will also increase and criminals will always try to find new ways to deceive people. As phishing evolves, stakeholders will always find new ways of mitigating the risk associated with phishing.

7. Land Registration Using Blockchain Technology

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LAND REGISTRATION USING BLOCKCHAIN TECHNOLOGY

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ABSTRACT

The present Land Registration System is a time consuming process for the transfer of property ownership related to a land transaction. The data of the land is stored in a single place leading to security issues also. In some cases the incomplete/improper registration leads to dispute of ownership and litigations of the land. In this work, a land registration system using block chain is proposed to overcome the above mentioned limitations of the land registration system. The decentralised storage of data in block chain provides security and land owner data can be stored safely to avoid conflicts of land ownership. Land being an important asset, the use of bock chain technology can help improve this sector in its work implementation as well as its characteristics significantly for a seamless and hassle free work flow to achieve a reliable system.

Keywords : Land registration, blockchain, ethereum, smart contract, sellers, buyers

I. INTRODUCTION

The prevalence of CoViD-19 (Corona Virus Disease) pandemic created great havoc to not only to human lives but also to every essential sector ranging from private to government. People are instructed to stay safe at their homes rather than moving out unless and until required, following all the essential norms to protect themselves from the threatening pandemic. In such scenario, if property is to be purchased, then it will be a risk-filled necessity for the people to walk to the registration office for fulfillment of all the manual formalities to get the ownership. In the proposed land registration system, all phases from buying to selling of a land take place through the blockchain environment through their own smart devices, thereby overcoming the need to move around [1]. Also, during the CoViD (Corona Virus) Pandemic, there is a need to adopt the emerging technologies to offer a wide set of services to the users online rather than offline approaches. This may incur payments made by the users to acquire services in terms of goods or groceries ordered online to prevent the offline transmission of the disease. However, if the gateway is not a secure one, then the transfers made by the users may fall into wrong accounts and this creates a panic amongst the community to prefer online over offline options. If blockchain environment is used to serve the aforementioned purpose, then every entity across the network can access the ledger data and hence it gets easy to track the malicious nodes [2].Also, another aspect to be focused on is the adherence to regulations that is lagging in different blockchain variants.

Land Registration process requires a lot of paper work. The paper work takes a lot of time to complete the transaction of Land Owner updating. i.e. the land has already been sold by previous owner but the data in the server is yet to be updated. In some cases due to incomplete registration the land ownership is left uncertain. Documents might be forged through illegal processes to claim land ownership. other challenges faced in Land Registration.

8. Twitter Data Sets For Disaster Detection And Tracking

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Twitter Data Sets For Disaster Detection And Tracking

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Abstract

Nowadays lots of information we can see about disasters either man made or natural, but we don't have any tracking system which can be tracked or identify the disaster in previous before coming to a particular place. Here I have applied the BERT approach of machine learning algorithm which will classify the datasets after building a model with good accuracy of prediction. Also, we have taken datasets from www.iswsm.com website and divide www.iswsm.com disaster based datasets into training and testing sets. After pre processing and tokenized the data and build a model with the help of BERT and CNN deep learning algorithm and trained this model with less loss of data and optimized those models with ADAM to enhance the accuracy and efficiency of the model after deployment in the real life. Compare both models CNN and BERT the accuracy of BERT is high. This system also can be helpful in the area of medical, tourism and weather forecast to give prediction before anything happening.

Keywords: Tensorflow, CNN, Tokenizer, BERT, ADAM, binary_cross entropy, text2bert

Introduction

Disaster detection and tracking are the most important part of the disaster management, because if we know this problem before disasters have come then we can stop too much loss of human, animals, building and different type of resources. Also, we can provide appropriate resources to that place, where disasters are going to happen.

The given datasets for all the information and which type of disasters had happened and going to be happening. For example health issued disaster, flood, Tsunami, Haiti and etc. The main difficulty is to identify about in which place disasters and which type of disasters is going to happen and what datasets should be reprocessed. Because this data should be online and just before of disasters data need to preprocess. One more thing we need in order to keep in mind is that data must be correct and realistic. Noisy data and wrong facts will greatly affect the quality of the results. So, the main challenges are both to identify **high quality data** and mine it properly. Besides, we can regard data from online news agencies, and therefore managing **time issues** is a very important part about the detection of disasters and its tracking.

In the proposed application, our aim is to retrieve and analyze all instant online data at a given time. Algorithm part should be applied, which have to more efficient for the implementing the tool. Also data structure should be very important role play for developing more efficient and fast tool development. The whole project will be regarded as a Data Science project.

By using Machine Learning algorithm BERT, we will aim at determining which **place** and **incident type (disaster type)** are likely to happen given the captured data. Also here we have used CNN model to find out

9. Automatic Descriptive Answer Assessment Using Techniques Of Natural Language Processing

AUTOMATIC DESCRIPTIVE ANSWER ASSESSMENT USING TECHNIQUES OF NATURAL LANGUAGE PROCESSING

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Abstract

In educational institutions a major concern is evaluation of answer sheets of subjective type questions. Descriptive Answer Assessment Using NLP aims at making this time consuming and tedious task of correcting students answer scripts quite easy by utilizing the techniques of Natural Language Processing. The objective of Descriptive Answer Assessment Using NLP is to automate the process of evaluating descriptive answer scripts. Various algorithms are used to find the similarity between the reference answers and the student answer scripts. If the similarity is high, more marks will be awarded. Using several text similarity algorithms, the similarity and relative accuracy will be determined. Marks are assigned to students based on the degree of similarity with the student answer and reference answer. The project aims in exploring various Text Similarity algorithms in identifying their relative accuracies. The deliverables of Descriptive Answer Assessment Using NLP are a comparison of accuracy of various Text Similarity algorithms, student's marks displayed along with the reference answer which helps the student to know the errors made as well as the prescribed answer as soon as the exam is over. There are several advantages of using this automated system like it helps in reducing the time taken by faculty to correct the papers, the tests or examinations can be conducted online, the answers can be evaluated immediately, and it would be beneficial for universities, schools, and colleges for academic purpose by providing ease to faculties and the examination evaluation cell.

KEYWORDS: *Natural Language Processing (NLP), Text Similarity Algorithms, cosine similarity, Semantic Comparison, Synonyms*

1. INTRODUCTION

Evaluation of answer scripts is a major task in schools, colleges, universities etc. It is currently a manual process involving lot of human effort and consuming lot of time. Manual correction of answer scripts is tedious, time-consuming and error prone. Currently there are online or automatic evaluators only for multiple choice questions and none for descriptive answer evaluation the reason being the high ambiguity in natural language. With the advent of Natural Language Processing which is primarily an area of computer science and artificial intelligence concerned with the interactions between computers and human (natural) languages, we can have an automatic system to evaluate descriptive answers. Lexical semantics is a branch of NLP used to obtain the computational meaning of individual words in a context, which is the key in building an automated evaluation system to correct answer scripts. Descriptive Answer Assessment using NLP aims to evaluate descriptive answers using techniques of Natural Language Processing like Text Similarity, Semantic Comparison, Synonyms, Fuzzy Logic. The objective of Descriptive Answer Assessment using NLP is to automate the process of evaluating descriptive answer scripts. Different text similarity algorithms are implemented, and a relative comparison is made among the various algorithms. Marks are assigned to students based on the degree of similarity with the student answer and reference answer.

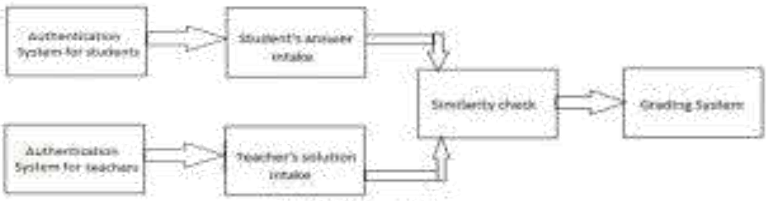

Fig 1. Block diagram

62.Exploration of Power Delay Product on Feedback Based DET Flip Flop 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"

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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.

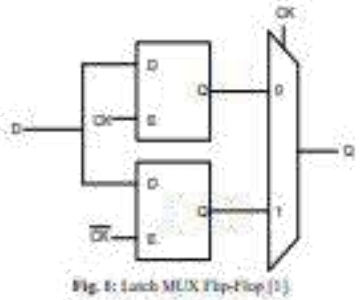

Fig. 1: Latch MUX Flip-Flop [1]

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.

63.Multi-Otsus image segmentation for Mammograms using Artifcial Bee Colony(ABC) Algorithm

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Multi-Otsu's image segmentation for Mammograms using Artificial Bee Colony (ABC) Algorithm

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Abstract:

Clear-cut image segmentation of mammogram images is indispensible in malignant tumor detection. This paper is attempted to propose a nature-inspired optimized method for mammogram image segmentation by adopting Otsu's multi-level thresholding algorithm as a fitness function into the ABC algorithm. Moreover, in image segmentation, Multi-level thresholding algorithms come across with insufficient exploration and less exploitation on search space. Hence, to solve this problem a Metaheuristic optimized algorithm is leveraged. This is achieved by using the ABC algorithm to explore the population space and exploit the specified population space to select the finest threshold values. Thereafter, the output of ABC is used to segment the mammogram image using the multi thresholding method. In this work, the proposed method is exercised with a total of nine images from the MINI MIAS database. Besides, to assess the performance of the proposed method different threshold levels are used to segment mentioned images. It was witnessed that the performance of the wished-for method is effective and efficient to segment the mammogram images in terms of measures like PSNR, SSI, and computational time.

Keywords: Artificial bee colony, Otsu, Multi-level Thresholding, Mammogram, Breast cancer

1. Introduction

1.1 Medical Image Segmentation

Mammogram images are currently most widely adopted technique in clinical practice to detect the breast cancer as it is easily accessible and cost-effective. For early detection of malignant tumors in mammogram images, many methods have been proposed [12]. Breast cancer mainly affects middle-aged women for different reasons. Over the past recently years, several methods are demonstrated to segment the medical images like X-ray, CT (computed tomography)-scan, Magnetic Resonance Imaging (MRI) Mammogram, etc. [1]. Homogeneous gray level values of pictorial muscle in preprocessed mammogram images exhibits effective intensity. Cancer detection false positive rate depends on the accuracy of image segmentation [16]. Image segmentation increases the visibility of microcalcification in processed mammogram images. In computer vision algorithms image segmentation plays a significant role [6]. There are six types of image segmentation methods, threshold-based, Artificial Neural Network (ANN) based, edge-based, clustering-based, watershed-based, region-based, and PDE-based methods[8]. Thresholding is the most popular segmentation method in medical image processing. In the bi thresholding method, the grayscale image is divided into two intensities i.e foreffront and background. But, multi thresholding divides the images into many homogeneous regions [13].

1.2 Otsu's Multi Thresholding

In automatic global threshold case studies, gray level images can be effectively segmented into bimodal (foreground or background) or multi classes using a **non-parametric and unsupervised Otsu's thresholding** algorithm. It is centered on a very simple idea: exhaustively search for the threshold that reduces the weighted with in class variance defined as σ_w^2 [22]. The class variances are given by (1) and (2) respectively

$\sigma_b^2 = \Sigma_{i=0} \quad (i-\mu_i)^2 P(i)/C_1) - \Sigma_{i=0} \quad (i-\mu_i)^2 p_i/w_i$

64.Alternative Approaches for Laboratory Learning and Assessment in Engineering Education - Open Source Alternatives

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ALTERNATIVE APPROACHES FOR LABORATORY LEARNING AND ASSESSMENT IN ENGINEERING EDUCATION - OPEN SOURCE ALTERNATIVES

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ABSTRACT

Laboratory and practical work are characteristic features of an undergraduate degree program in any engineering discipline. Trying to incorporate practical work successfully in to the engineering curriculum can present a number of challenges. Laboratory and practical work are expensive to run, sometimes requiring specialist equipment to be purchased that can rapidly become obsolete. Despite the challenges, the application of theory in a practical setting remains an expected and fundamental part of the engineering curriculum. The challenge now is for program teams to consider how the knowledge, skills and attributes that we desire to develop through such practical activities, can be facilitated in an appropriate, effective and efficient way within an engineering degree program for the 21st century. The aim of this review paper is to summarize the literature available in the form of books, journal papers and articles

65.Risk Prediction of Covid-19 based on Medical Reports

Risk Prediction of Covid-19 based on Medical Reports using Deep Learning(DL) Artificial Neural Network

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Abstract

The Covid 19which is caused by severe acute respiratory syndrome coronavirus 2. is declared as pandemic by WHO, is causing a major outbreak in more than 221 countries round the globe. It is rampant and having a severe influence on the well-being, economy and life of many people worldwide. It has destroyed the harmony and peace in the world as if a silent war declared by an invisible creature on humanity. Entire world is going through deep crisis. Most important and vital step to curb and fight against COVID-19 is to be able to trace and detect the person infected with virus as early as possible to save the life. However, there are many tests available now. We are proposing a Deep learning model based on the conventional Artificial Neural Network to detect this disease from laboratory reports which are in text form. Either there are no symptoms in the patient or there are specific abnormalities visible, using the reports data predictions can be made. From kaggle.com publicly available laboratory reports data was taken and was converted to a binary format for easy and fast processing. Various countries data was used in the experiments, which involved the training of deep learning and machine learning classifiers. We evaluated the performance of the models on more than 1000 records and achieved a sensitivity rate of 99%. We have used receiver operating characteristic (ROC) curve for sensitivity and specificity, precision-recall curve, average prediction, and confusion matrix. The performance of the model in terms of area under the receiver operating curve, sensitivity/ specificity, and precision/ recall was 0.99, o.80%, 100% and 0.98%, 100% respectively[1].

Keywords

COVID-19, artificial neural networks , deep learning, laboratory reports.

66.A Two-Level Authentication Protocol for Secure M-Commerce Transactions using AMQP Protocol

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International Journal of Mechanical Engineering

A Two-Level Authentication Protocol for Secure M-Commerce Transactions using Encrypted OTP

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Abstract—

Trading is the crucial and defacto factor of the world's economic growth, has a lot of impact on any country's GDP. Trading has remarkably changed its shape from the ancient barter system to the latest mobile commerce because of enhancements in technologies, the Internet, the use of digital currency and human beings livelihood, and in this pandemic situation of CARONA where everyone is focusing on online/digital trading.

Because of upgradations in technology usage and a drastic improvisation in hardware front, the entire computational devices and mobile phones have changed their mode of usage, where 90 percent of market users are using palmtops, laptops and smartphones and the human beings lifestyle is also drastically changed where they want everything on a single click through mobile apps irrespective of time and location (anytime from anywhere). The so-called e-commerce is merged with mobile communications, which emerged into mobile commerce.

Mobile commerce, also called mobile e-commerce or m-commerce, is defined as all activities related to a potential commercial transaction conducted through communications networks that interface with wireless or mobile devices. Mobile Commerce addresses electronic commerce via mobile devices, where the Consumer is not in physical or eye contact with the goods that are being purchased.

The advantages are massive with mobile commerce from the customer's point of view and the manufacturer's point of view. However, there are also many complexities and network security issues involved with this mobile commerce, which doesn't allow many mobile users to opt for m-commerce transactions.

Many Cryptographic security algorithms and communication protocols were utilized to build a robust payment system for mobile commerce, but they still need some ifs and buts. This paper provides a "Two-Level Authentication Protocol for secure M-Commerce Transactions using encrypted OTP" using any conventional or public-key cryptosystem algorithm and any one of the Messaging Protocols.

The Solution provided in this paper will overcome two major security attacks called "Replay Attack" and "Man in the middle attack."

Keywords: M-Commerce, Cryptography, Authentication, E-Commerce, AMQP, Replay Attack, Man in the Middle Attack.

I. INTRODUCTION

Mobile commerce represents online transactions using cell phones, tablets pc, and any other handheld devices. These online transactions are due to online shopping or any other cash transactions. Nowadays, everyone uses Google pay, phone pe, and Paytm applications for transactions, and every bank provides a UPI facility[1].

M-commerce accounted for 34.5 percent of all e-commerce sales in 2017. M-commerce has the most significant impact on the small scale industry to large scale industries. Using this m-commerce, bill payment for utilities became very easy. Even though there are so many advantages, we have to concentrate on the security issues of m-commerce[2].

II. WIRELESS SECURITY

A. *Public-key cryptography*

Public key cryptography (PKC) is employed to exchange a personal key or symmetric key utilizing a certificate, and there, in any case, the transmission is encrypted using the transferred key. Small key size of 40 bits is employed due to power restriction. Here WIM(Wireless Identity Module)is a component of the WAP Architecture to store private data securely (Keys pairs, Certificates, PINs) within mobile devices which can be a tamper-proof component[3,4,5]. In practice, a WIM is implemented by employing an open-end credit. WAP 1. x technology uses Wireless Terminology (WML).

67..A SURVEY ON TIME SERIES PREDICTION USING MACHINE LEARNING

68. Pluto: AI- Based Meeting Scheduler

Title

Pluto: AI-Based Meeting Scheduler

Authors

Dr Sridevi Tumula
Sai Vinitha Yeggadi
V. Indira Priyadarshini

Abstract

Scheduling a meeting manually is a low level but is a time-consuming task. It cannot be done in a single go; instead, it takes multiple emails with several backs and forth negotiations over the date and time. To solve this problem and make this process automated, this scheduler is introduced. By conversing with this virtual assistant, the user can initiate a meeting by specifying the dayparts/time and set of participants for the meeting. This system's main aim is to schedule a meeting efficiently, i.e., without conflicts and with minimum user interactions. The system interprets user utterance using Intent Classifier followed by Name Entity Recognizer. Multi-Label Classifier maps initiator's utterance (example afternoon) to multiple possible time slots. After estimating time slots, Reinforcement Learning is used to select an agreeable timeslot. Based on the prior experience of scheduling meetings with different users in the system, the reinforcement learning-based bot attempts to choose slots with the maximum probability of participants agreeing. The agent will automatically schedule an appointment and tag the conference details to the user's calendar.

Key Words

Agent , Scheduling,Process Automation,Virtual Assistant,Classifier,Reinforcement Learning

Cite This Article

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69.A Novel Video Watermarking Algorithm using DTCWT

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A Robust Image Watermarking Technique using DTCWT and PCA

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Abstract

The dual-tree complex wavelet transform (DTCWT) is a relatively recent enhancement to the discrete wavelet transform (DWT), with beneficial properties such as shift invariant, good directionality, perfect reconstruction. These properties are well utilized to obtain improved robustness and perceptibility. Principle component analysis is used as a predictive model and is an excellent technique for inserting the watermark in the host image. The watermark energy is distributed in the principle component of DTCWT sub bands in order to improve robustness and perceptibility of watermarking algorithm. Performance parameters are evaluated. PSNR is 59 db and correlation coefficient is 1. The algorithm is resistant to geometrical attacks.

Keywords: DTCWT, PCA, 2D signal spectrum, 2D DWT, Digital Watermarking.

INTRODUCTION

Creating a digital copy, transmitting and distributing have become a daily routine of multimedia technology in internet era. Digital image watermarking provides copyright protection, by hiding appropriate ownership information in digital images. This ownership information may be in the form of logo or called as 'watermark'. The image formed after hiding 'watermark' in original image is called 'watermarked image'. There are four essential parameters [3], which are commonly used to determine quality of watermarking scheme. They are robustness, perceptibility, payload, and security.

Robustness is a measure of immunity of watermark, against intentional attacks like image processing attack or geometrical attack, like compression, filtering, rotation, scaling, [3] resizing, cropping etc. Imperceptibility means quality of host image should not be destroyed by presence of watermark. Payload is the number of bits to be embedded in cover image. It is called 'watermark capacity'. Security is ability to secure and resolving the rightful ownership. The effective attack handling is essentially required during testing of image watermarking techniques.

RELATED WORK

There has been a drastic increase in the research of watermarking. To develop an efficient watermark algorithm literature survey involves extensive study of journals, research articles and through light on this research.

Marzieh Amini et.al [1] proposes watermark algorithm using DWT and principle component analysis. The robustness of the algorithm is improved compared to the previous work. Baolong et.al [4] developed a robust watermark algorithm using DTCWT and mean quantization technique to enhance embedding capacity to 1024 bits and robustness against all attacks and also achieves PSNR 40 to 42db. Kovitala Nagavardhani [5] proposes DWT and block based PCA watermarking algorithm which improves the bit error rate and also robust against all geometric attacks. Ho Anthony T.S. [6] et.al proposes a system for an authentication application using histogram and fast Hadamard transform to achieve correlation factor of 0.96.

The paper is organized as follows: Section 1 introduction, section 2 explains the DT-CWT, PCA and watermarking technique. Section 3 experimental results. Section 4 conclusion and 5 is the references.

Dual Tree Complex Wavelet Transform (DTCWT)

The standard DWT is a very powerful tool for many signal processing applications. But it suffers from three major limitations like shift sensitivity, means shift in the input leads to large [2], changes in the coefficients of the filter. Poor directivity example inability to distinguish between +45° and −45° spectral features. Absence of phase information. These problems can be solved by DTCWT [2] .The DTCWT for 2-D image is obtained by separate filtering along rows and then columns. However, if row and column filters both suppress negative frequencies, then only the first quadrant of 2-D signal spectrum is obtained. The most computationally efficient way to achieve a pair of conjugate filters is to maintain separate imaginary operator j1 and j2 for row and column processing as in Fig. 1 The input image X is

2

Location-Aware Keyword Query Suggestion Techniques With Artificial Intelligence Perspective

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Abstract

The user is interested in retrieving the more relevant and useful information from the search engines; to get this, we need an appropriate query to search. Framing an appropriate query, which is based on some suggestions, is more important in the fast-growing ICT world. In these days, the user-specific and location-based queries are more relevant. With the huge adoption of mobile and handheld devices in our regular life, the pace of search engines has changed, and every user is expecting more appropriate search results for him; based on this, many recommendation systems are working. Artificial Intelligence (AI) has changed in many aspects of the human being. In this work, we are using the AI for query suggestion based on the user relevant information, and it gives more accurate results. It has changed the query suggestion strategy. Most of the mobile and handheld devices contain user data and their preferences. The existing search engines are working based on the page rank principle. But, the perspective has changed due to the mobile devices and Global Positioning System (GPS) services, with the increased usage of location-based devices and the availability of the internet, which prompted us to work on this problem. Most of the existing search engines help the user to get the required data based on the user query, but not based on the location. The query suggestion will help the users with precise query suggestions to search on the web. While searching on the web with an appropriate query will retrieve the good results. The query suggestion is a key reason in the search engines to optimize performance. As the usage of mobile

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71.Pre-Processed Tweets for Secure Capital Market Analysis Using Cloud

Pre-Processed Tweets for Secure Capital Market Analysis Using Cloud

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Abstract

Huge crowds heading towards smart investment options need a secure and trustworthy environment to earn good profits. Twitter, a social networking platform, is a major source generating huge information on share market consortium. People get excited when they come across the tweets that specify the stories yielding huge profits within a short time. Due to this, they end up revealing about their credentials and amount they are willing to invest. It paves a path for the intruders to access confidential data and leave the common man in danger by gaining access and misusing the information. Towards this end, the goal of this work is to address the challenge of providing better inputs to the customers interested to invest in the share market in a secure way to earn better returns on investment. In this work, as a first module, pre-processing techniques are used to remove the unwanted characters from tweets. In the second part, to enhance the security, encryption module is developed, and the data is then stored in Cassandra. It is observed from results that the times taken to encrypt 160,000 tweets after pre-processing is 540 msec, and the time taken to decrypt the same set of 160,000 tweets is 50 msec, respectively. This shows the effectiveness of the proposed work in terms of obtaining better and fast outcomes for a huge set of tweets after filling the voids by pre-processing techniques.

72.Trust Computation Model For Iot Services Using Machine Learning

TRUST COMPUTATION MODEL FOR IOT SERVICES USING MACHINE LEARNING

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S.Sailekya
Prowess entp

The Internet Of Things allows us to access a bulky quantity of insightful information on each participate entity in the ecosystem. This imposes several threats like data management and possible bias enable by data analytics over sensitive information like location, interests and activities. To overcome the above mentioned issues trust concept is considered as an important aspect . With concept of trust humans will be provided support in the perception of uncertainty and risks before making any decisions. though, in cyber physical world it is difficult to build a trust model since there is large amount of diversified information which depends on varied factors. consequently, intelligent trust computation model is required to generate accurate and intuitive trust values for all the nodes in the eco system. Therefore, the proposed element in this work is a quantifiable trust assessment model. Individual trust values will be computed numerically and a machine learning based model will be generated which aggregates the trust attributes and combine them to compute the final trust values which will be used for potential decision making.

key words : IOT, Trust computation, eco system.

1. INTRODUCTION

Internet of things contains million devices over the internet which establish communication among them. In IOT contains homogeneous or heterogeneous devices in communication .These devices communicate with sensors and many several other APIs enable communication among these heterogeneous or homogeneous devices. Internet of Things (IoT) provides wide applicability in many productive sectors. These set of opportunities can be utilized by users,

73. Assessment of Descriptive Answers in Moodle-based E-learning using Winnowing Algorithm

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Assessment Of Descriptive Answers in Moodle-based E-learning using Winnowing Algorithm

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Abstract: Assessment in education allows for obtaining, organizing, and presenting information about how much and how well the student is learning. An automatic evaluation tool is proposed that allows the assessor to evaluate descriptive answer at any time and receive instant feedback of the students. Due to the lack of descriptive answer grading in Moodle-based E-learning system, there is a need to build a model and also add this feature as a plug-in for the E-learning system .Up until today, most assessors still choose to examine descriptive document manually for each student document. This method takes time where assessor needs to be focused and thorough while examining a number of descriptive documents. This reason often affects essay examinations to be less objective and not optimal. To improve objectivity, time efficiency and fair correction in descriptive answers assessment process, a system is needed that can automatically assess student documents, or in other words a descriptive answer evaluating system. An evaluation of descriptive answer system, works by analysing student answer document with model answer document. The higher the semantic similarity, the higher the score obtained.The purpose of this paper is to check the similarity between the teacher's answer and the student's answer using Winnowing algorithm. Winnowing algorithm is one of the document fingerprinting algorithms that can be used to detect document similarity by using hashing technique. The fingerprint document itself is a method used to detect document similarities with other documents. The Winnowing algorithm has fulfilled one of the requirements of the plagiarism algorithm, which is whitespace insensitivity, disposing of irrelevant characters such as punctuation. The similarity value is calculated using Jaccard Coefficient. Later this assessment is used for grading the student's performance.

Keywords: Moodle-based E-learning system, Winnowing Algorithm.

I. INTRODUCTION

Evaluation and Grading perform a main task in the educational method. Analysis of pupil functionality is crucial as that would help the educators comprehend the degree of each student. It's important to review the amount of understanding that has been soaked up by the trainee. For this, one needs to find out the level of discovering of a student through performing some composed test of details pattern which may feature detailed or even unprejudiced inquiries or even with some functional examination and also analyzing it to locate the level of discovering. After the exam, the instructors spend the majority of their opportunity for analyzing the signs of the trainees and also the examination gets majority consumption of individual attempt, opportunity and also expense. An automatic assessment analysis system can lower the initiatives in the course of the assessment. Lots of architectures and attributes have been recommended for detailed response assessment. The strategies are mostly based upon keyword match, sequence match, but semantic analysis of detailed response is still an open problem.

Online resources that sustain managing of on the internet evaluations such as Moodle and also Zoho are based on strand matching method for short answers however lengthy solution examination is still handled personally by most units.

The assessment of detailed responses is still a concern. A major problem among the existing bodies is their effectiveness. The issue related to the assessment of individual solutions is that each trainee has his/her means of answering and it is complicated to find out the level of correctness. The majority of extensively used AES devices are Project Essay Grader (PEG), Smart Essay Surveyor (IEA), E-rater, IntelliMetric and also Bayesian Essay Test Scoring System (BETSY).

The necessity in the growth of Computer-based Examination Units (CAS) has increased significantly in the final handful of years, due to both the boost of the number of pupils joining educational institutions and to the options supplied by e-learning techniques to asynchronous and also common education and learning.

74.Deep Learning Approach For Automated Screening of Malaria Parasite

DEEP LEARNING APPROACH FOR AUTOMATED SCREENING OF MALARIA PARASITE

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Abstract : Malaria is a life-threatening disease caused by Plasmodium parasites that infect the red blood cells (RBCs).According to the 2018 World Health Organization (WHO) report, an estimated 435,000 malaria- related deaths are reported globally. Children under 5 years of age are reported to be the most vulnerable, accounting for 61% of the estimated death counts. Early diagnosis and treatment is the most effective way to prevent the disease. Manual identification and counting of parasitized cells in microscopic thick/thin-film blood examination remains the common, but burdensome method for disease diagnosis. Its diagnostic accuracy is adversely impacted by inter/intra-observer variability, particularly in large-scale screening under resource-constrained settings.The primary aim of the paper is to overcome these inter/intra-observer variability or errors that occur as a result of these by automating this process using Deep Learning Algorithms like Convolutional Neural Network (CNN) in such a way so as to have the maximum accuracy. These CNN's can be used to detect whether a Red Blood Cell stained with a chemical Giemsa is infected with Malaria or not. The Malaria Cell Image Dataset provided by Kaggle consisting of a total of 27,558 images of the blood cells is being used to train the model. This data can be used to train various pre trained CNN models like ResNet- 152, WideResNet101-2 as they have low top-1 and top-5 errors. Instead of using the pretrained models as it is, we can unfreeze the already existing layers and modify the layers to suit our dataset. The dataset will also be tested using SGD+Nesterov+Momentum,Adam AdaGrad, AdaMax, optimizers and the best combination would be used for the final model.This CNN model would then be either deployed directly in an Android Phone or can be deployed in a remote web server to which images can be sent, processed at the server and results sent back..

Index Terms **-,Convolutional Neural Network, Ada Grad, Ada Max optimizer.**

I. Introduction

Medical image analysis (MIA) is an interdisciplinary field at the intersection of computer science,information engineering, electrical engineering,physics,mathematics and medicine. This field develops computational and mathematical methods for solving problems pertaining to medical images and their use for biomedical research and clinical care.

The main goal of MIA is to extract clinically relevant information or knowledge from medical images. While closely related to the field of medical imaging, MIA focuses on the computational analysis of the images, not their acquisition.

Malaria is a mosquito-borne infectious disease that affects humans and other animals.Malaria causes symptoms that typically include fever, tiredness, vomiting, and headaches.In severe cases it can cause yellow skin, seizures, coma, or death.Symptoms usually begin ten to fifteen days after being bitten by an infected mosquito.If not properly treated, people may have recurrences of the disease months later.

Blood smears are used for detection of malaria where they are stained with a chemical called Giemsa which stains the Red Blood Cells(RBC's) which give the RBC's a distinguishing color when there is a presence of the Malaria parasite which we make use.

75.AI-based Subject- to- Subject Motion Transfer

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AI-based Subject-to-Subject Motion Transfer

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ABSTRACT

The main aim of this study is to transfer motion extracted from one image for a single subject and apply it to a subject in the other image. The problem is of video-to-video motion transfer where we use pose as an intermediate representation. To transfer motion, we extract poses from the source subject and apply them to the target subject using pose-to-appearance mapping, from all the poses extracted from the target subject. The input and output medium for this study can be in the form of still images, or video that would show/contain multiple poses of the source and target subject. The poses extracted from the source and target medium need not match exactly, as we will only be using 3d pose mapping of the target images to generate matching poses for the source image, while predicting consecutive frames for generating smooth videos.

Potential applications of this study currently include various techniques that can be used to detect fake videos on the Internet, entertainment purposes like targeting multiple subjects to synchronize with coordinated motion (that can be used as filters on social media platforms). One other potential application can be that of 3D model-based image generation that can be used in video games like NBA to make football players dance, even when we do not have original models for the players dancing.

Keywords: Pose Extraction , Pose Estimation, Video Motion Extraction, GAN, FACE-GAN.

INTRODUCTION

In art, there are certain movements used by the artist to express what they intend to say, and how they intend to say it. These artistic movements are classified into many categories over several millennia. Some categories of art include 19th century Impressionism and Realism [1] used in France, or the 18th century Romanticism [2]. Some of these movements use minimal colors to express, some try to use minimal strokes, while others use to keep it as close to as natural without any modifications from the author, while the others use their own imagination to express something that they have only heard through word of mouth or artistic recreation of writings.

Art in the form of paintings express a person view of the world or what they want to say to the world. The artistic movements mentioned above are unique to the person that started it, but there have been instances of people trying to copy style of other forms and apply it to their own paintings. With the evolution of Modernism and Post-modernism styles of art, the old art forms are now considered old and are preserved for histone significance. This form of style transfer is performed digitally through a technique called Neural Style Transfer.

Style transfer of images, as mentioned is not something new and has been explored before as mentioned in section Neural Style Transfer above. Some of them used "image analogies", while the others use artificial intelligence applications to get similar results. But all of them worked on transferring style between images only. Whereas this work focuses on do the same for video under a different context.

Terminologies/ Methodologies

Neural Style Transfer:

"Neural Style Transfer (NST)", refers to a class of software algorithms that allow transferring art style between images through various forms of digital image manipulations. NST is a form of image stylization under the category of non-photorealistic rendering.

76.Android Application for Automation of Health Consultancy

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Android Application for Automation of Health Consultancy

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Abstract: ***The main aim of this work is to predict the drugs based on symptoms and other details provided by user using various machine-learning techniques, technologies and drug- development and clinical-trial data from various web sites. The outcome this work is an interactive application where the user can utilize the features provided. As part of this work, data is extracted first from various web sites using Data Scraping Technique. Then predicts the disease and drugs based on the details available in the data set. With the help of Support Vector Machine Algorithm the disease and drugs are predicted. We suggest these to the users through application. The main aim is to provide the user with most suitable disease and recommend best drug, through user-friendly application. In this work, first we find the data from drugs and clinical data present in online web pages using web scraping and developed Android application to communication with the users. Based on the symptoms provided by user, the system predicts the disease they have and the medication.***

Keywords: Web scraping, classification, Feature Extraction, Drug and Disease Prediction.

I. INTRODUCTION

As India started modernizing at a steady pace, the country has been slowly catching up with the rest of the world. One of the fruits of advancement is the surge in the use of internet in India. But, most of the internet usage is being spent on entertainment. Consequently, this resulted into a situation where the users are unaware of facilities that the internet can provide, such as medical assistance. Since there is poverty in the country mostly in the rural areas, technology needs to be introduced to counter the issue where doctors are not properly qualified or not entirely present in some areas. Lack of medical personnel can lead the general public taking the matter into their own hands, like taking medications that are recommended by person who is not aware of the dosage levels and the possible side effects. This can be avoided with the online medical assistance.

Developing an application that provides medical support to the users by mentioning their disease and suggesting medicines required to cure the disease. The predictions are based on the personal details, symptoms and extent of the symptoms. It provides the suggestions from drug and clinical data present in the online web pages. Drugs can be detrimental if they are used without prior knowledge of dosage levels. The dosage also varies with regarding to age, sex and various other factors. This issue could be countered if the individual is taught about the possibilities of the symptom which can motivate the patient to take the extra mile and get proper help immediately. This study provides the user with enough support regarding their diseases and recommends drugs and aid in case of inevitable self-medication. This is done through a user-friendly application that can understand the issues of the user accurately.

II. LITERATURE SURVEY AND METHODOLOGIES

Web Scraping [2] is important technique used for extracting unstructured data from the websites and transforming that data into structured. Web scraping is a form of data mining. The basic and important aim of the web scraping process is to mine information from a different and unstructured website and transform it into an comprehensible structure like spreadsheets, database or a comma-separated values (CSV) file. Data like item pricing, stock pricing, different reports, market pricing and product details, can be gathered through web scraping. Extract targeted information from websites contributions to take effective decisions in business process.

BeautifulSoup is a Python library used for parsing documents (i.e. mostly HTML or XML files). Using Requests to obtain the HTML of a page and then parsing whichever information you are looking for with BeautifulSoup from the raw HTML is the quasi-standard web scraping "stack" commonly used by Python programmers for easy tasks.

Selenium Python bindings provides a simple API to write functional/acceptance tests using Selenium WebDriver. Through Selenium Python API you can access all functionalities of Selenium WebDriver in an intuitive way.Selenium Python bindings provide a convenient API to access Selenium WebDrivers like Firefox, Ie, Chrome, Remote etc. The current supported Python versions are 2.7, 3.5 and above.

77. Security and Privacy Attacks on Machine Learning Algorithms

Security and Privacy Attacks on Machine Learning Algorithms

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Abstract- Machine Learning has gained a significant increase in popularity in the recent times. ML models are being used in almost every other field including medicine, finance and many more. As machine learning has increasingly been deployed in critical real-world applications, the dangers of manipulation and misuse of these models has become of paramount importance to public safety and user privacy. In applications such as online content recognition to financial analytics to autonomous vehicles all have shown to be vulnerable to adversaries wishing to manipulate the models or mislead models to their malicious ends. Technical community's understanding of the nature and extent of these vulnerabilities remains limited even though there has been a growth in recognition that ML exposes new vulnerabilities in software systems. Identifying various types of privacy and security attacks possible on ML models and demonstrating these attacks is the focus of the project. For security part adversarial attacks on Machine Learning models will be introduced and privacy part model inversion attack and membership inference attack will be performed to show that ML models leak information.

Keywords – Security and Privacy, Machine Learning, Security Attacks, Privacy Attacks

I. INTRODUCTION

Security and Privacy in Machine Learning has been in research and continues to be as Machine Learning models are vulnerable to several types of attacks. Machine Learning is the electricity and foundation of modern technologies and plays significant role in growing web-based services because of its wide applications. It is provided as service by Amazon, Google, Microsoft and many more. These companies provide services like training API, where the user can upload data to the cloud and train the model for example, a classification model. Later, user can use these models using prediction API's and do prediction. Prediction output is vector of probabilities that assign probability to each class to classify the object.

Example in the CIFAR-dataset, it takes a picture of a Car and assigns probability to the classes to predict whether it is a car, truck, airplane, submarine, cratters. These training API's are good examples of black box models, where the training model stays on the cloud and the user has no information about the architecture or parameters of the model, just can get the prediction vector. The prediction outputs have no information of the model nor information on predictions of the intermediate steps. Such black box models are very useful. Many mobile application developers use such services to predict the responses of the new features. There is no access to the training datasets of the training model, so when the prediction is made, there is no interaction with the dataset of the machine learning model, only the prediction vector is given as the output.

The understanding of the threats, attacks and defences of systems built on ML is fragmented across several research communities including ML, security, statistics, and theory of computation. This motivates and challenges people to put effort to systematize knowledge about the myriad of security and privacy issues that involve ML. Most of the Machine Learning models which are in use right now are not completely robust and they do not preserve the privacy of users. Big companies have invested a lot in this area and are trying to improve the models. There have been significant improvements like amazon recognition was initially was not immune to adversarial attacks, but now they have improved their robustness and are immune to these attack.

Various security and privacy attacks on machine learning models have explored the attack surface of systems built upon ML. They have painted a picture about the vulnerabilities of ML and the theoretical countermeasures used to defend against. Defences for all the attacks are yet unknown, yet a science for understanding them is slowly emerging[1]. Recent findings on adversarial examples for deep neural networks have also summarized few methods for generating these examples. They further discussed about countermeasures for adversarial examples and explored the challenges and the potential solutions[2].

Model Inversion Attacks that Exploit Confidence Information and Basic Counter measures. Model inversion a privacy attack in which the attack gets adversarial access to an ML model and abuses it by learning sensitive genomic information about individuals. It showed how to recover recognizable images of people's faces given only their name and access to the ML model. Inspecting facial recognition APIs, it turns out that it is common to give floating-point confidence measures along with the class label (person's name). This enables us to craft attacks that cast the inversion task as an optimization problem. They found the input that maximizes the returned confidence, subject to the classification also matching the target[3].

Membership Inference Attacks Against Machine Learning Models focused on how machine learning models leak information about the individual data records on which they were trained. Their focus was mainly on basic membership inference attack, determining whether a data record or a sample is present in the model's training dataset. To perform membership inference against a target model, a shadow model and attack model were trained to recognize differences in the target model's predictions on the inputs that it trained on versus the inputs that it did not train on[4].

The rest of the paper is organized as follows. Proposed algorithms are explained in section II. Experimental results are presented in section III. Concluding remarks are given in section IV.

78.A Literature Review on Virtual Machine Selection techniques for Virtual Machine Placement

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A LITERATURE REVIEW ON VIRTUAL MACHINE SELECTION TECHNIQUES FOR VIRTUAL MACHINE PLACEMENT

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Abstract: Virtualization is a key technique in cloud computing and it enables scalable delivery of services. Virtual Machine (VM) consolidation can become complex due to heterogeneity in resources, scalability of resources on demand, temporary and dynamically varying workloads, etc. VM Placement does allocation of resources for virtual machines based on workload and it is base for the VM consolidation. VM Selection plan selects the appropriate virtual machine from an overloaded host for migration. Proper VM Selection for migration enables to improve Host performance, reduces migration time and bandwidth, improves quality of service, and reduces average energy consumption of data center. Hence there is a need for efficient VM Selection and VM Placement techniques to reduce migration latency and bandwidth, and to consolidate workload on fewer physical hosts and thereby reduce energy consumption. This paper presents a literature review on Efficient VM Selection techniques along with the comparison in various metrics among them.

Index terms- **Virtual Machine, VM Selection, Energy consumption, CPU, Host**

I. INTRODUCTION

Data Centers housing large number of IT equipment such as servers, data storage, network devices, power and cooling devices etc. facilitate the development of varied services offered by the cloud. With the quick development of IT industry and increasing call for cloud services, the number of data centers have increased. These data centers consume large amount of energy to process its services which leads to increased energy consumption.

Today, the price of the energy a typical computing server consumes during its lifetime exceeds its purchase cost, and large scale computing and network systems are being established near power stations to reduce power transmission losses. In Grids and data centers, computing and networking equipment such as PCs, switches, routers, and servers powered on, even if they are idle which results in wastage of energy. The power consumption by computing facilities increases various financial, environmental and system performance concerns.

This growing energy consumption problem can be dealt using Virtualization in cloud computing. Using virtualization, several operating systems can be run in parallel, in the form of virtual machines, in a single host machine. Hypervisor or virtual machine monitor is responsible for abstracting physical machine hardware and allocate virtual hardware for VMs to process cloud workloads. VM Placement does allocation of resources for virtual machines based on workload and it is base for the VM consolidation. VM Selection plan selects the appropriate virtual machine from an overloaded host for migration. Proper VM Selection for migration enables to improve Host performance, reduces migration time and bandwidth, improves quality of service, and reduces average energy consumption of data center. Hence there is a need for efficient VM Selection and VM Placement techniques to reduce migration latency and bandwidth, and to consolidate workload on fewer physical hosts and thereby reduce energy consumption.

There are two types of VM Consolidation: static and dynamic. In the Static VM Consolidation, virtual machine monitor allocates the physical resources to the virtual machines based on peak load demand which may lead to resource wastage because always workloads may not be at peak. In the dynamic consolidation, virtual machine monitor changes the VM size or capacity according to the current workload demand which helps to use data center resources efficiently. And VMs can be dynamically reallocated among the PMs (Physical Machines or hosts) according to their resource demand which minimizes the number of active hosts required to handle the workload.

79. A Review on Energy Efficient Virtual Machine Placement Techniques

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A REVIEW ON ENERGY EFFICIENT VIRTUAL MACHINE PLACEMENT TECHNIQUES

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Abstract: Virtualization is a key technique in cloud computing and it enables scalable delivery of services. Virtual Machine (VM) consolidation can become complex due to heterogeneity in resources, scalability of resources on demand, temporary and dynamically varying workloads, etc. VM Placement does allocation of resources for virtual machines based on workload and it is base for the VM consolidation, hence there is a need for efficient VM Placement techniques to consolidate workload on fewer physical hosts and thereby reduce energy consumption. This paper presents a detailed review on Energy-efficient VM Placement techniques along with the comparison in various metrics among them.

Index terms- **Virtual Machine, VM Placement, Energy consumption, CPU, Host**

I. INTRODUCTION

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There are two types of VM Consolidation: static and dynamic. In the Static VM Consolidation, virtual machine monitor allocates the physical resources to the virtual machines based on peak load demand which may lead to resource wastage because always workloads may not be at peak. In the dynamic consolidation, virtual machine monitor changes the VM size or capacity according to the current workload demand which helps to use data center resources efficiently. And VMs can be dynamically reallocated among the PMs (Physical Machines or hosts) according to their resource demand which minimizes the number of active hosts required to handle the workload.

Figure-1: VM Placement process

80.A Survey on Contactless Gesture based Interactions

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A Survey on Contactless Gesture based Interactions

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Abstract: ***Gesture Based Interaction is the mathematical interpretation of human motion by a computing device. Contactless Gesture Based Interaction with devices aims to offer new possibilities to interact with machines thereby enabling development and design of far more natural and intuitive interactions with computing machines. The system makes use of static and dynamic gestures in order to perform operations on a system. This paper provides a detailed review on contactless systems which facilitates a better means of interaction between humans and machines.***

Index Terms : Contactless Gesture Based Interaction, finger segmentation, contours

I. INTRODUCTION TO CONTACTLESS SYSTEMS

One of the major ramifications of the Covid-19 crisis has been the increasing apprehension with regard to contact with foreign surfaces and by extension foreign objects. A wide range of routine utilities such as ATMs and groceries depend on contact for their successful operation, for instance when confirming transactions for the former and whilst generating bills for the later. This forms the gist of the problem which is proving to be a burden on a day to day basis. This impediment has led to uncertainty with regards to safety. Now more so than ever there is a strong emphasis on ensuring safety through minimal contact. This has led calls for systems that fulfill the specified requirements whilst ensuring safety and ease of use. This is where Contactless Gesture Based Interaction with Devices can be essential. It aims to simplify the mathematical interpretation of motion by a computing device and enable the gradual move away from peripheral devices to the use of dynamic interactive devices which eliminate the concept of touch from everyday tasks. Modern research is tending to move from standard peripheral devices such as mouse, keyboard, touch screens etc. to remotely commanding computers through speech, emotions, and body gestures. This project belongs to the domain of hand gesture recognition using video image processing and pattern recognition to interact with the device. In the existing system the users use peripheral devices such as keyboard, mouse, or touch screen to interact with the devices. This has sufficed for generations, but as mentioned earlier the apprehension regarding coronavirus has effectively made these redundant as people who would earlier operate these are dissuaded from the same due to risk of physical contact. Therefore, one would assume that voice-based systems are the future but there are certain inefficiencies in them too. There are quite a few voice based interaction systems although they leave much to be desired in terms of effectiveness and need improvement. We aim to further improve on these systems to provide a rich set of features for easy use. A prominent use of gesture-based interaction is using video game remote controllers to control various actions with gestures, although these aren't appropriate for day to day utilities as they would require a controller to control operation as well as being expensive.

II. RELATED WORKS

Various methods have been adopted for facilitating contactless interaction.

A. Hidden Markov Model based Dynamic Hand Gesture Recognition System using OpenCV

A novel and faster system for dynamic hand gesture recognition by using Intel's image processing library OpenCV. Many hand gesture recognition methods using visual analysis have been proposed: syntactical analysis, neural networks, the hidden Markov model (HMM). A HMM is proposed for hand gesture recognition. The whole system is divided into three stages: detection and tracking, feature extraction and training and recognition. The first stage uses a more non-conventional approach of application of Luβ colour space for hand detection. While the process of feature extraction is the combination of Hu invariant moments and hand orientation. For the training, Baum-Welch algorithm using Left-Right Banded (LRB) topology is applied and recognition is achieved by Forward algorithm with an average recognition rate above 90% for isolated hand gestures. Because of the use of OpenCV's inbuilt functions, the system is easy to develop, its recognition rate is quite fast and so the system can be practically used for real-time applications.

B. Hand Gesture Detection and Recognition using Principal Component Analysis

A real time system, which includes detecting and tracking bare hands in a cluttered background using skin detection and hand postures contours comparison algorithm after face subtraction,and recognizing hand gestures using Principal Components

81. A Survey on Computational Approach for Disease-Gene Associations

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A Survey on Computational Approach for Disease-Gene Associations

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Abstract

Understanding the link between genetic diseases and also the genes associated with them could be a crucial problem for human health. The vast amount of data created from a large number of high-throughput experiments performed within the last few years has resulted in a huge growth in computational methods to handle the disease gene association problem. Nowadays, it's clear that a lot of genetic diseases do not seem to be the consequence of defects present in a single gene. Proteins present together in a community are represented using a PPI network graph. These PPI networks indicate how proteins interact. In this paper, a computational approach for the disease-gene association is devised using Genetic Algorithm and Protein-Protein Interaction Networks (PPI).

Index Terms : genetic disease, PPI network, gene

1. INTRODUCTION TO DISEASE-GENE ASSOCIATION PROBLEM

Associating genes with a specific group of phenotypes, i.e. the genetic diseases is one amongst the key of gene-phenotype association research. Associating genes with genetic diseases and disorders is crucial to recognize the genetic basis of human diseases. The specific research area problem where the genes which are in any way involved in the existence of a given genetic disease are identified is called the disease-gene association problem, or identification of disease genes, or disease gene prediction. Understanding the complex correlation between genes and proteins requires the processing of a vast amount of data from a wide variety of genomic data sources. Thus, computational tools have become critical for the integration, representation, and visualization of heterogeneous biomedical data. To be extremely general, computational disease-gene association methods apply all the possible and potential findings throughout years of research in related areas, using whatever useful information can be found in the literature to associate genes with diseases.

2. RELATED WORKS

INTEGRO: an algorithm for data-integration and disease-gene association

A INTEGRO[1] is an algorithm used for disease gene association and data integration based on the information retrieved from OMIM, NCBI-MedGen, SNOMED-CT, Disease Ontology and DisGeNET. A latest selected version of DisGeNET was used to ensure the reliability and validity of the information.

INTEGRO's pipeline was summarized by the following steps:

1. To establish the relation between the input and the information is annotated in DO to identify a defined term of interest in this the input is referred to as the word Term.
2. To extract attributes related to the Term for example cross-references and DO-id.
3. Then visit the DO's graph to identify the Term with the right attributes contained inside its relationships.
4. Then analyze the cross-references to retrieve external information by OMIM, NCBI-MedGen, SNOMED-CT, Disease Ontology and DisGeNET. And at last, the disease-gene associations and other information such as definition, UMLS codes and treatments are also integrated while excluding redundancies.

DO is a Directed Acyclic Graph which presents terms linked in the hierarchy and interrelated subtypes. In this attribute, "is_a" was used to identify the root node for a given term. In this DO's graph, the terms become more specific while the depth increases whereas the root nodes are therefore more generic. Here in this graph terms can have multiple values but the term with more similarity and greater depth is chosen discarding others.

82.A Survey to Build a Movie Recommender System Using Hybrid Filtering

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A Survey to Build a Movie Recommender System Using Hybrid Filtering

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Abstract:

Now a days, machine learning algorithms are playing a very important role recommender system. In this paper, we propose a survey to build a movie recommender system using Hybrid Filtering.

Keywords: Machine Learning Algorithms, Recommender System, Hybrid Filtering.

1. Introduction

In today's world, due to the continuous development of the internet technology, overload of the information has become a serious issue. Huge amount of data is being generated each hour. To get the information that we need, the search engines are useful up to some extent. But when we do not know what exactly we are looking for, they cannot provide the results which satisfy the user. The recommender systems help in regard to this problem by providing the user with the information based on his preferences, search patterns, etc. These help the user to find the information which is otherwise anonymous to him. Recommender systems are now playing a major role in various online applications like Amazon, YouTube, etc. During this survey we got to know how a recommender system works, what methods are used for the generation of the recommendations and we also have gone through some of the existing systems.

Recommender Systems

1. Filtering Techniques

Collaborative Filtering:

This filtering technique is totally based in the users' previous history, that is, the movies that he has already watched and rated are taken into consideration. Now these ratings are stored. Similarly we have the ratings given to the movies by thousands of users. Now for a particular user a set of similar users are found based on the similar movies that they have watched and how similar their ratings are. Simply put, the logic here is that if an User A and another User B like an item then the item that are liked by user A may also be liked by the user B and vice versa[1].

Content Based Filtering:

In this technique, the attributes of the movies such as their genre, cast etc. are used to find the similar movies. That is if the user watches a movie then based on this movie's attributes a list of similar movies is generated. This may include the movies that are of same genre or include one or more of the cast members. Since the attributes are being used, the recommendations that are generated maybe repetitive and limited in scope[2].

Hybrid Filtering:

To overcome the disadvantages of a single method, two or more methods are combined together which may result to generation of better recommendations. These

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Analysis of Human Traits Using Machine Learning

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Abstract: Personality is a parameter that makes one individual different from the other individual. Predicting personality has many applications in real world. The main objective of this paper is to take textual data as input from the user and then run the trained machine learning model on this data to predict his 4 personality traits which are Introversion vs Extroversion, Sensing vs Intuition, Thinking vs Feeling, Judging vs Perceiving. The main objective is to build an application where users can answer the questions which are processed and analyzed to output his personality traits. The output is a string of 4 characters where each character determines a personality trait, total of 16 personality types are possible. The Machine learning model XGboost is used to classify the text and output four personality traits. Processing of large textual data is to be done using Natural Language Processing (NLP) techniques with the help of nltk libraries to process and categorize the data. In order to increase the performance of the model hyper parameter tuning along with cross fold validation is done.

Keywords: *Logistic regression, Naive Bayes classifiers, XGBoost, Decision Tree*

1.INTRODUCTION

Personality is what distinguishes the people from one another so it is considered an important parameter. Personality is a key aspect of human life. The study of personality more specifically comes under the branch of psychological study. Personality is constituted of elements like a person's thoughts, feelings, behavior which continuously keeps on changing over time. The Prediction of personality is treated as a classification problem in computer science as the people are classified into the different classes of the personality types. There are a number of psychological tests that yield different types of personality classes. Popular tests include MBTI, Big Five, DISC. The Myers-Briggs Type Indicator (MBTI) is one of the most famous and widely used personality tests or descriptors. It describes the way people behave and interact with the world around them with four binary categories and 16 total types. They are as follows: Introversion vs Extroversion, Sensing vs Intuition, Thinking vs Feeling, Judging vs Perceiving.Understanding personality traits can be very useful as it helps users to discover why people behave in certain ways, the areas in which they can improve and also helps users in finding other people with similar personality traits.

2.LITERATUTE REVIEW

There is significant amount of work has been done in automated personality prediction among researchers in the Natural Language Processing and Social Science fields all over the world. Most of the studies done on personality prediction focused on the Big Five or MBTI personality models, which are the two widely used personality models in the world. The Big Five personality model can be explained as a set of five broad trait dimensions namely, extroversion, agreeableness, conscientiousness, neuroticism and openness. On the contrary, the Myers- Briggs Type Indicator classifies personality types in 16 ways via four dimensions, namely introversion vs extroversion, sensing vs intuition, thinking vs feeling, judging vs perceiving. Classic machine learning techniques and neural- networks have been widely used for predicting MBTI personality types.

One of the studies on personality prediction using machine learning could accurately predict a user's personality type based on MBTI personality type indicator and by considering the information presented on their Twitter. In another study the Naïve Bayes and Support Vector Machine (SVM) techniques were used to predict an individual's personality type based on their word choice. SVM performed better among all these methods. The same database used in previous research, the Myers-Briggs Personality Type Dataset from Kaggle. classification techniques such as logistic regression, Naïve Bayes, Random Forest, K Nearest Neighbour (KNN), Linear Discriminant Analysis (LDA) and Support Vector Machine (SVM) have all been used for personality type prediction based on the MBTI Gradient Boosting is a machine learning technique that has achieved considerable success in a wide range of practical applications because it is highly customizable to the particular needs of the application.

84.Prediction of Phishing Website For Data Security Using Various Machine Learning Algorithms

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PREDICTION OF PHISHING WEBSITE FOR DATA SECURITY USING VARIOUS MACHINE LEARNING ALGORITHMS

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Abstract: Phishing is one in all the foremost threats during this net era. Phishing may be a sensible method wherever a legitimate web site is cloned and victim's area unit lured to the pretend web site to supply their personal yet as counselling, typically it proves to be expensive. Although most of the websites can provide a disclaimer warning to the users concerning phishing, users tend to neglect it. It is not a totally accountable action by the websites additionally and there is not a lot of that the websites might very do concerning it. Since phishing has been in persistence for an extended time, several approaches are projected in past which will find phishing websites however only a few or none of them find the target websites for these phishing attacks, accurately.

Our projected methodology tends to establish phishing websites employing a combined approach by constructing Resource Description Framework (RDF) models and mistreatment ensemble learning algorithms for the classification of internet sites. Our approach uses supervised learning techniques to coach our system. As our system explores the strength of RDF and ensemble learning ways and each these approaches work hand in hand, an extremely promising accuracy rate of 97% is achieved.

Index Terms **– Phishing, Logistic Regression, Support Vector Machine, Decision Tree, Random Forest, XGBoost Classifier**

Introduction

Phishing attack is a typical way of attack or fraud in which an attacker tries to learn sensitive information or data such as login or sign in credentials or account information by sending as a well-known entity or person in email or other communication channels. Typically, a victim or person receives an email or a message that appears to possess been sent by a known contact or organization. The message contains harmful software targeting the user's computer or has links to direct victims to malicious websites in order to trick them into communicating personal and financial information, such as passwords, account IDs or master-card details. Phishing is popular among attackers, since it's very easier to trick someone into clicking a malicious link which seems legitimate than trying to interrupt through a computer's defense systems. These malicious links that are present within the body of the message are designed to make it appear that they go to the send up organization using that organization's logos and other legitimate contents. Many users without their knowledge click these phishing domain links every day and every hour. The attackers are targeting both the companies and the users. According to the MCSIR, released in February 2014, the annual worldwide impact of phishing could be very high as $5 billion. The main reason behind this is the lack of awareness of users. Security defenders must be responsible to take precautions to prevent users from confronting these harmful sites. Preventing these type of attack huge costs can start with making people conscious in addition to build strong security mechanisms which are able to detect and prevent these phishing domains from reaching the user. One of the common victims of these attacks are users of social media network sites. With the huge rise in the internet, the risk associated with phishing attack will also increase and criminals will always try to find new ways to deceive people. As phishing evolves, stakeholders will always find new ways of mitigating the risk associated with phishing.

85.IoT based Air Pollution Monitoring System

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IoT based Air Pollution Monitoring System

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ABSTRACT: Air pollution has become one of the major problems in the world getting fresh air has become very difficult. In India alone, we have more than 230 million vehicle's which emit many pollutants which damage our nature. Without knowing anything weather the air is polluted or not, we breathe over 11 gallons of air each day. This proposes a cloud-based air quality detection system that analyses the data for providing atmospheric quality to the user in real-time. There are commercial meters available in the market like Fluke CO-220 carbon monoxide meter for CO Amprobe CO2 meter for Co2 and many others. That's why in this project we are going to make an IOT based Air pollution Monitoring System which will monitor Air Quality over a web server using the internet and will provide the quality of air in ppm and display it on LCD. It also helps to detect the harmful gases in the air like CO2, smoke, alcohol, benzene, and NH3. We will use data mining algorithms to calculate the result so that we can analyze the changing in quality/quantity of air in the atmosphere.

Keywords:

I.INTRODUCTION

The air pollution in major cities may reduce life expectancy by up to 22 months. However, according to a study that was made by the World Health Organization (WHO) in May 2016 and updated in 2018, most big cities are facing this issue. More than 80% of urban areas reach air pollution levels well above acceptable values "around seven million people die every year from exposure to fine particles in polluted air that lead to diseases such as stroke, heart disease, lung cancer ... and respiratory infections". The World Health Organization provides an interactive map based on estimate models, which considers fine particulate matter (PM2.5) in micrograms/cube meter.

The main Objective of the work is As stated previously, the main objective of this project is to analyse various data sets of air pollution which has been collected from different cities and states and provide a complete analysis of how the pollution rate is increasing daily and the steps that has to take to reducing the increase of the pollution. The other objective of this project is to increase the awareness among the people that how much pollution is caused daily.

It is to provide a proper air pollution air monitoring device that is cheap in cost. As the pollution around is changing drastically everyday, it is duty of everyone to monitor this changes and take appropriate action which are required to maintain the eco balance in the nature. This device gives the necessary information about the pollutants in the air and shows them the analysis of those gases in the air. The parameters that are considered are the gases which causes most damage to the nature.

II .LITERATURE SURVEY

The IOT based air pollution monitoring is a hardware project. In this section, we shall look into the core design of the program. The fundamental components of this program are the data analysis module's visual. The Raspberry pi 3B+ is used, with different sensors connected to it. The system needs to collect data through the different sensors for a particular locality to monitor the air pollution. The design involves both hardware and software components. The parameters of ozone, particulate matter (PM), Carbon dioxide (CO2), Carbon monoxide (CO), gas, temperature and humidity are taken into consideration. The sensors of the MQ series are used, i.e., MQ131, MQ-7, MQ-2, MQ-9, MQ-135. In addition to these, DSM-501A, DHT-11 is used for measuring Particulate matter and temperature & humidity respectively. These sensors are connected with the Raspberry pi 3B+, then analysed by Python language, and then displayed on a monitor to understand the air quality of a particular locality. The proposed system provides low cost, low power, compact in nature and highly accurate system for monitoring the various parameters of the environment. Matplotlib and Dash are Python's packages, that allows the programmer to build data visualization components and make analysis . Though they aren't the only libraries used, they cover majority of the project, and is kept regularly updated by the Python community. It offers various graph formats and analysis models to get the output that we desire. There are commercial meters available in the market like which are high in cost and most of them just give the basic ppm level and most of the devices doesn't give an complete analysis to the user, some of the existing devices are like Fluke CO-220 carbon monoxide meter for CO. The other devices are Amp robe CO2 meter for Co2.

Air quality data was collected using the MQ135 sensor. The calibrated sensor made the analog output voltage proportional to the concentration of polluting gases in Parts per Million (ppm). The data is first displayed on the LCD screen and then sent to the Wi-Fi module. The Wi-Fi module transfers the measured data valve to the server via internet. The Wi-Fi module is configured to transfer measured data an application on a remote server called "Thing speak". The online application provides global access to measured data via any device that has internet connection

86.Crop Prediction System using Internet of Things (IOT) and Cloud Computing

Crop Prediction System using Internet of Things (IoT) and Cloud Computing

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ABSTRACT

In a developing country like India, agriculture is not only a profession but a way of life. Agriculture contributes to 17-18% of India's GDP. Ever since the Green Revolution, the world has witnessed a major development in production and the techniques that were deployed were highly modernized there by leading to extensive farming. For a crop to be productive, a number of factors need to be considered. The irrigation facilities, the soil type, the micronutrients available in the soil, and the crop we cultivate play a major role in deciding the yield of the crop. Crop Selection has the capability to optimize the potency of the field to the maximum.

The Internet of Things has the potential to transfigure the approaches we employ in quotidian tasks. With the IoT, we're headed to a world where things aren't liable to break catastrophically- or at least, we'll have a hell of a heads' up. Integration of the IoT and Cloud computing technologies will revolutionize the supply chain. The IoT is set to push the future of farming to the next level. Smart agriculture is already becoming more commonplace among farmers, and high-tech farming is quickly becoming the standard thanks to agricultural sensors. In this project, using IoT devices and cloud computing technologies, we intend to peruse the field and conclude to the farm owner and adhere him to the farm by the provision of continuous monitoring information through the cloud

1. INTRODUCTION

Agricultural sector plays a strategic role in the process of economic development of a country. It has already made a significant contribution to the economic property of advanced countries and its role in the economic development of less developed countries is of vital importance. The agriculture sector is the backbone of an economy which provides the basic ingredients to mankind and new raw material for industrialization. IoT, a sensation in the modern-day technology, has a major impact on the rapidly growing technological aspects. The Internet of Things is a network of physical things with built-in sensors, software, and other technologies for the purpose of connecting & integrating data with other devices and systems over the internet. It's making people's life easier and enabling us to do things that were previously seen as miracles. From smart appliances to smart security, smart meters to smart city technologies,

IoT is revolutionizing the way the world works. We are in a hyper connected world where things connect with each other with their "smartness" and make life easy for us. It helps in solving many complex real-time problems. One such major applications in the field of agriculture can turn out to be productive and profitable. This paper presents the application of various techniques infusing IoT in agriculture that helps in productive and predictive results in that field, thereby leading towards precision agriculture. A low-cost power supply and definitive farming system using IOT with the cloud computing platform. IoT is an intelligent technology which includes identification, sensing and intelligence. Life and even intelligence of life itself can also be regarded as part of IoT technology. It is used in pattern identification fields like measurement and computing as well as computer and communication fields like sensing, communication, information collection and processing. The definition of IoT changes as the time of cloud computing comes. It is now defined as " IoT=cloud computing + ubiquitous network + intelligent sensing network". Cloud computing management platform is the "brain" of cloud computing and relevant data. It involves management of accession of cloud computing customization application by users of this IoT, computing and processing what is involved in customization service, organizing and coordinating service nodes in the data center. IoT is a technology which aims to extend internet to large number of distributed devices by defining standard, interoperable communication protocols". Smart farming and precision agriculture involve the integration of advanced technologies into existing farming practices in order to increase

87.Text Character Recognition Using Extraction Tools

Text Character Recognition Using Extraction Tools

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ABSTRACT: Text Recognition system defines the process of mechanically or electronically converting scanned images of handwritten, typed or printed text to machine-encoded text. In general we store text in the form of PDFs or documents which cannot be further edited or modified. Instead of taking pictures of any useful data this concept helps to scan the document and stores it as text so that it can be further edited. The three major steps involved in optical character recognition are:1) Image Preprocessing 2) Character Recognition 3) Post Processing of the output. After performing the above three steps we get text .Getting text with 100% accuracy is a big challenge .This Project is done using android , where the mobile app can be used for scanning images and storing them in database , so that they can be used for reading or editing later. This project will consider all the aspects in order to solve the problem and reach maximum efficiency possible by implementing/developing one or more techniques.

1. Introduction

Text character recognition commonly deals with the recognition of optically processed characters and is also known as optical character recognition (OCR).The basic idea of text character recognition system is to convert any hand written or printed text into data files that can be edited and read by machine. With this system,any article or book can be scanned directly and the image can then be easily converted to text using a computer. The OCR system has two major advantages, which are the ability to increase productivity by reducing staff involvement and the ability to store text efficiently. Generally,the areas where this system can be applied are postal departments, banks, publication industry,government agencies, education, finance and health care. The universal text character recognition system consists of three main steps which are image acquisition and preprocessing,feature extraction and classification. Image preprocessing phase cleans up & enhances the image by noise removal,correction,binarization,dilation,color adjustment and text segmentation. Feature extraction is to extract and capture information from the acquired text image to be used for classification. In the classification phase, the portion of the segmented text in the document image is mapped to the equivalent textual representation.

2. LITERATURE SURVEY

The basic idea of developing an optical character recognition model came into existence from the fact that noting down the content which is present in the form of an image or pdf requires a lot of human effort. In order to reduce that effort, many engineers have come up with the different ideas of developing the application. Any application of an OCR model consists of three main steps i.e., the preprocessing of an image which means removing the noise from the image and enhancing it by using several techniques, the training of the model with the given dataset using neural networks like convolution neural networks and the testing of the model with the new dataset. In the below sections, we look at the different solutions proposed by different authors to develop the model.

In the paper [1] the authors proposed a model for handwritten character recognition using Structural components extraction method in which the characters are represented in the form of a planar graph. Then the vertices of planar graph can be used as the key points of character image and the edges as sets of pixels that connect key points on the character image. In the paper [2] the authors proposed another model for extraction of text from an image using KNN on custom image dataset. The algorithmic steps of this model are, initially, the training image having the set of characters in different format is read and processed. Training image is converted into a grey-scale, blurred, threshold and flattened image so that it is easier for the system to understand the image features and differentiate between the objects(characters) and unwanted background. From the contours with data, features are extracted for each character and stored in a numpy array. Then this array and an array containing labels are combined and stored in a text file. The second module is for training and testing. The saved text files are loaded. Then a KNN classifier object is created using cv2, which is trained using the text file. Now the image to be tested is read and again the image is converted and processed to extract the features from the contours with data. Then the contours with valid data is checked and separately stored in a list. These contours are marked with green

88.A Survey On Using Swarm Intelligence Algorithms On the Data Collected From IOT-capturing EEG Signals

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A survey on using swarm intelligence algorithms on the data collected from IoT- capturing EEG signals.

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Abstract: Few years ago it was a fantasy or a science fiction, to control the working of real world devices with thoughts. But now it has become a reality, thanks to Brain Computer Interface (BCI). BCI based on scalp electroencephalogram (EEG) signals is a non-invasive technique that is the major and economical mode of data acquisition from brain. Other forms of non-invasive brain data acquisition are Magneto encephalography (MEG), Functional magnetic resonance imaging (fMRI), Functional near-infrared spectroscopy (fNRIS). BCI can be applied to plethora of varied applications from both medical and non-medical fields. In medical field, it can be applied in prevention, detection and diagnosis, rehabilitation and restoration. In non medical field it can be applied in neuroergonomics, smart environment, gaming applications etc. BCI is a direct communication pathway between a human or animal brain and an external device. With BCI, a person with all kinds of disabilities but having a functioning brain can do anything to everything. As brain is the most complex organ of the human body, the data acquired from the brain will also exhibit complex features. To analyze these features we have to use efficient and competent algorithms. Algorithms working on the concept of collective intelligence are found to perform better in the anlaysis of EEG signals. There are numerous Swarm intelligence (SI) algorithms like Ant colony optimisation(ACO), Particle swarm optimisation(PSO), Bee colony optimization (BCO) that harness the collective intelligence. Here we endeavour to present the survey on the usage of swarm intelligence algorithms on the EEG data collected from the IoT device.

Keywords: Neuroergonomics, Electroencephalogram (EEG), Magneto encephalography (MEG), Functional magnetic resonance imaging (fMRI), Functional near-infrared spectroscopy (fNRIS), Ant colony optimization (ACO), Particle swarm optimization(PSO), Bee colony optimization (BCO), Swarm Intelligence (SI).

1. INTRODUCTION

Today, the real world is filled with innumerable IoTs which we can see all around us. With time, the increase in the number of IoT devices would be very high. IoT is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and has the ability to transfer data over the network. Though individually IoT is a trending technology but along with it comes many challenges. The data collected from the various IoT devices are varied in nature depending upon the type of the device, the parameters or the features considered, noise in the environment while capturing the data , type of the signals considered like digital or analog etc. These things make the analysis of IoT data a complex task. The EEG data collected from the brain also exhibits these features. Researchers have found that to analyze complex data, algorithms working on the concept of collective intelligence perform better. This collective intelligence can be captured by harnessing the collective behavior exhibited by some of the natural systems like colony of ants, flock of birds, shoal of fish, swarm of bees etc. Intelligence can emerge from social interaction. Swarm intelligence is a relatively new subfield of artificial intelligence which studies the emergent collective

89.Leaching Estimation for Paddy Crop using IoT and Machine Learning

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Leaching Estimation for Paddy Crop using IoT and Machine Learning

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Abstract*— Soil salinity is a major issue in farming faced by many farmers across the globe. So it is very much important to identify the salinity level of the soil. Internet of Things (IoT) assisted solution is proposed to determine Electric Conductivity, temperature, and Moisture level at the root zone of the crop field. Internet of Things (IoT) and Machine Learning (ML), based leaching water requirements estimation for saline soils is made using the onsite monitoring of the salinity level and crop field temperature and crop growth stage. Food and Agricultural Organization (FAO) proposed method of leaching requirement is implemented for efficient leaching water estimation. These parameters are used to train and test the Machine learning model to predict the leaching requirement. The performance of machine learning is measured in terms of accuracy.

Keywords*— Soil Salinity, Leaching, IoT, ML, Electric Conductivity

I. INTRODUCTION

Soil salinity is the gradual gathering of salt in the soil due to poor water quality and irrigation practices. Soil salinity is measured in terms of electric conductivity. This indirectly affects the yield of the crop, to reduce this salinity we use a method called leaching. Leaching is a process of providing a sufficient amount of water to the crops so that the salt in the soil will be dissolved in this water and the salinity level will be reduced. Estimating the amount of leaching is a very important factor. Along with soil salinity temperature and soil moisture and the growth stage of the crop plays a very important role in finding the leaching for that particular soil. So we use the Internet of Things to find out these parameters using various sensors.

Most of the irrigation water is being wasted due to improper knowledge on soil salinity as the salinity value is unknown the farmer couldn't able to find the accurate leaching for the crop.

II. LITERATURE SURVEY

There are many methods to find soil salinity few of them are soil laboratory testing, Remote sensing, ground survey. Soil library testing is the common method used by the farmers to find out the salinity level. The laboratory collects soil samples and finds the salinity level in the laboratory. This method is time-consuming and costlier. There are different ways to detect, monitor, and map soil salinity. The most important are laboratory analysis, ground surveys, proximal sensing, remote sensing, Unmanned Aerial Vehicle (UAV) assisted Ariel photography. All of these approaches have their pros and cons. Laboratory tests are a valid and proven method for mapping soil salinity. Many irrigation automation systems were proposed, but not a single solution targets the saline soil. Not a single IoT assisted precision irrigation study was conducted using in-situ monitoring of field parameters related to salinity and applied the machine learning approach to predict such recommendation in the futures based on microenvironment data

III.PROPOSED SYSTEM

A. Internet of ThingsModule

In the IoT module, we have three important sensors electric conductivity sensor soil moisture sensor, and temperature sensor. An electric conductivity sensor is used to find the salinity level in the soil more the value of EC the salt in the soil and vice versa. A soil moisture sensor is used to find the moisture in the soil which helps in finding the leaching. The temperature sensor is used to find the temperature near the cross-field all these three sensors are incorporated near the crop and all the sensors are connected to the database so the sensor values will be updated after every particular interval to the database.

B. User Interface Module

It is very much important to do to have an interface for the farmer to view the live values of the sensors and to find the leaching, a mobile application will be developed for both admin and farmer. Admin can create a farmer account and he can view the existing accounts and also view the sensors which are currently active and so on. Farmer can view the live sensor values in the mobile application these values are retrieved from the database the farmer will be provided with a reaching calculus button where he can find the leaching required by providing the growing stage of the crop.

90.Cloud Based Point of Sale System with Face Recognition

Cloud Based Point of Sale System with Face Recognition

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Abstract : A Point of Sale (POS) is an electronic banking outlet that enables customers to complete the basic financial transactions using debit or credit cards without the aid of bank representative or teller. It is an electronic banking outlet that enables customers to complete the basic financial transactions using debit or credit cards without the aid of bank representative or teller. The Traditional POS system runs on closed networks and the user data is stored on local servers. They need to be updated manually on-site. POS systems generally accept credit and debit cards to process bills. It is found that there is increase in levels of fraud among the users of credit and debit card. So there is a requirement to build a system that can store the data securely and also do the transactions without giving scope to any fraudulent activities. For the effective and efficient operations of security systems, accurate and automatic recognition of persons is becoming increasingly important. As a solution our proposed system "Cloud Based POS System with Face Recognition and Password with Cloud implementation" is proposed as a method of payment making POS systems both card less and cashless. FaceNet which was proposed by Google Researchers was used for implementing face verification and recognition, along with password verification as a two-step authentication. We use FaceNet and Multi-Task Cascaded Convolutional Neural Network, for detection and identification of faces. This POS system will do more, than just accepting payments. Here we also try to Integrate Cloud Computing (CC) with the system which makes it more secure. The combination of POS system with Cloud Computing will make our new system more reliable and faster. It is studied that this technique is not very expensive and it gives us an accuracy rate of about 96.75%.

***Index Terms* –, POS, Cloud Computing, FaceNet, MTCNN , Face Recognition.**

I. INTRODUCTION

A point-of-sale system, or POS, is the place where a customer makes a payment for product or services at a store. Simply put, every time a customer makes a purchase at a store, they are completing a point-of-sale transaction. It is a combination of hardware and software and used primarily by a business to process customer purchases.

POS systems generally accept cash, credit and debit cards to process bills. In recent times in credit card transactions many fraud and security issues are present. Cryptographic keys were fetched and are utilized to achieve privileged access and sensitive information of card holders are stolen. Also, credit card thefts are becoming quite common. It is found that there is increase in levels of fraud among the users of credit and debit card. Information is being stolen by the hackers and used to make fraud transaction. It has been seen that the card information gets stored in POS s.In order to decrease the crime happening in massive level a protection profile for Point of Sales System, there is need to enhance the security of the users. Now there exists no Point-of-Sale system that gives full security to the users. Thus, a Point-of-Sale System with an innovative feature such as secure payment gateway by two step authentication, i.e. face recognition using FaceNet and password verification, that make forecasts at a real store considering the real time data specific to the domain and at the same time providing users security with the credit card data is needed, to improve the current models.

II. LITERATURE SURVEY

There are many existing solutions available for the secure payment at the payment gateway. The incorporation of fingerprint biometric recognition as an additional layer of protection to the customary pin and password requirements to gain permission to pay for goods purchased and services rendered using point of sale device can guarantee the secured transaction[11]. But it is possible that our fingerprints can be identified from public photographs that show our hands. Therefore, fingerprint scanning can't guarantee the secured transactions. And hence, Iris scan was introduced at the authentication level of the existing POS machine[12]. The experimental results shows that the system could significantly minimize cardholder fraud at the POS machine but not at a high rate. Currently, face recognition is used as a technology to provide multiple security in various practices likes verification of identity, access authority, observation, to replace passwords and identity cards that are no longer safe. The use of face recognition has the benefit of verifying personal data because, inhumin faces things like irises, retinas, faces are very unique to each other. For the effective and efficient operations of security systems, accurate and automatic recognition of persons is becoming increasingly important.

Face recognition, is one branch of computer science, is an ability to recognize or identify the person's identity by analysing the pattern-based facial contours of human faces. Face recognition has many methods in its application today. For example, Haar Cascade[5], Principal Component Analysis (PCA)[3]; Linear Discriminant Analysis (LDA)[6], and Deep Learning[4][2]. Haar feature is a wavelet-based feature that decomposes image. The principle of the process is, the parameter of the image is detected whether it has face characteristic or not. If it has the separation stage of face and background, the image will be processed for further classification. The formula of Haar feature is, the average value of the result is above the threshold, it means the Haar feature exists. The closer the value to 1, the more likely we have found the face. Haar cascade face detection can detect images at different scales. But the major drawback is that it gives false results as well as it doesn't work on non-frontal images[5].

91.. A Novel Alarm System Approach using IoT for Safe Guarding Trees in Forests and Farm Lands

A Novel Alarm System Approach using IoT for Safe Guarding Trees in Forests and Farm Lands

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Abstract

The main objective of this paper is to develop cost-effective framework for the safe surveillance of forests and farmlands and to monitor & prevent Stealth Activities happening in Forest and Farm Lands. A notable cause for concern was theft of trees such as Teak, Sandal-wood and Sagwan. This is also a snap in the plants and animals of the woods. As people, we acknowledge that by adopting the latest measure, we are combating these stealth activities. These forests on the earth are excessive and less available. It may be used in treatment and beauty products as well. With the gigantic aspect of the money involved with the provision of such woods, stacks of occurrences are being cut and sneaked. Several strategic measures should be made to access these allocations to safeguard the woods area. We end up with such a framework that can be used to hold the lead.

Keywords : Forest, Farm Lands, Stealth Activities, Earth, Less Available, Framework

1. Introduction

For centuries we were troubled by unlawful acts like poaching precious trees from the guarded wooded areas along with Sandal-wood, Teakwood, or Sagwan. Woods from such trees are quite costly and have huge demand in present wood market. The forests usually are regarded to be safeguarded by manually identifying such tags because they can be impaired by anybody. Even periodically caused disasters could well harm forests.

In One approach, an unmanned Intelligent device had been developed so as to solve this kind of problems. These modules are offered by the pairing of the latest devices as well as integrated alternatives such as embedded IoT systems. The unit is designed to function in a given area, and it will be composed of dual units: 1) Server-unit 2) Tree Unit[1].

In another approach, one small device unit with Embedded Internet of Things(IoT) system such as General Packet Radio Service(GPRS), Sensors, Solar-power panel and a micro-controller has to be mounted for each tree. The proximity between sides trees will be transmitted to the present

92.Internet of things apply key applications in agriculture sector

Internet of Things apply key applications in Agriculture sector

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Abstract
In present days world population is increased day by day. So providing food and other things like cloths very difficult in world unfortunately suitable land for agriculture also very less. actual India economy is most depends on agriculture field but present scenario the farmers not enjoyed the fruit of farming due to various reasons like different types of soils, weather conditions, lake of water, plant disease, insects attacks, labor cost, applying essential supplements like applying pesticides and herbicides , marketing various other different obstacle. So reduce all these obstacle and make farming more profitable so farmers need technological advancement that is called "Smart agriculture". In this involved Internet of things for improving agriculture yield. In this paper i mentioned some important areas where Internet of things is useful for improving agriculture yield.

Key terms: Internet of Things, Smart agriculture

Introduction:

In world community rate is increase day by day according to prediction figures in 2050 the world population is reach 9.8 billion, current rate increase roughly 25% . In this improve the agricultural field because developing countries food demand increase so all people more care about their diet and food quality so food production should be increased by 2050.

Agriculture is backbone of our nation because many income come with agriculture in this scenario food production will increase not only food production crop production because some crops like Gum, Cotton etc., are important role in the economics of many nations.

In India not all places are supported agriculture only limited portion of the earth is suitable for agriculture various reasons like climate, temperature, and soil quality so what are available land in that only increase production.

In 1991, the total area for food production was 19.5 million square miles out of 39.47% worlds land area which was reduced to approximately 18.6 million square miles in 2013. So fill this gap between demand and supply of food is becoming more important and alarming with the passage of time.[1]

In agriculture field every field has different characteristics that can be measured separately in terms of both quantity and quality. Some critical characterstics like soil type, nutrient presence flow of irrigation pest resistance etc., define its suitability and capability for a specific crop.

Some farmers have less land but they consider all these problems so they did not reach these demands that are way farmers need new methods to produce more yield.

In traditional methods throughout the crop life cycle farmers need to visit frequently in agriculture field so they maximum time spent monitoring and status of crop instead of actual field work doing. For this smart agriculture they need.

Recently many emerging technologies are coming in this Internet of Thing is impact on different areas like industries, health centers, communications, manufacturing, academics, agriculture etc., in agriculture many applications in IoT system like irrigation, crop monitoring [3] In order to increase yield internet of things is vital play role in agriculture.

Literature

IoT based techniques like CROP WATER STRESS INDEX(CWSI) based irrigation management.

A wireless sensor based monitoring system where all the field sensors are connected to collect the mentioned measurements further transmitted to processing center where all the field sensors are connected to collect the

93.Alerting systems for drivers

Alerting system for Drivers

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ABSTRACT:

India is a vast country which is highly populated with people and also with vehicles. This made accidents more prevalent in our country. According to National Crime Records Bureau (NCRB) 2016 report about 4,96,762 accidents happened in India , of these 4,64,674 were road accidents. The main reason for road accidents as mentioned above was the negligence of drivers .The drowsy and drunken drivers are the major cause for accidents. In-order to reduce this problem in our country, we are making a software product. Our application uses the laptop's front camera to monitor the driver. Whenever he feels drowsy or if he is driving after consuming alcohol our application detects it by his facial expression and immediately alerts the driver. This alerting is done either by using a pre-recorded human voice or through vibrators fixed on driver seat belt. Our application also alerts the driver regarding the accident prone areas. It uses the devices GPS (Global Positioning system) location and alerts the driver if he is near/ entering an accident prone area.

Key terms: Alert system, Global positioning system.

1. INTRODUCTION

Main objective is due to the increase in the amount of automobile in recent years, problems created by accidents have become more complex as well. Traditional transportation system is no longer sufficient. In recent years, the intelligent vehicle system has emerged and became a popular topic among transportation researchers. However, the research of safety in vehicle is an important subset of intelligent vehicle system research. Meantime, active warning system is one of the designs on active safety system. The safety warning systems, mostly active warning systems for preventing traffic accidents have been attracting much public attention.

Safe driving is a major concern of societies all over the world. Thousands of people are killed, or seriously injured due to drivers falling asleep at the wheels each year. Recent studies show those drivers' drowsiness accounts for up to 20% of serious or fatal accidents on motorways and monotonous roads, which impair the drivers' judgment and their ability of controlling vehicles. Therefore, it is essential to develop a real-time safety system for drowsiness- related road accident prevention. Many methods have been developed and some of them are currently being used for detecting the driver's drowsiness, including the measurements of physiological features like EEG, heart rate and pulse rate, eyelid movement, gaze, head movement and behavior of the vehicle, such as lane deviations and steering movements. Among those different technologies, ocular measures, such as eye-blinking and eyelid closure, are considered as promising ways for monitoring alertness. main aim of this problem statement is a vehicle driver drowsiness warning system using image processing technique with neural network is proposed. The proposed system is based on facial images analysis for warning the driver of drowsiness or inattention to prevent traffic accidents. The facial images of driver are taken by a video camera which is installed on the dashboard in front of the driver. A Neural network based algorithm is proposed to determine the level of fatigue by measuring the eye opening and closing, and warns the driver accordingly. The results indicated that the proposed expert system is effective for increasing safety in driving.

In Existing System To analyze driver's drowsiness several systems have been built. They usually require simplifying the problem to work partially or under special environments. for example D. Taneral et al. presents an automatic drowsy driver monitoring and accident prevention system that is based on monitoring the changes in the eye blink duration. He proposed the method that detects visual changes in eye locations using the proposed horizontal symmetry feature of the eyes. This new method detects eye blinks via a standard webcam in real-time at 110fps for a 320×240 resolution. Flores Javier macro et al has presented a new Advanced Driver Assistance System (ADAS) for automatic driver's

94.Cold Storage Monitoring System During Supply Chain

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COLD STORAGE MONITORING SYSTEM DURING SUPPLY CHAIN

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Abstract: Everyday food stuff are stored and transported using cold storage trucks, ships, etc. Many foods like raw meat and fish are very sensitive, which may require more care. Air quality plays an important role for storage of food, if air is humid it leads to drying of food and further increase in humidity may cause bacterial growth, warm weather will accelerate this process. To overcome all these effects, we are developing the prototype which aims to reduce food wastage, increase shelf life of food and helps us to save energy. The system we are proposing is based on IOT. This prototype provides us real time monitoring of temperature and various other factors which may affect the food throughout the supply chain using various sensors. Components used to build this prototype are NodeMCU, Oled Screen, DHT11 Sensor, Buzzer, Bread Board, connecting wires, Firebase, Ardino application. We will be using MIT app inventor to make an application for admin to monitor the state of food from remote place.

Keywords: Cold Storage,IOT Devices, Cold Storage

1. INTRODUCTION

The cold chain is responsible for the preservation and transportation of perishable foods in the proper temperature range to slow biological decay processes and deliver safe and high-quality foods to consumers. The efficiency of the cold chain is often less than ideal, as temperature abuses above or below the optimal product-specific temperature range occur frequently. We aim to develop a solution to monitor the temperature & humidity inside the small containers throughout the supply chain transfer the information to remote stations along with timestamp, location data. We have used IoT devices i.e. Nodemcu as development prototype kit, oled screen for driver display, bread board and connecting wires for connection, DHT11 sensor for detection of heat and temperature. Besides this we use Aurdino for programming Nodemcu, Google firebase as our cloud storage and MIT App Inventor for building a mobile application.

95.Iot Based Smart Book Reader For Visually Challenged

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IOT BASED SMART BOOK READER FOR VISUALLY CHALLANGED

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Abstract: *In the real world, books and documents are the sources of knowledge. But this knowledge is only bounded to people with clear vision. Our society includes a group of people who does not have a clear vision or people who are blind. For this group, world is like a black illusion. The shape and structure's information of an object is unavailable to them let alone reading a document. For blind acquiring knowledge by reading documents is cumbersome. Braille is one of the methods which are used to read a book or document. In this method, any document has to be converted to Braille format to become understandable to a blind. The problem arises due to the fact that, this is an expensive procedure and many times not available. The solution is rather simple; introduce a smart device with a multimodal system that can convert any document to the interpreted form to a blind. A blind can read document only by tapping words which is then audibly presented through text to speech engine. "Blind Reader" - developed for touch devices which is user friendly and effective interactive system for visionless or low vision people. This paper proposes implementation of an Optical Character Recognition (OCR) based smart book reader for the visually challenged. There is a need for a portable text reader that is affordable, portable and readily available to the community. This paper propose a camera based framework integrated with Image processing algorithms, OCR and Text-to-Speech (TTS) synthesis module. The camera module is used to capture an image of the printed text, and the image is then subject to pre-processing before being fed into the OCR. The pre-processing stage includes binarization, de-noising, deskewing, segmentation and feature extraction. This paper addresses the integration of a complete Text Read-out system designed for the visually challenged.*

Keywords: ***Image processing, Optical character recognition, Pattern recognition, Binarization.***

96.Accounting and Privacy Preserving of Data Owner in Cloud Storage

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Accounting and Privacy Preserving of Data Owner in Cloud Storage

A. Mohan, P. Vamshikrishna

Abstract: ***People use the support of distributed computing however can't completely believe the cloud suppliers to have protection and confidential information. To guarantee secrecy, data owners relocate encoded information rather than plain texts. To divide the encoded documents with different clients, Ciphertext-Policy Attribute-based Encryption (CP-ABE) can be utilized. But this cannot become secure against some other assaults. Many other schemes did not gave guarantee that the cloud provider has the power to check whether a downloader can unscramble or not. Consequently, these files are accessible to everybody who is approachable to the cloud storage. An intentionally harmful assailant can download a great many records to start Economic Denial of Sustainability (EDoS) attacks, it will to a great extent expend the cloud asset. The owner will bear all the expenses for the cloud storage but the cloud provider doesn't provide the whole information about the access or usage. There is no transparency for the owner. We have to solve these concerns. In order to this we are going to propose a solution for securing the encrypted data from EDoS attacks and providing the owner whole usage information about the cloud storage. We are implementing by using the arbitrary access policy of CP-ABE.***

Keywords: ***Access control, cloud storage, privacy-preserving***

I. INTRODUCTION

Cloud computing allows us in such a way we can approach the applications in the internet. It permits us to make, arrange, and task the business applications in online. Cloud storage is a model in which data is kept on remote servers accessed from the internet. Cloud computing is the term for the since quite a while ago imagined vision of figuring as the state of being useful. By the increasing demand of the cloud based data services, data owners are influenced to store their huge amount of personal multimedia data files and tasks into remote cloud servers in a way they can protect their data.by using the plentiful capacity and calculation assets for cost minimization and adaptability, the redistributing of information stockpiling and calculation to the cloud raises security and protection problems. Cloud storage has benefits, such as available or operating at all times, a system in which you pay for as service before you use it and cheap. During these years, maximum amount of information are moved operations to public cloud for it's persistence counting private and professional files which brings a trust issue to data owners by which the public cloud isn't trusted, and the information ought not be spilled to the cloud supplier without acceptance from data owners. They largely trust the cloud supplier to shield their touchy information. The cloud suppliers and their Laboure's can peruse any archive despite of the prevailing circumstances of data owner's access policy. The cloud provider can make something larger than the actual resource usage of the document stockpiling and ask the payers more cash without giving exact records, since cloud do not have a framework for obvious count of the asset utilized. Data owners who keep files on cloud servers would like to maintain the access on their own hands and keep the information mystery against the cloud and harmful usage. Encryption is not only sufficient. For the confidentiality purpose information proprietors can scramble the records by which they can put an entrance strategy with the goal that lone approved clients can unscramble the report. Cloud services are usually supplied by some large enterprises like Google, Amazon, Microsoft. They have to maintain better reputation and trust from cloud storage services to their consumers. For organizing a fine-grained information proprietor side access control openly distributed mechanism storage, attribute-based encryption is used. From various ABE schemes CP-ABE is concerned in public cloud storage, in which cipher text is encrypted in an entrance strategy and just clients whose credits fulfill the entrance strategy can only have the permission to decrypt the cipher text. The cryptography method driven does not guarantee the cloud provider against several other attacks. So if the cloud supplier doesn't ensure the entrance control, it can't control the unapproved clients. One form of attack that is begun by this limitation is Distributed Denial of Services. Attribute based encryption is a cryptographic technique. In this technique different attributes are used for the encryption purposes. In CP-ABE scheme, the cipher text encrypts message with the help of access structure while an unscrambling key is related with a lot of traits. The decoding condition is rises to if and just if the characteristic set satisfies the recommended admittance structure [1].

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97.TO FORECAST HOSPITAL ADMISSIONS FROM THE EMERGENCY DEPARTMENT USING DATA MINING TECHNIQUES

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TO FORECAST HOSPITAL ADMISSIONS FROM THE EMERGENCY DEPARTMENT USING DATA MINING TECHNIQUES

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Abstract:

Crowding within Emergency Departments (EDs) can have notable negative consequences for patients. EDs, therefore, got to explore the utilization of innovative methods to enhance patient flow and stop overcrowding. One potential method is the use of knowledge mining using machine learning techniques to predict ED admissions. This work will show the collected administrative data from two major acute hospitals to match contrasting machine learning algorithms in predicting the danger of admission from the ED. Here we use three common algorithms to create the predictive models: (1) logistic regression, (2) decision trees, and (3) gradient boosted machines (GBM). Drawing on logistic regression, we identify several factors associated with hospital admissions including hospital site, age, arrival mode, triage category, care group, previous admission within the past month, and former admission within the past year. This study highlights the potential advantage of three common machine learning algorithms in predicting patient admissions. Practical implementation of the models developed during this study in decision support tools would offer a snapshot of predicted admissions from the emergency department at a given time, allowing advance resource planning and, therefore, the avoidance of bottlenecks in patient flow, also a comparison of predicted and actual admission rates.

Keyword: logistic regression, decision trees and gradient boosted machines

I. INTRODUCTION

Emergency department (ED) crowding can have serious negative consequences for patients and staff, like increased wait time, ambulance diversion, reduce staff morale, adverse patient outcomes like increased mortality, and cancellation of elective procedures. Previous research has shown ED crowding to be a significant

98. A Survey on Deep Learning Approaches to Recognize Handwritten Telugu Character

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A Survey on Deep Learning Approaches to Recognize Handwritten Telugu Character

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***Abstract*— Character recognition is one of the oldest applications of patter recognition. Recognizing the Hand-Written Character (HWC) is an effortless task for humans, but for a computer it is a difficult job. Optical Character Recognition (OCR) is based on optical mechanism which consists of a machine to recognize scanned and digitized character automatically. Automatic recognition of hand written text can be done either online or offline. Offline handwritten character recognition is the task of recognizing the image of hand written text. This paper discusses the various deep learning approaches to recognize handwritten Telugu character.**

***Keywords*— Optical Character Recognition(OCR), Telugu, Vattu, Gunitalu, Convolutional Neural Networks(CNN), Deep Learning, Support Vector Machine(SVM).**

I. Introduction

Telugu language is the official language of Telangana and Andhra Pradesh states in India. It ranked as third most popular language by number of native speakers in India [3]. It ranks the fifteenth in the Ethnologue list of most-spoken languages worldwide [4]. Optical Character Recognition (OCR) is the process of converting the images of typed, handwritten or printed text into machine-encoded text. Nowadays, the huge online collection of scanned images is available. This creates the necessity to develop an OCR system, but the complex script and grammar make the problem a challenging one.

Indian language characters have many curves. Identifying the handwritten characters for human itself is a complex task. It has been an open challenge for application developers to develop an application related to the recognition of handwritten characters for Indian Languages. Although several pieces of research exist on Indian printed characters, only a few attempts have been made towards the recognition of Indian off-line handwritten characters. Among off-line Indian handwritten work, maximum research has been done for Bangla.

Nowadays, Technology Development for Indian languages (TDIL) and Resource for Indian language technology solutions (RCILTS), Ministry of Communication and Information Technology Solutions, Government of India are taken initiation towards development of language technology. Commercial systems are developed for some Indian scripts namely Assamese, Bangla, Devnagiri, Malayalam, Oriya, Tamil and Telugu, but that can handle only printed text, not handwritten manuscript. There are several applications of OCR. Few of them are automatic mail sorting, bank cheques, library automation, reading aid for the blind, language processing and defence applications that produce lots of interest for researchers. In order to help the process of automation of preserving documents in the mentioned applications, research work is started for various Indian languages.

II. Properties of Telugu Script

Telugu is the Dravidian language and it is the third most popular scripts in India. It is the official language of the southern Indian states namely Andhra Pradesh and Telangana and also spoken by neighbour states. Telugu is a syllabic language. The Telugu scripts are closely related to the Kannada script. Officially, there are 10 numerals, 18 vowels, 36 consonants and three dual symbols.

(a) (b) (c) (d)

Fig.1 Telugu alphabet: (a)Vowels (b)Consonants (c)Vowel diacritics(vattulu) (d)Consonant diacritics(vattulu)

Like most Indic scripts, Telugu is derived from the Brahmi script and is from the family of syllabic alphabets [1]. There are 18 vowels and 36 consonants, of which 13 vowels(called achus) and 35 consonants(called hallus) are in common usage. A syllabic unit could be a vowel (V), consonant (C) or one of their combinations [2]. The combinations include CV, CC, CCV and also CCCV. In a CV combination, vowel is represented by different symbol called vattu. The shape of a vattu is often completely different from the corresponding vowel. The shape of a consonant also changes when it combines with a vowel or with another

99.Envision Foundational of Convolution Neural Network

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Envision Foundational of Convolution Neural Network

M Venkata Krishna Reddy, S Pradeep

Abstract: *Profound learning's goes to the achievement of spurs in a large number and understudies to find out about the energizing innovation. At this regular process of novices to venture the multifaceted nature of comprehension and applying profound learning. We present Convolution Neural Network (CNN) EXPLAINER, an intelligent representation instrument intended for non-specialists to learn and inspect (CNN)-Convolution Neural Network a fundamental profound learning model engineering. Our apparatus tends to key difficulties that fledglings face in finding out about Convolution Neural Network, it can be distinguish from pointing with educators and input with past understudies. Convolution Neural Network firmly incorporates representation outline that sums up the construction of CNN, and on-request, dynamic visual clarification sees that assist clients with understanding the hidden parts of CNNs. Constantly published changes across levels of deliberation, our device empowers clients to examine the exchange between low-level numerical activities and understible level model designs. A subjective client study shows that Convolution Neural Network EXPLAINER helps clients all the more effectively comprehend the inward operations of CNNs, and is drawing in and agreeable to utilize. We additionally determine plan exercises from our examination. Created utilizing current web innovations, CNN EXPLAINER runs locally in clients' internet browsers without the requirement of establishment or particular equipment, widening the general preparation with current profound learning strategies.*

Keywords: *CNN, Deep learning, Visual Analysis , AI*

I. INTRODUCTION

As the Composition of Convolution Neural Network is the series of layers of convolution which intends for scope revealing with MLP-Multilayer perception which is also known as FC layers –Fully Connected in Figure 1[7][8]

Fig. 1. Convolution Neural Network Basic Architecture

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The primary layer gets the info picture addressed in three shading channels, the channels of RGB At that point, the main layer results the convolutions of the information picture with numerous pieces, bringing about a bunch of highlight guides of the primary layer. Each component map decides the power and area of a particular element. The element map removed by a convolution layer can be submitted to a down sampling activity known as Pooling. The Pooling activity is discretionary, so it may not follow each convolution layer. The consequence of a Pooling layer is another arrangement of highlight maps, with similar number of guides, however with decreased goal. The accompanying convolution layer utilizes the element map from the past layer to execute more convolutions and produce new component maps. The element reaches from the last layers are the contribution of the classifier, the Fully Connected layers.

[13]The Operation denoted here is

$$s(t) = (k * x)[t] = \sum_{a=-\infty}^{\infty} k[a]x[t-a] \qquad (1)$$

Here x is being a type of input, which is a sensor signal, time is given t , k is kernel applied. As we have the property of Convolution operation of commutative that means (x * k) = (k * x) as

$$s(t) = (x * k)[t] = \sum_{a=-\infty}^{\infty} x[a]\,k[t-a] \qquad (2)$$

$$= (k * x)[t] = \sum_{a=-\infty}^{\infty} k[a]x[t-a]$$

At this process , the cross correlation operation is not commutative

$$s(t) = (k * x)[t] = \sum_{a=-\infty}^{\infty} k[a]x[t-a] \qquad (3)$$

The commutative property of the convolution rises out of the way that the portion is brassy comparative with the information. The result of index happens from the flip of list control. It is to Note that the list for the info x is a and the file for portion is $t-a$. Despite the fact that the commutative is an important property for composing numerical evidences, it isn't as applicable for neural organization usage.

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100.Prediction of Liver Disease Using Machine Learning Algorithm and Genetic Algorithm

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Prediction of Liver Disease Using Machine Learning Algorithm and Genetic Algorithm

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ABSTRACT

One of the most vital causes of death worldwide is liver disease. We, humans, have come a long way in the medical field and scientific advancements to treat diseases and it's evident that when these liver diseases are detected early, they can be treated easily. In order to be able to accurately predict if there's a chance of the liver disease it is imperative to identify the features/symptoms which play a significant role in causing the Liver Disease. In order to improve the performance of the prediction models, it is important to choose the right combination of significant features.

A new system is proposed that identifies the significant features and then predicts whether or not a person may suffer or is suffering from Liver Disease using the identified features. Our system ought to be used as a supplementary tool in diagnosis. Data is essential and we will be using the dataset available on the UIC repository. We will be using genetic algorithms to identify the significant featuresand then use those features to train different classification models like k-Nearest Neighbors, k-means, Random Forest, Support Vector Machines, Naïve Bayes, Logistic Regression, etcetera which will predict if there's a chance of Liver Disease for a person's data. We will also be using neural networks with back propagation to perform binary classification.

Ideally our proposed model identified the significant features and finds the best model which predicts the Liver Disease with more accuracy or another statistical measure.

Keywords

Machine Learning; Deep Learning; Neural networks; classification techniques; genetic algorithm; and data mining

INTRODUCTION

Problem Definition including the significance and objective

Liver is the cleaning and detoxification mechanism of our body. If there is any problem with our livers, our bodies cannot properly dispose of its wastes. This can lead to several other problems. Liver diseases are responsible for around 2% of the world's deaths. Early diagnosis of these diseases helps in preventing from deaths. This project tries to help medical professionals detect liver diseases in its early stages and help reduce the rate of liver diseases.

101. Power Efcient VLSI Architecture of 4X4 Modifed Column Bypassing Multiplier

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Power Efficient VLSI Architecture of 4X4 Modified Column Bypassing Multiplier

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ABSTRACT

In this work, 4X4 multiplier which has high speed and less power dissipation is mooted using CMOS VLSI circuits. The crucial parameters in chip design are area, time, power and speed. In the recent scenario, speed and power has made an important concept in Signal Processing practical applications. Various methods are available to optimize .The technique that has been discussed is a high-speed and Low power Multiplier designed based on our Column bypassing technique which is modified and primarily used for reducing the power activity in terms of switching. As this method offers more dynamic power savings, in spite of their interconnections. This paper presents a power efficient VLSI Architecture of 4x4 multiplier. The proposed design is done CMOS Technology in Cadence Virtuoso environment with working voltage supply of ±1.8v

Keywords

Braun 4X4 multiplier, bypassing column multiplier, low power , High speed

Introduction

With a view to implement less delay, less power and area wise efficient and mobile design of electronics is typically impugning problem for the designers of hardware in the recent times . Portable mobile phones, cards which are with smart technology, listening aid technology such as PDAs are the example of mobile consumer electronics. The major objective of the above mentioned product are to have good operating capability and also to increase the battery working hours . Less power VLSI circuit techniques used in every hierarchy of system such as system , circuit and architecture level. More power dissipation savings can be obtained it is implemented in system level of design. Large amounts of Power dissipation can be decreased at level of design but it is at cost of delay and over headed area .Pipelining and parallel processing can also be applied at architecture and system level to reduce the power dissipation and to increase the speed . Thus, power dissipation can be lowered by the improvement in fabrication methods such as reduced feature size, very small low voltages, interconnects and insulating material with lesser dielectric constants. Threshold voltage, voltage scaling at the circuit level , sizing of Transistor, power down strategies of network restructuring and style of logic employed predominantly to gain lesser power. Some logic methods useful in the propagation delay reduction and area occupancy reduction..

Applications such as FFT and video processing and filtering are done by digital signal processors. They perform operations like MAC. Multiplication function is the main function in digital signal processors. During multiplication process, transistor undergoes high switching activity. In processor operation such as FFT , Multiplier circuit dissipates nearly thirty percent of power and utilizing fifty percent of chip area. Here by, multiplier circuit consumes more energy and also it takes more time for computation. Different techniques are applied internally and externally in the previous schemes, in order to get energy efficient designs of multiplier. Schemes which are external are linked to the only input data attributes,