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Premonition of Terrorist Exertion Applying Supervised Machine Learning Proficiency

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Abstract: ***This undertaking examines an incorporating AI approach for arrangement and investigation of Global Terrorist Activity. Machine learning-based data processing is usually applied to predict acts of terrorist events by which the experts expect to urge a transparent picture of what the terrorists are pondering to accentuate defense against these organized acts. This project focuses on the prediction of terrorist activities from the Global Terrorism Database (GTD) with Supervised Machine Learning algorithms. Random Forest, k-Nearest Neighbor, Logistic Regression, Support Vector Classification, Decision trees, Linear Regression, Gaussian Naive Bayes, Linear Discriminant Analysis are adopted during this project. Finally an in-depth comparison of classification performance is presented, where classification precision ranges between 84-93% which validates the feasibility of applying machine learning to the terrorism field.***
Keywords: Terrorism; prediction; machine learning; accuracy

I. INTRODUCTION

Terrorism is an evolving phenomenon, i.e. it's not like terrorism is to happen before, but terrorism was happening, is going on and it'll happen within the future too. So developing such future onslaught prediction model goes to be useful which insist military people be alert by providing the knowledge about what kind of attack might happen within which location, its probability of happening, so there'll be some chance of preventing upcoming onslaught by we'll reduce
the consequence of an attack like security threat sort of a lifetime of a victim and stability threat like future and short term economic instability of country being attacked, infrastructure destruction so on.

The historical backdrop of terrorists might be a background marked by notable and generally noteworthy people, elements, and occurrences related, regardless of whether appropriately or wrongly, with psychological warfare. Researchers concur that psychological oppression is additionally a contested term, and not many of these marked terrorist oppressors depict themselves characteristically. It's regular for challenger during a brutal clash to explain the decision side as psychological militants or as rehearsing terrorism. In our inclusion of psychological oppression, we depend unequivocally on information from the Global Terrorism Database (GTD), which represents psychological warfare as "acts of violence by non-state actors, perpetrated against civilian populations, intended to cause fear, to grasp a political objective." Its definition avoids brutality started by governments (state fear based oppression) and open battle between restricting troopers, though on the off chance that they're non-state on-screen characters. In our definitions segment we give the GTD's increasingly detailed definition, moreover to others like that of the United Nations.

Terrorist attacks are increasing at an excellent pace across the planet. According to the worldwide association meaning of Terrorism," any activity with a political objective that is expected to make passing or genuine substantial mischief regular folks". inside the most recent year, around 22 thousand occasions happened comprehensively, causing more than 18 thousand losses. The variables bringing about fear-based oppression change after some time since they're needy upon various political and social reasons. Other than anticipating the clarification behind the assault, the ID of the dependable organizations is moreover troublesome. There has been a death of the data regarding patterns of widespread terrorist behavior.

The current investigations are either contextual investigations or the usage of quantitative techniques like regression analysis. The previous of those are particular to certain events, while the last methodology is limited to meetings of regular citizens affected by the assault. A large portion of those investigations depends on factors like weapons utilized for the assaults and furthermore the number of people hurt. Different sorts of observation remember the inquiry of peculiar examples for singular practices or addressing prisoners to gather information on the assaults. This exploration is focused on sifting through the connection between's terrorism and its causal variables.

Existing endeavors haven't been satisfactory for expectations. AI approaches can advertisement in foreseeing the probability of a demonstration of psychological oppression, given the predefined information. The after-effects of this work can help security organizations and policymakers to annihilate terrorism by taking important and successful measures.

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Accuracy Detection & Classification of Skin Disease Detection using Image Processing and Neural Network

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Abstract: ***Dermatology is one among st the foremost unpredictable and troublesome terrains to diagnose thanks to its complexness. In most developing countries, it's costly for an over sized variety of individuals. in keeping with World Health Organization (WHO), skin diseases ar the foremost common non-communicable diseases in Asian nation. the ever-present use of smartphones in developing countries like Asian nation has spread out new avenues for cheap identification of diseases. The camera in smartphones will wont to exploit the image process capabilities of the device for identification. The planned system deals with the creation of AN application that helps in identification of disease of the skin. It uses image process and machine learning technology to sight diseases. The system consists of two parts- image process and therefore the machine learning. The image process half deals with applying numerous filters to the pictures to get rid of noise and create them uniform. it's necessary to get rid of the unwanted parts from the image before process else it'll have an effect on the output potency. The Machine learning half deals with the process of knowledge and generation of result.***
Keywords: Skin disease, Machine learning, Image processing, CNN, Multi-SVM.

I. INTRODUCTION

The term digital image refers to process of a two-dimensional image by a electronic computer. during a broader context, it implies digital process of any two-dimensional knowledge. A digital image is AN array of real or advanced variety's delineate by a finite number of bits. a picture given within the kind of a transparency, slide, photograph or AN X-ray is 1st digitized and keep as a matrix of binary digits in storage device. This digitized image will then be processed and/or displayed on a high-resolution tv monitor. For show, the image is keep during a rapid-access buffer memory, that refreshes the monitor at a rate of twenty five frames per second to provide a visually continuous show.

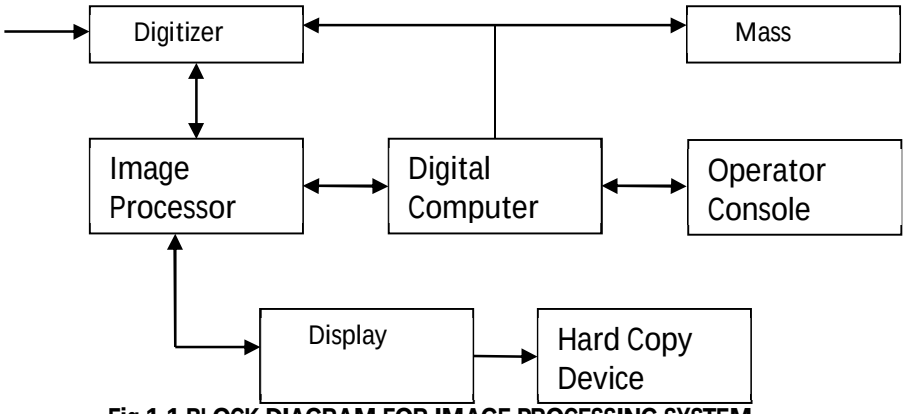

Fig 1.1 BLOCK DIAGRAM FOR IMAGE PROCESSING SYSTEM

A. Description of The Dataset

We compiled our dataset by grouping pictures from totally different websites specific to skin diseases.
The info has 320 pictures of each unwellness (80 keratosis pictures, eighty Basal CellCarcinoma pictures, eighty Dermatofibroma pictures And eighty birthmark Images).

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Real-time Facial Expression Recognition using Convolutional Neural Networks

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Abstract: ***A facial recognition framework is an innovation fit for distinguishing or checking an individual from an advanced picture or a video outline from a video source. There are different strategies in which facial acknowledgment frameworks work, yet as a rule, they work by looking at chosen facial highlights from given picture with faces inside a database. It is likewise depicted as a Biometric Artificial Intelligence based application that can interestingly distinguish an individual by dissecting designs dependent on the individual's facial surfaces and shape. While at first a type of PC application, it has seen more extensive uses as of late on portable stages and in different types of innovation. Despite the fact that the exactness of facial acknowledgment framework as a biometric innovation is lower than iris acknowledgment and unique mark acknowledgment, it is broadly embraced because of its contact less and non-intrusive procedure. Al and man-made reasoning abilities in the product map recognizable facial highlights numerically, search for designs in the visual information. One of the significant points of interest of facial acknowledgment innovation is safety and security.***
Keywords: Machine Learning; Deep Learning; Faces; Expressions; Emotion; Age; Gender; Convolutional Neural Networks;

I. INTRODUCTION

Up to this point, the facial acknowledgment innovation was normally seen as something straight out of sci-fi. In any case, over the previous decade, this pivotal innovation has not quite recently gotten suitable, it has gotten across the board. Truth be told, its hard to peruse innovation news nowadays without seeing something about face acknowledgment. There are a few ventures profiting by this innovation. Law authorization offices are utilizing the face acknowledgment to keep networks more secure. Furthermore, cell phone organizations are utilizing face acknowledgment to furnish buyers with new layers of biometric security. This innovation has been underway for quite a while. This post will investigate the historical backdrop of face acknowledgment so as to reveal insight into how this trans-developmental tech became, and how it has advanced after some time.

Starting in 2010, Facebook started actualizing facial acknowledgment usefulness that recognized individuals whose appearances might be included in the photographs that Facebook clients update day by day. While the component was in a flash questionable with the news media, starting a huge number of security related articles, Facebook clients everywhere didn't appear to mind. Having no evident negative effect on the site's utilization or ubiquity, in excess of 350 million photographs are transferred and labeled utilizing face acknowledgment every day.

II. LITERATURE SURVEY

Eiichirou Kosugou Et al [I] in 2018, explains a heart rate pulse discovery gadget and a facial acknowledgment framework with the pulse identification gadget as indicated by a facial acknowledgment handling unit, a pulse location unit, and a verification unit. The picture sensor distinguishes episode light by an infrared pixel, and yields recognized infrared data. The facial acknowledgment handling unit perceives the essence of an individual dependent on picture data signal caught by the picture sensor.

Shivam Gupta Et al [2] in 2018, presented the completely programmed acknowledgment of facial feelings utilizing the PC vision and AI calculations which characterize these eight distinct feelings. We attempted numerous calculations for the arrangement yet the best which came out of the outcomes was the help vectors machines with the precision of around 94.1%. Our outcomes suggest that client free, completely programmed ongoing coding of outward appearances in the persistent video stream is a feasible objective with present intensity of the computer.

Nazia Perveen Et al [3] in 2016 specifies that they utilize these methodologies: Support Vector Machine, Artificial Neural Network and K Nearest Neighbors. In design acknowledgment, the k-Nearest Neighbors calculation (or kNN) is a non-parametric technique utilized for characterization and relapse. In the two cases, the info comprises of the k nearest preparing models in the element space. In pre processing we take the picture and pre processed with utilizing these strategies then after this highlights extraction.

An Efficient and Effective Framework for Capability Enhancement of Wi-Fi Sharing Systems in Ubiquitous Computing Environment

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Abstract: Ubiquitous computing provides the most recent fifth generation mobile networking system with astonishing amount of mobile traffic, mobile users and the networks. The belief is that distribution of Wi-Fi service is a windfall in facilitating 5G Ultra Dense Networks (UDN). This is the most requisite for covering the network and wireless broadband connections completely. Further research activity has been started by the team to beat the boundaries of initial deployment of the Wi-Fi services. Accordingly FOg CloUd Slicing (FOCUS) has been considered as the fitting way for expanding the 5G UDN capacities. With the intend of providing multiple service and multi-tenancy for large service networks , Cloud Slicing which provides end to end networks has been applied on the top layer of Wi-Fi distribution. This satisfies all the requirements defined and makes a complete utilization of the software approach. A real prototype is deployed to evaluate the feasibility of FOCUS system and this allows fetching the accurate results of functional principles defined in FON Wi-Fi distribution system. The outcome of proof- of-concept from the system level can be obtained along with the FON system. The relative results show that FOCUS provides better and appropriate results than FON. FOCUS offer more benefits by providing end to end cloud slicing networks ensuring the deliverable services independently during the run time along with the resource adaptation.

Keywords: Ubiquitous, FOCUS, FON.

1. Introduction

Ubiquitous computing is a platform in which processing of information is linked with each activity or object as received. It involves connecting electronic devices, including embedding microprocessors to communicate information in 5G networks. Devices that use ubiquitous computing have constant availability and are completely connected. The development of various network paradigms such as Ad-hoc network based Mobile Ad-hoc Network, Vehicular Ad-hoc Network and Distributed network based Wireless Sensor Network (WSN), and resource sharing in Software Defined Networks (SDN) paves a stronger foundation to conceptualize a unique applications applicable in various field of civil and military activities. The collaborative challenges of such heterogeneous network with varied communication standards and computing mechanism pose unique challenges to realize the ubiquitous application. The scale, density and types of sensor build the space of ubiquitous computing with wireless sensor network.

An anticipated volume of information has been exchanged in the telecommunication networks with the rise of information and communication integration technologies which are using a wide-ranging spectrum of devices. This results in the larger growth of UDN that contains unforeseen number of connected devices. When the number of devices increases in the UDN, there is a necessity of smaller cells that has to be deployed to include the enormous amount of traffic. The development of UDN is just not restricted to the particular scenarios but its deployment takes over several requirements which range from low latency to higher broadband [1].

Requirements can be tackled in a various dynamic ways flexibly even though the performance growth of 5G networks is independent [2]. At run time, there are several traffic demands that rises with the cognition process. This can be solved by the core mechanism as software process [3] and this software process stands as an outstanding process that can resolve the various traffic demands in any typical network environment of ubiquitous computing.

The research has been conducted into various layers of WSN, which are to be considered as technological evolutions of the methodologies, to realize the success of wireless sensor network. At the same time to realize

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Insights on Significant Implication on Research Approach for Enhancing 5G Network System

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ABSTRACT

With the exponential growth of mobile users, there is a massive growth of data as well as novel services to support such data management. However, the existing 4G network is absolutely not meant for catering up such higher demands of bandwidth utilization as well as servicing massive users with similar Quality of service. Such problems are claimed to be effectively addressed by the adoption of 5G networking system. Although the characteristics of 5G networking are theoretically sound, still it is under the roof of the research. Therefore, this paper presents a discussion about the conventional approach as well as an approach using cognitive radio network towards addressing the frequently identified problems of energy, resource allocation, and spectral efficiency. The study collects the existing, recent researches in the domain of 5G communications from various publications. Different from existing review work, the paper also contributes towards identifying the core research findings as well as a significant research gap towards improving the communication in the 5G network system.

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1. INTRODUCTION

At present, the usage of the fourth generation or 4G network is prevalent everywhere globally [1]. However, there are increasing demands of maximized mobile broadband in order to cater up the dynamic application and services e.g., interactive media, 4K video streaming, real-time collaboration, remote working environment, virtual reality, etc. However, with the exponential rise of mobile users as well as application the inefficiency of the 4G network has already surfaced in commercial markets. This leads to hope of fifth generation (5G) network [2], which is claimed to overcome the limitation of 4G. It is claimed that usage, as well as the adoption of the 5G network, offers a new range connection e.g., safer transportation system, smart cities, homes, school, smart manufacturing units, etc. [3]. Apart from this, it is believed that the 5G network will offer a better form of connectivity between machine-to-machine and device-to-device. As 5G network offers adoption of machine learning, it is possible to make the network quite smart and decisive with evolving smart appliances. It also offers tangible advantages to society by supporting novel IoT technologies, ubiquitous connection, reduced energy consumption, larger coverage, and smart data management [4]. It offers the capability of massive machine type communication as well as an ultra-reliable communication system with low latency. It is interesting to know that the user plane of 5G encapsulates the control plane of 4G, which will mean that both 4G and 5G work together. It is also known that 5G offers a completely standalone operation. The frequency of the 5G network supports less than 1 GHz coverage for device-to-device communication. The complete architecture of the 5G network is composed of a radio access network as well as the core network. The radio access network comprises of towers, cells that bridges communication between the user with the wireless device and the core network. Basically, the core network will consist of the data network to manage different communication/connection [5]. It is also believed that the core network of 5G is integrated with cloud-based services as well as the internet in order to offer distributed servers. The complete 5G technology is designed

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RESEARCH ARTICLE OPEN ACCESS

An Overview on Structure, Characteristics and Development of an Expert System

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ABSTRACT
Expert systems are the most prevalent area of the artificial intelligence. It is the predecessor of the current day artificial intelligence, deep learning and machine learning systems. The Expert systems are designed to solve complex problems by reasoning through bodies of knowledge, represented mainly as if-then rules rather than through conventional procedural code. The expert systems are more efficient and accurate compared to human experts. The more experience entered into the expert system, the more the system can improve its performance AI is used in everything from gaming, to creating smarter computerized opponents, to robots that can assist humans in nearly every facet of life. Expert system provides solutions for the most complex issues in various domains.

Keywords : - Expert System, Artificial Intelligence, Knowledge Inference, Knowledge Base

I. INTRODUCTION

Artificial Intelligence is the study and development of machines that are capable of having intelligence equal to or better than a human being. In artificial intelligence, an expert system is a computer system that emulates the decision-making ability of a human expert. Category of programs that deals with assisting in decision- making in well-defined areas of knowledge are called expert systems. Expert systems have specific knowledge to one problem domain, e.g., medicine, science, engineering, etc. The expert's knowledge is called a knowledge base, and it contains accumulated experience that has been loaded and tested in the system. Much like other artificial intelligence systems, expert system's knowledge may be enhanced with add-ons to the knowledge base, or additions to the rules.

Artificial intelligence is a relatively young science. Emerged during sixties of the 20th century and from then until today, on its development and improvement are working teams of scientists from all parts of the world in specially equipped laboratories. Over time and developing, the computer data processing is increasingly turning to symbolic data, and less toward numerical. Artificial Intelligence is the study and development of machines that are capable of having intelligence equal to or better than a human being. As a result, AI has many different applications today and few of them are

MYCIN: It was based on backward chaining and could identify various bacteria that could cause acute infections. It could also recommend drugs based on the patient's weight.

DENDRAL: used for chemical analysis to predict molecular structure.
PXDES: used to predict the degree and type of lung cancer
CaDet: It can identify cancer at early stages
Pathfinder: It seeks and diagnoses lymph-node diseases.

II. NEED OF EXPERT SYSTEM

Human expert can resolve many issues based on expertise, intelligence and knowledge acquired within them. They can use decision-making capabilities to provide a solution for different problems and are also capable of expressing and reasoning in various situations. Over time and developing, the computer data processing is increasingly turning to symbolic data, and less toward numerical. An Expert System is an interactive and reliable computer-based decision-making system which uses both facts and heuristics to solve complex decision-making problems. It is considered at the highest level of human intelligence and expertise.

A human expert and expert systems differs in the fact that, expert system has the capability of making conclusions and can give explanation. can explain their actions, justify their conclusions and provide information about the knowledge they possess where as human experts are unpredictable and expensive. It's difficult to transfer the knowledge from them and sometimes hard to understand their actions, ideas and reasoning behind their decisions. Expert system helps to distribute the expertise of a human. It may contain knowledge from more than one human expert thus making the solutions more efficient. Emotions are involved

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Analytical Tool and Sales Forecasting Model

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ABSTRACT: Supervised learning algorithm will construct complex features using simple features such as opening date for a restaurant, city that the restaurant is in, type of the restaurant, demographic data (population in any given area, age and gender distribution, development scales). Applying concepts of machine learning such as support vector machines, random forest, linear regression, Lasso regression and Logistic regression, on these parameters, it will predict the annual revenue of a new restaurant which would help food chains to determine the feasibility of a newoutlet.

KEYWORDS: Random forest; Lasso regression; linear regression; Support vector.

I. INTRODUCTION

New restaurant outlets cause tremendous time and capital ventures to set up. At the point when the new outlet neglects to make back the investment, the site closes inside a brief time frame and working misfortunes are caused. Finding an algorithmic model to expand the return on interests in new café locales would encourage organizations to coordinate their interests in other significant business zones, similar to advancement, and preparing for new workers. The issue be characterized as plan an computerized way to deal choose the assignment condition for new restaurant by applying ideas of Support Vector Machines, Gaussian Naïve Bayes and Random Forest on specific parameters, it will foresee the yearly income of a new restaurant outlet which would help evolved ways of life to decide its practically. The essential goal of Restaurant income prediction utilizing Machine Learning is assist Restaurants with settling on increasingly educated and ideal choice about opening new outlets. It accepts to locate an algorithmic model to build the viability of interests in new restaurant destinations. Probably the greatest component of the proposed Applications is that it plans to see the income of new outlets of existing cafenetworks.

II. LITERATURE REVIEW

Machine learning algorithms were studied for predicting the annual revenue of new restaurants. Research papers on Support Vector Machines and Random Forest were referred. A research study on restaurant opportunities in India was read for better understanding.

- Support VectorMachine

At first approximation what SVMs do is to find a separating line (or hyper plane) between data of two classes. SVM is an algorithm that takes the data as an input and outputs a line that separates those classes if possible. According to the SVM algorithm that can be find the points closest to the line from both the classes. These points are called support vectors. Now, we compute the distance between the line and the support vectors. This distance is called the margin. The goal is to maximize the margin.

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ATM Crime Prevention and theft Detection model by Wireless Technologies RFID and GSM

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Abstract: ***The Implementation of Advanced ATM theft avoidance System is brought into world with the perception of ATM wrong doing occurring far and wide. This paper manages the counteractive action of ATM wrongdoing. At whatever point burglary happens, MEMS module is present to detect crime happening at ATM machine. Proposed framework is done by ARM controller based installed framework designed for constant information gathered utilizing a MEMS module. When the theft happens this, designed system automatically alerts alarm such as buzzer, dc motor control gate, GSM sends SMS to authorized person and the status is displayed in LCD to monitor. Simultaneously this framework additionally manages the well lbeing of the client by cautioning the encompassing individuals and close-by police headquarters at whatever point the client is in risky circumstance. Here we utilize RFID module to verify ATM Card. RFID discoveres ATM card can swipe anyplace. It naturally sends burglary alert through GSM, buzzer ready individuals, DC motor entryway lock and all the status is displayed on LCD. Keil software is used to implement programmatically and execute the project successfully.***

Index Term: ARM Microcontroller, ATM, GSM, MEMS, RFID

I. INTRODUCTION

ATM was turned into indispensable correspondence & administration tool among money bank and cash card persons because of quick, comfort and human asset sparing favorable circumstances. Presentation of ATM in 1967, culprits has concocting approaches which attempt to take money from inside. Since a machine called ATM wipe out that requirement to nonstop individual inclusion, will in general be situated in spots that make them increasingly powerless against assault.

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The quantity of ATM machine being used increments, due to that recurrence & modernity of safety, dangers, designing the advanced wrongdoing avoidance estimates the peek requirement for ATM makers, monetary organizations. Because of huge misfortune for card holders and banks, we fabricate secure ATM violations avoidance system for quick and simple user friendly money transactions between banks and human being with safety and security.

II. LITERATURE OVERVIEW

In 1975, Korea trade bank presented the main ATM, trailed By Shinhan bank in 1982 by ATM Industry Association (ATMIA).

There are currently near 2 million ATMs in this World [1]. As of now, the ATM machines are not verified that much. Those are just having the card swapping office [2] at the passage at the entryway. Be that as it may, this office doesn't control the quantity of clients entered at a specific example. Number of ATMs are additionally secured under this framework are likewise not many. Another proposed verified framework is to put vibration sensor [3] into the ATM machine. In any case, in the event that the total machine is stolen, at that point it has not so much physical use. For that circumstance we need a GPS beacon on that machine, which isn't being used at this point. ATM burglary and extortion event is discernible increment in most recent couple of years.

III. EXISTING SYSTEM

In past activities, numerous analysts have built up a framework for programmed ATM security utilizing Microcontroller 8051 without any wireless data transfer system. Practically all frameworks are wired, yet now we have attempted the equivalent by the utilization of remote.

IV. PROPOSED SYSTEM

In proposed framework we are utilizing ARM7 to actualize this task, and we are utilizing GSM innovation to send the security data through SMS. We are utilizing MEMS Technology to distinguish the breakage of ATM machines and that data would be send to microcontroller then it will send to security framework. We are utilizing smoke sensor to recognize the flame mishaps. Advantage of Proposed system is Cost productive and Low Power utilization

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Novel Analytical Framework for harnessing Cognitive Radio Resource Optimization in 5G Networks

Vani B P, R. Sundaraguru

Abstract*: The adoption of cognitive radio technology is characterized by various beneficial characteristics that can facilitate better spectrum sensing performance in a 5G network and thereby acting as a boosting element towards a high data transmission rate. However, it is also characterized by various challenges that limit the significant development in resource utilization in 5G. Therefore, this paper introduces a novel and simplified mechanism that facilitates the 5G network to perform better in data transmission and its associated quality of it. The proposed system also performs modeling using practical constraints associated with the usage of cognitive radio over 5G networks using a convex optimization approach. The model is simulated using practical environmental parameters to prove that the proposed system excels better performance in faster processing and quality signal in contrast to the existing resource allocation scheme exercised in 5G networks.

Keywords: Cognitive Radio, Internet of Things, 5G networks Resource, Cost.

I. INTRODUCTION

5G network is basically meant for supporting the connectivity among the applications that demand higher data transmission capabilities [1] [2]. It consists of the transmission and communication area that ranges in the geographic area called cells. All the devices of wireless form in 5G cells performs data transmission with each other using radio waves that are facilitated by an array of the local antenna as well as sophisticated transceivers [3]. There is an ongoing study that discusses the usage of millimeter waves to further improve the transmission rate in 5G.[4]. It is believed that the adoption of 5G offers supportability towards millions of communication devices, which offers an appropriate communication bridge in Internet-of-Things (IoT) networks [5][6]. However, apart from the beneficial aspect of a 5G network, it has associated challenges, too [7]. The first challenge is associated with the usage of the frequency band in 5G networks as there is less number of higher spectrum band availability.

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The second challenge is associated with the coverage and the deployment aspect of 5G network as it has a restricted range of operation. For higher range, beamforming is used for supporting higher frequency; however, still, the challenges remain, which are the usage of 5G antenna. The third problem is associated with building cost and purchasing costs associated with initial network construction, which is quite higher. The fourth problem is associated with the supportability of the device, which is extremely less in present times. The fifth challenge is associated with security issues in 5G. In the present time, it has been seen that the adoption of cognitive radio offers a significant advantage to improve the performance of a 5G network [8]. The biggest capability of cognitive radio technology is its potential to address the scarcity problems of the spectrum with the aid of accessing dynamic spectrum as well as sharing spectrum [9]. Interestingly, this process of cognitive radio technique has absolutely no dependency on increasing the expenditure of surplus resources of radio frequencies. It can significantly control the cost, capital, and overall expenditure. The existing research trend is basically to ensure that there is a presence of multiple spectrums with multiple heterogeneous wireless networks considering multiple attributes of it viz. space, frequency, time, polarization, etc. There have been various survey work carried out on the cognitive radio network on 5G, where various environmental scenarios have been considered viz. presence of microcells and small cells, ii) presence of communication system and radar, iii) the presence of different satellite services, etc. [10]. By including intelligence towards different types of wireless networks, cognitive radio technology can offer various beneficial information to the 5G networks. Moreover, harnessing the capability of the smart antenna with better beam forming capacity can actually boost the performance of 5G networks. Apart from this, usage of Licensed Shared Access over cognitive radio technology dynamically can facilitate better sharing of spectrum, time, and frequency. Finally, cognitive radio also assists in integrating various devices of self-organizing capability that can be built with more potential to further assists in forming a network with self-optimized wireless nodes in the 5G network. However, it is not that simple to incorporate cognitive radio in the 5G network as it has its own challenges that are required to be explored and investigated. The biggest challenging factor associated with the usage of the cognitive radio over the 5G network is the resource constraint, which is quite difficult. Hence, the proposed system has introduced a novel analytical solution that is meant for overcoming the performance tradeoff associated with resource allocation in a 5G network when cognitive radio is incorporated.

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Agriculture Field Monitor and Auto Control Over Wireless Network IOT

G Ahmed Zeeshan, R Sundaraguru, Perumandla Ramya

Abstract *— Agribusiness assumes to be a significant job in creating nations. In India, most of the population depends upon the country development. Accordingly, the Project goes for impacting horticulture business to splendid using computerization and IOT deployment. Rather than checking the scenario through Web View application in any mobile phone. In this scenario paper, we are using three sensors. The Moisture sensor, estimates the Moisture level of particular plants. The Moisture level is under check continuously and passes data to the Arduino board. It controls the Water Pump ON and OFF according to the Moisture Level of water to the plant. Another primary part of this venture is Light power sensor. It detects the Light Intensity of it, and it sends the data to the microcontroller. Temperature and Moisture sensor procure the information which will be displayed on the LCD and information moves to web server using WIFI module. IoT gets the data and settle on real basic leadership processed by getting various qualities from sensors like soil Moisture, Temperature and light power, water quality and so on. This paper revolves basically around using less water, & limiting the manual work for agriculture, with the goal that we can save time and money.*

Index Term: Arduino, Agriculture, IoT, Relay, Soil Moisture

I. INTRODUCTION

The World is growing smartly with advanced implementations in different sectors as well as agriculture. Smart irrigation and agribusiness is the present trending business in the world to reduce the water usage in the fields and reduce manpower, easy works and quick access mode. To make smart irrigation and agribusiness, we attached advanced sensors along those wireless modules to implement same parameter as said above. Remote sensors or web of things is successfully utilized in the horticulture field for observing and controlling the diverse soil parameters of the land towards expanding the efficiency and sparing the electric power, water use and labor. Various sorts of sensors are utilized to distinguish different sign of soil level, yields and condition correspondence strategies are utilized in conveying the information gathered and transmitting the control signals. Smart or intelligent Agriculture system deals with some wireless sensors with auto water control, plough, seed releasing, control water level.

II. LITERATURE OVERVIEW

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The new situation of diminishing water, evaporating of waterways and tanks, flighty condition, present a pressing need of legitimate liquid usage. Sensing modules are used to observe to determination of different parameters of Harvesting [1]. Following investigate in the farming ground. Be that as it may, utilization of innovation in the field of agribusiness assumes a significant job in expanding the creation just as in lessening the labor. A portion of the examination endeavors are accomplished for the improvement of ranchers that give frameworks which utilize advancements accommodating for expanding the farming yield [2]. In previous researches done in irrigation system that is all implemented in the machinery in advance due to which only collecting data but no smart operation. The evolution of the irrigation system increased step by step, it reached the advance wireless Server and remote operated system [3]. In proposed system a minimal effort and effective wireless sensor arrange strategy to secure the soil Moisture, temperature from different areas of field and according to the need of harvest water engine is empowered [4], it proposes a thought regarding how robotic irrigation framework was created to enhance water use for farming purposes.

III. EXISTING SYSTEM

In India, horticulture is the need of the greater part of the Indian business, and it is one of the primary wellsprings of vocation. Farming likewise majorly affects financial system of the nation. Liquid utilization builds step on step that leads to prompts the issue water level shortage. On account of conventional irrigation framework agriculture system is a doing of operation in manual mode and water usage for that is immeasurable and there is no updating of weather conditions in the surrounded field. We don't know the condition of the soil, temperature, light intensity in that filed. Because of the traditional agriculture system water wastage is huge, time-consuming for completion of work is high and lot of cost is increasing day by day. To avoid all the limitations of this system we implemented a new system which improves all to make smart and simple and cost effective.

IV. PROPOSED SYSTEM

Enthusiastic irrigation frameworks offer an assortment of favorable circumstances over customary irrigation Frameworks. Brilliant irrigation frameworks can upgrade water levels dependent on things, for example, soil Moisture and climate expectations. Also, the savvy irrigation controlled gets nearby climate information that can enable it to decide when a landscape ought to be watered.

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Centralized Street Light Energy Control and Monitoring System Over IoT

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ABSTRACT--- Energy saving is very necessary need in now a days. We are introducing Energy efficient centralized energy monitoring as well as controlling automatically through Internet of things. This proposed system demonstrates energy saving street light intensity control system with low maintenance.This is done by sensing the light intensity from surroundings by LDR Depends on the LDR status street light automatically controlled. Digitization of Energy meter readings in LCD and IoT module for status monitoring. We can control the street light loads though server if in case emergency. Proposed system saves the energy in day mode and it made system is automation. Digitalization of energy meter data through server. We can monitor and control very easily, simple fast access. All input and out modules are interfaced to ARDUINO Microcontroller which process input data and provide output with help of 5V regulated power supply. In this project we used Arduino ide software to write c program and compiling.

Index Term :— ARDUINO, Energy Meter, IoT, LDR

I. INTRODUCTION

Electricity demand is increasing day by day for increasing population for need of hospitals, agriculture industrials, Household. It's very difficult to handle power distribution and maintenance. Due to that energy saving is very huge requirement in current generation. To save power or maintain we need improved technology. The proposed system Centralized energy Control Monitoring system using IOT provides better saving of energy. We can avoid this power or energy waste by implementing smart energy meters. This implemented system having smart energy meter which consume low power and current and voltage data transfer through server. We implement automated street light ON/OFF System using LDR. Due to the proposed innovative system digitalized energy meter readings, optimized, power wastage reduced and data will displayed in web page. Easy to access and control. Arduino microcontroller and arduino IDE software is used for implementation this system.

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II. LITERATURE OVERVIEW

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"ARM-based association framework utilizing unbelievable meter and Web server",2011. He proposed that designing application using ARM7 microcontroller. By using this microcontroller its not a robustness, interfacing modules are complex and cost effective, due to complex operation of working is hanging the microcontroller. Iot is interfaced to ARM controller due to that high power consuming. an insignificant performing its having.

[2] "Garrab, A.; Bouallegue, A.; Ben Abdallah" , "another AMR approach for energy sparing in Smart Grids utilizing Smart Meter and deficient Power Line Communication", 2012.He described that increasing the energy needs, we require a continues supplying board for proper working for smart energy systems. the purpose of confinement goals of energy the board, single bearing correspondence, the need of an interoperability of the various guidelines, the security of the correspondence and the ozone debilitating substance floods, prompts raise another foundation structure. the proposed correspondence framework. This blueprint is with incredible energy for preservationist and low carbon society perspective.

[3] "B. S. Koay, S. S. Cheah, Y. H. Sng, P. H. Chong, P. Shum, Y. C. Tong, X. Y. Wang, Y. X. Zuo and H. W. Kuek" , "Structure and execution of Bluetooth energy meter", 2012. He described that energy meter data monitoring thorough wireless communication technology Bluetooth. Due to Bluetooth having very less distance of data transmitting efficiency of the system decreases, power consumption is also very high. He proposed microprocessor instead of microcontroller which is huge cost.

III. EXISTING SYSTEM

Present existing system of energy monitoring system is consuming more power. This system is controlled automatically but there is no digitalization of energy data transfer from the installation place to monitoring. Due to this existing system have many limitations that are power wasting more in day times there is no emergency mode control of system. It takes more time to transfer data to monitoring station this delay leads to may limitations. No smart metering system which deals no exact particular data of current or voltage consumed by the load.

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Wearable Wireless Sensor System with RF Remote Activation for Industrial Applications

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Abstract—These days , Sensors are playing very important role in the world with combination of Wireless Technology.Wireless Sensor System makes the human life simpler and smarter . This emerging Technology helps in Industrial Applications .Safety and Security standards to employee position observation and industrial premises monitoring is also important towards safety Industrials. In this paper we are introducing advanced sensor system called Wearable Wireless Sensor System . It is the combination of Wireless Sensors and Wearable Technology for significant safety enhancement in Industrials. We built up a wearable wireless sensor framework which is appended in a consistent wearable format & utilized to work environment observation. Wireless Sensors are temperature, smoke sensor and LPG Gas sensor. The fundamental element of designed framework is likelihood could be actuated wirelessly through a RF module with radio signal at a frequency of 850MHz to 865MHz .It performs different wearable sensing module framework, for example, changing the framework from rest, estimation, and information transmission modes when outside RF sign is accessible. The exploratory information exhibit that the actuation separation distance is 2.8 m to a RF module with an intensity of 28 dBm. Advanced Wearable System framework can signalize about worker nearness in connection to offices. If any alert through high temperature, smoke or gas leakage RF wireless module alert us through buzzer and we control the same thing through Wireless Technology. All info and out modules are interfaced to ARDUINO Microcontroller with procedure input information and furnish yield with assistance of 5V controlled power supply. In this task we utilized Arduino ide programming to compose c program and accumulating.

Index Term: Arduino, LPG, Smoke, RF, WearableWireless Sensor.

I. INTRODUCTION

Present day level of hardware and data innovation permits fusing electronic parts legitimately into work garbs or regular citizen garments without carrying a bodily distress towards the wear.The wireless innovation furnishes dressable gadgets with RF association , additionally this is an association with significant system administrations for capacity and handling information of each wearer. This innovation additionally gives remote observing element, the information of dressable could be detected by equipped staff distantly and connection to elements of dressable gadgets is done. There are great deals of calling in industry and administration parts which are influenced by various risks. Simultaneously, the security benchmarks for modern plants become harder as for representative state observing and checking of working ecological conditions. Along these lines, it is important to give ongoing wireless observing of both worker state and working environment natural conditions. Different kinds of Wireless Sensor Networks(WSN) have been grown as of late. These systems comprises of little hubs and are furnished with handsets, chip and sensors. They can be utilized in various everyday issues such as ecological , human checking, home computerization and so on. With the help of proposed system, advanced safety and security in Industrial Applications is new era in present and also the employee safety and monitor is observed wirelessly through this system.

II. LITERATURE OVERVIEW

Writing Survey to neutralize the perilous impacts of gas spillage, critical endeavors was completed in manipulative and scaling down the gas break locating procedure. The events of gas release related occurrences are contemplated by a few analysts and have distributed factual information episodes. In 2012, Some vital detailed "Vitality Aware Gas Sensing Using Wireless Sensor Networks" concentrating on a sensor hub, hand-off hub, remote sensor system and a system organizer [1]. System organizer is a principle element of WSN. Bolsters a system activity by wireless correspondence dependent on the IEEE 802.15.4 standard and the ZigBee determinations. The system organizer is additionally in charge of alarming a system administrator or a crisis administration utilizing the internet system or alerting a SMS using GSM modem. Indeed, after accepting the alarm with the sensor hub, a system facilitator be able to carry out the primary oppose activity by switching off harmful gas emanation by means of the remote sensors. Similar creators have additionally added to the additional vehicle security through a truck lodge , air excellence screen utilizing CO & O2 gas modules , framework structured is created and on-street tried. The consistent observing gases of CO & O2 gives included vehicle wellbeing a caution and can be put off perilous gas focuses, driver's weariness / sleepiness and Fumes hazardous gas result suicides. CO groupings of 30 ppm & O2 gas levels less than 19% practiced when driving. A "GSM Based Gas spillage Detection System" by Srivastava and Prabhukar gives a practical and profoundly precise framework,

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Comparison of Antimicrobial, Antioxidant and Anticancer Activities of ZnO Nanoparticles Prepared by Lemon Juice and Citric Acid Fueled Solution Combustion Synthesis

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Abstract

In the present work, combustion synthesis of ZnO nanoparticles using lemon juice and citric acid as fuels has been carried out. A comparative analysis of the obtained powders has been conducted to understand the strategic advantages of using lemon juice over citric acid as the combustion fuel for the synthesis of ZnO nanopartilcles. The X-ray diffractograms of both the samples revealed the presence of wurtzite hexagonal structure with the standard JCPDS pattern of zincite [36-1451] with varying crystallite sizes. Surface morphology of the samples was studied by scanning electron microscopy. Particle shapes and sizes were determined by transmission electron microscopy. Although wurtzite hexagonal structures were seen in both the synthesis methods, their morphology and sizes differed significantly with samples prepared by lemon juice presenting smaller size. The band gap energy value determined by Wood-Tauc method was found to be ~ 3.2 eV for both the samples. DPPH assay revealed the antioxidant activity of the samples at varied concentrations. Further, antimicrobial studies were greater for those prepared by lemon juice. Furthermore, trypan blue and MTT assay evaluation of nanoparticles against PC-3, HCT116, A549, and MDA-MB-231 cancer cell lines indicated enhanced anticancer activity of ZnO nanoparticles prepared by lemon juice. It was found that the sample prepared using lemon juice exhibited IC_{50} values of 78.80 μg/mL, 28.75 μg/mL, and 10.7 μg/mL, whereas the sample prepared using citric acid as fuel exhibited IC_{50} values of 103.6 μg/mL, 41.52 μg/mL, and 20.06 μg/mL, towards PC-3, HCT 116, and MDA-MB-231 respectively.

Keywords Combustion synthesis · Bio-fuel · Antimicrobial · Antioxidant · Cytotoxicity

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1 Introduction

Nature has elegant and ingenious ways of creating the most efficient miniaturized functional materials. An increasing awareness towards green chemistry and use of green route for synthesis of metal nanoparticles (NPs) lead a desire to develop environment-friendly techniques. Self-propagating high temperature solution combustion synthesis (SCS) is a simple yet reliable technique for the preparation of NPs. Conventionally, organic compounds such as citric acid, urea, and glycine have been used as fuels for the preparation of NPs [1–4]. Recently, the use of naturally available organic materials as fuels has seen upswing owing to the innovative, cheaper, and environmentally neutral implications as opposed to their conventional (chemical) counterparts. Furthermore, naturally extracted entities serve as both reducing and stabilizing agents during the synthesis of NPs [5]. The use of environmentally benign materials, namely, plant extracts,

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Efficiency of Activated Teak Leaves and Banana Trunk in the Removal of Synthetic Dye from Aqueous Solution

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Abstract

This paper deals with two low cost, locally available renewable bio-absorbents Banana trunk and Teak leaves are used in the removal synthetic dye from aqueous solution. The effect of dye concentration, bio-absorbent particle size, quantity of bio-absorbent, effective absorbance and applicability of Langmuir and Freudrich isotherms were examined. One gram of teak leaves was found to be better bio-absorbent in removing the 80% of the dye from a synthetic effluent at a particle size of 2mm x 4 mm and 91% at 600 micron adsorption of dyes by teak leaves occurred at a faster rate in comparison to Banana trunk. Both isotherms were found to be applicable in the case of dye adsorption using Teak leaves.

Keywords: Activated carbon, Teak Leaves, Banana Trunk, Chemical Activation, Adsorption Capacity

I. INTRODUCTION

Since the dawn of civilization humans have been fascinated by color. In the primitive era humans explored the natural resources of dyes available in flora and fauna for the coloration of textile fiber, marking the beginning of colorful life style and what followed the next was the invention of the first synthetic dye Maure (Maureine) by Parkin (1856). This event created renaissance and is often associated with pioneering times of British Chemical Industry. As a consequence of all the developments, at present there are more than 1,00,000 dyes available commercially (of which azo dyes represent about 70% on weight basis) and over 1 million tons of dyes are produced per year, of which 50% are textile dyes. In India alone dyestuff industry produces around 60,000 metric tons of dyes, which is approximately 6.6% of total colorants used worldwide. The largest consumer of the dyes is textile industry accounting for two third of the total production of the dye [2]. . Industrialization is the back bone for the development of any country, but the pollution caused by these industries are matter of concern. Due to the prevailing demands, it has led to large scale production which in-turn ads to the effluents produced. These effluents are highly toxic and deleterious. Dyes are extensively used in many industries such as textiles, leather, paper, wool, printing and cosmetics [3]. . Methylene blue (MB) is used in some of the textile industries has adverse impact on the flora and fauna and aquatic ecosystems .therefore, it is essential to minimize the number of dyes to the lowest possible limit approved by the Environment and Health agencies [4]. The waste water comes from textile dying is difficult to treat satisfactorily because of high composition variability and high color intensity. It is essential that approximately 2% of dyes produced are discharged directly in aqueous effluents and 10% subsequently lost during the coloration process.

II. MATERIALS

The materials used in the present investigation are Teak leaves (Tectonagrandis) Banana trunk (Musa) (Adsorbents), Methylene blue dye, 0.1 N –HNO_3 (nitric acid), 98% H_3PO_4 (Orthophosphoric acid)) (Chemicals). The apparatus used are Hot air oven, Muffle furnace, Magnetic stirrer, Centrifuge and Photoelectric Colorimeter

III. METHODOLOGY

The methodology followed in the present investigation has been given in the form of flow chart (Figure 1). The 5 ppm stock solution was prepared by using the de-ionized water and powder form of Methylene blue dye (MB). The quantity taken is 5mg of MB and mixed in the 1000ml of de-ionized water and it was placed on the magnetic stirrer to have homogenous mix and further used as stock solution.

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Geomorphological Study of Yelahanka watershed, Bangalore rural district, Karnataka, India

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Abstract

The present study area is part of Arkavathi river basin. Geo-morphological study has been carried out to understand the geo-hydrological conditions of the Yelahanka watershed. Remote sensing and Geographic information system was used for the assessment of linear, aerial and relief of the study area. Different quantitative morphological parameters like number of streams, stream frequency, stream length, bifurcation ratio etc., of the watershed reflect its hydro-geological behavior and useful when quantified in evaluating geo-hydrological reponse of the study area. The Yelahanka watershed obeys the Hortons law of relating linear and aerial aspects. GIS study has revealed the relationship between lithology, structure and morphological characters of the watershed.

Keywords: *Geomorphology, Rainfall, Drainage, Watershed, RS and GIS.*

1. Introduction

Quantitative morphometric analysis of any watershed or river basin reflects its geo-hydrological behavior and is therefore useful in evaluating hydro-geological responses of the basin. Yalahanka watershed has been studied to quantify the geo-morphological characteristics that will reveal its geographic behavior The study area exhibits the dendritic drainage pattern that produces moderate to nil flood intensity. In order to know and asses the quantity of water available for utilization to a variety of needs a systematic hydro-geological study is essential. In this contest a systematic geo-morphological study has
been carried out and results are presented in this paper.

2. Aim and Objectives

The main aim and objective of the present study is to find out the stream development in a drainage to calculate number of stream orders, basin area of the drainage, drainage density to prepare DEM (digital elevation map), drainage, soil, landuse and land cover maps for further studies. Details of these studies will reveal the presence of potential zones of groundwater occurrence in the basin. .

3. Study Area

Yelahanka watershed is a part of Arkavathi river basin. The study area is bounded by latitude 13° 06' to 13° 40'N and longitude 77° 35' to 77° 44' E at an elevation of 915 metres from the Mean Sea Level (MSL). The Yelahanka lake is 14 kms from the city centre in the north Bangalore and is very close to NH-7 (Bangalore – Hyderabad National Highway). This lake is man-made and has a catchment area of 300 acres. The main source of water is rainfall accumulated in the lake from the surrounding area including villages. The lake is often referred as Yelahanka Doddakere. as it is providing drinking water and irrigation needs to the part of the Bangalore city. The watershed falls in the semi-arid and tropical climate characterized by moderate to hot weather. The normal annual average rainfall is 914mm. The watershed is comprised of an undulatary terrain with a maximum elevation of 950m and a minimum elevation of 903m.

4. Methodology

Geo-morphological study of Yalahanka watershed is carried out by using the digital data of IRS 1C,1D of both LISS III and Pan merged. These satellite images have been geo-referenced and merged using the image processing software ERDAS IMAGINE (Version 8.5). The merged data has been used to

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An Experimental Study on Bond Strength of Concrete with M-Sand

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Abstract

The present investigation aims to study the bond strength of concrete made with M-sand and natural river sand as fine aggregates. The bond strength of M20, M25, M30 grade concretes with manufactured sand (M-Sand) and river sand is analysed. The diameter of steel bars used in this investigation are 8 mm, 10 mm, 12 mm,16 mm, 20 mm and 25 mm. All the specimens were cured for 28 days and were subjected to pull out test in the UTM. The results show that the bond strength of M-Sand is superior when compared to river sand. It is also observed that the bond strength increases with the increase in diameter.

Keywords: *Bond strength. Manufactured sand. Pullout test.*

1. Introduction

Bond strength is an important parameter for reinforced concrete to function effectively. It can be defined as the measure of transfer of load between the reinforcement and surrounding concrete. Proper bond ensures that there is little or no slip occurring between the reinforcement and concrete leading to the transfer of stress between steel and concrete. In reinforced constructions, the bond between the concrete and reinforcement is a very important factor affecting the strength of the structure. When a reinforced concrete element is loaded, the load is initially transferred to concrete and then to the steel reinforcement, the transfer of force from concrete to steel and vice-versa will be effective only if there is proper bond between steel and concrete. The various factors affecting the concrete-reinforcement bond include the strength of concrete, yield strength of steel, diameter of steel reinforcement, surface geometry of reinforcement, depth at which reinforcement is embedded into concrete. This property is crucial, as it has a major effect on the structural performance of a member. While the bond characteristics of steel and normal concrete have been investigated extensively, data for concrete with manufactured sand is lacking.

Thus in this paper an attempt is made to study the the bond characteristic of concrete containing manufactured sand.

2. Materials

Cement

OPC 53 grade as per the requirements of IS 12269:1987 was used in the manufacture of concrete.

M-Sand

M-Sand is used as fine aggregates for this investigation. M-Sand confirming to the grading zone II as per IS 383:1970 is used.

River sand

The naturally available river sand confirming to zone II is used for this investigation.

Coarse Aggregates

Well graded granite coarse aggregates, free from dust and deleterious materials is used in this investigation. Gap graded aggregates i.e. passing through 20mm IS sieve and retained on 12.5 mm IS sieve is used.

Water

Potable water is used for mixing of concrete.

Steel reinforcement

High yield strength deformed steel bars of grade Fe415 and diameters of 8 mm, 10 mm, 12 mm, 16 mm, 20 mm and 25 mm are used in this investigation.

MIX DESIGN

M20 concrete with w/c ratio 0.5, M25 grade concrete with w/c ratio 0.45 , M30 with w/c ratio 0.45 is designed as per 10262-2009 for both the set of

(4) CV

Numerical Investigation on Load-carrying Capacity of Concrete filled steel tubular columns under axial loads

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Axial load, Concrete Filled Steel Tubular Columns (CFST), Experimental data, Statistical study, Support Vector Machine technique (SVM).

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Abstract

The Concrete Filled Steel Tubular (CFST) columns are an interesting option in many modern structures in recent years due to their exquisite structural performance, with enhanced load-bearing capacity and energy absorption capacity. This investigation presents a Statistical study, Experimental study, and Support Vector Machine Technique (SVM) on the axial load carrying capacity of concrete-filled steel tubular columns. Results of tests conducted by various researchers on two hundred and thirteen samples on concrete-filled steel tubular columns are reported, and present authors' experimental data of ninety specimens self-consolidating fiber-reinforced concrete-filled steel tube columns are reported. Two companion equations were derived for the prediction of the ultimate axial load strength of concrete-filled steel tubular columns, and two more equations were derived using the SVM technique. The main parameters considered in the Equation One were - Area of Concrete, Compressive Strength of Concrete, Area of Steel, Tensile strength of Steel and in Equation Two - Non-Dimensional parameter (D/t), Area of Concrete, Compressive Strength of Concrete, Area of Steel and Tensile strength of Steel. The results from prediction were compared with the experimental data. Validations to the experimental results were made. These comparisons show that SVM has strong potential as a feasible tool for predicting the ultimate axial load carrying capacity of concrete filled tubular columns.

1. INTRODUCTION

Concrete-filled steel tubular (CFST) columns possess excellent earthquake-resistant properties such as high strength, high ductility, and large energy absorption capacity. In the last decades, they have gained increasing popularity in buildings, bridges, and other structural applications. The advantages of CFST columns can be attributed to the composite action between the steel tube and the concrete infill. The steel tube works not only as longitudinal reinforcing bars to resist the loads but also as ties or spirals to confine the concrete infill. Therefore, both the strength and ductility of the concrete are enhanced. On the other hand, the risk of local buckling of the steel tube is significantly reduced because the rigid concrete infill prevents it from inward buckling. The review on previous research indicates that experiment on axially compressed tubed RC columns is insufficient.

The current study is carried out to investigate the structural behavior and propose an analytical model for tubed RC columns subjected to concentric compressive loading and to predict the failure load. The experimental researches on CFST columns have been conducted for decades (Zeghiche and Chaoui, 2005; Zeghiche, 1988; Shakir-Khalil and Zeghiche, 1989; Shakir-Khalil and Mouli, 1990; Shanmugam and Lakshmi, 2001; Neogi et al., 1969). Surveying the available literature, it has been found out that the leading parameters which dominate the behavior and capacity of CFST columns are material properties and geometry. The critical geometrical parameters are the slenderness ratio, diameter-to-thickness (D/t) ratio, and initial geometry of columns (Ghasemian and Schmidt, 1999; O'Shea and Bridge, 2000). On the other hand, the key mechanical properties for such columns are the strength of steel and concrete. However, the studies regarding the mathematical modeling of axial load carrying capacity of CFST columns through soft-computing techniques are very limited. The above consideration has motivated the authors to develop a mathematical model for predicting the ultimate capacity of axially loaded concrete-filled steel tube short columns with a reasonable degree of accuracy. For this, a data set comprising 213 experimental data samples[1-6] were used for training and testing the model. The proposed model was derived using geometrical parameters (namely, cross-section properties) and mechanical parameters (namely, material strengths).

(5) CV

Assessment of Groundwater Quality in Hoskote Taluk, Bangalore Rural District, Karnataka, India

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Abstract

In nature the quality of groundwater is determined by quantum of water, natural recharge, chemical composition of the soil cover and its thickness, mineralogical makeup of the aquifer, residence time of the water which is governed by the transmissivity of the formation. The two important characteristics of the crystalline terrain, which covers practically the entire taluk, is in the heterogeneity and preferred flow paths. They have a dominant role to play in determining the quality of the ground water with the result; large variations are noticed in short distances. Thus it is not uncommon to get varied quality of water even in small villages. This fact is to be borne in mind while collecting sources of water supply for various uses. Water quality data in respect of various parameters of all the drinking water sources in the 26 village bore wells has been collected, analysed and presented in Table 1. Physico-chemical characters of groundwater is given table 2. Table 3 summarizes the number of wells with a quality problem in the study area. As seen the most commonly observed problems relate to the Total dissolved solids, Total hardness, Turbidity, Calcium, Iron and Fluoride. The strategy to be adopted in providing solutions to these villages is discussed.

1. INTRODUCTION

Groundwater is an important natural resource and play an important role in recent years. Water quality is directly related to the physical, chemical, biological and radiological property of water. These properties of water are affected because of the pollution of water due to various human activities. There are various parameters which can be assWessed for measurement of quality of water but when consideration of all parameters may be generates complexity towards quality. The demand for water has increased over the years and this has led to water scarcity in many parts of the world. The situation is abbreviated by the problem of water pollution and contamination. India is heading towards a freshwater crisis mainly due to improper management of water resources and environmental degradation, which has lead to lack of access of safe water supply to millions of people. Groundwater crisis is not the result of natural factor, it has been caused by human activities. During the past two decades the water level in several parts of the country has been falling rapidly due to increase in over-exploitation. The number of wells drilled for irrigation both food and cash crops have rapidly increased. India's rapidly changed population and increasing population has also increased the domestic need for water. The water required for industries also increased to a great extent. It is also noticed that competition has formed among the users-agriculture and domestic sectors, which in turn related to lowering of groundwater table. In the present study the quality of groundwater and its pollution has been checked. The pollution is mainly due to vigorous agricultural activities.

Hoskote taluk is in the eastern part of Bangalore rural district. It falls in the Survey of India (SOI) toposheet Nos. 57 G/12, 57 G/16, 57 H/9 and 57 H/13 and lies between 12°51' to 13°15' N Latitude and 77° 41' to 77° 58' E Longitude, covering an area of 602 sq.km (Fig.1). Physiographically, the area is characterized by undulating terrain. The highest elevation is found near Nandagudi hill, which rises 940m above the MSL. The low lying valleys and depressions are intensely cultivated and sloping towards southern part of the taluk. Since the taluk is very close to the Bangalore metropolitan city people in the taluk are growing vegetables, flowers and fruits from long time. People have used more fertilizers and pesticides to get more production. Due to this the soil and groundwater has polluted to certain extent.

(6) CV

Application of fuzzy logic on Groundwater Quality Assessment Using Water Quality Index

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Fuzzy Logic, Groundwater sample, Groundwater quality, Irrigation, WQI.

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Abstract

Groundwater is an important natural resource and play an important role in recent years in the irrigation activities in Chikkaballapur district of Karnataka state. Due to continuous drought situations bore well water is the main source for their irrigation needs in the district. Groundwater is the most dependant source of water to the day to day requirement for various needs in the absence of alternate sources of water supply. Chikkaballapur district lies between North latitude 13°13'04" to 13°58'29" and East Longitude 77°21'52" to 78°12'31Water quality is directly related to the physical, chemical, biological and radiological property of water. These properties of water are affected because of the pollution of water due to various human activities. There are various parameters which can be assessed for measurement of quality of water but when all the parameters considered, it may be generates complexity towards quality. So, development of Water Quality Index (WQI) is the quite popular method in the assessment of water quality. WQI will explain the whole story of water in single scoring number and it is calculated using different methods. It is helpful to decide appropriate treatment technique to meet the concern issue. In this paper, WQI and its development methods are discussed. A higher number is indicative of better water quality. WQI could be used as decision maker in the assessment of water quality index.

1. INTRODUCTION

Groundwater is the major source of drinking water in both urban and rural areas. Besides it is an important source of water for the agricultural and industrial sector. In recent years water is becoming scarce resource and has lead to recognize that the quality of water is an important as quantity. It is well established that the chemical characteristics of the groundwater determine its usefulness for Agricultural, Industrial and domestic consumption.

Artificial intelligence refers to the capability of certain techniques and tools which enables them to increase the knowledge initially provided to them through a process of inference or 'learning'. Fuzzy inference, genetic algorithms, artificial neural networks and self-organising maps are examples of AI techniques that have been employed in developing WQIs. Of these, fuzzy inference has been by far the most extensively utilised, often in conjunction with factor analysis, principal component analysis and cluster analysis.

Waters with high amount of different unwanted elements may prove fatal to the living beings. Water chemistry plays an important role in the groundwater quality which was poorly understood so far. It is believed that the natural variations in water chemistry are a random phenomenon. Though it is true, that in detail, the chemistry of groundwater is exceedingly complex, much information can be gathered and various factors that affect the groundwater quality of a particular place. A water index based on some very important parameters can provide simple indication of water quality. It gives a general idea and awareness for the possible problems with the water available and used in the region. For a common man, water quality and its suitability for drinking purpose can be examined by determining its quality index. Water Quality Index (WQI) is defined as a technique of rating that provides the composite influence of individual water quality parameter on the overall quality of water.

2. WATER QUALITY INDEX METHODS

Ramakrishnaiah et al. (2009), Srinivas Rao and Nageswararao (2013), Phadatare and Gawande (2016), Shivanna et al. (2016), Suman. and Bhaskar (2017) have worked on the assessment of WQI. The assessment of groundwater quality for domestic and irrigation purpose using standard laboratory procedures. All have concluded that the groundwater quality assessment carried out will help the irrigation engineers and the other stake holders

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Research of Algorithms used for Routing and Assigning Wavelength in WDM Networks

Hamsaveni M, Savita Choudary

Abstract—The telecommunications department is the most difficult in today's communication offering the highest amount of bandwidth. With the finest prototypes and test rigs to form optical WDM technology, many companies have appeared for a particular link request, a wavelength and a path must be allocated in the WDM network. Routing and Wavelength Assignment (RWA) problem is called the assignment of a wavelength and a path to the link request, with accessible resources. The aim of this article is to analyze the algorithms for any WDM networks for efficient wavelength assignment routing protocols. As a researcher, we plan to suggest a comprehensive literature study for the development of a new algorithm for efficient allocation and appropriate wavelength usage and the routing of data packets from source to destination to overcome all failures. Before allocation, we use simulations and analyze optic fiber communication methods, various losses depending on dynamic wavelength allocation with minimum and maximum.

Keywords: Bandwidth, wavelength assignment, WDM networks, efficient allocation, routing.

I. INTRODUCTION

We're in wireless era. Wireless communication's backbone is wired network. In network communication, optical fiber plays a very significant role. Internet use has grown quickly as the use of multimedia communication applications is also increasing and needs enormous bandwidth. Online conferences, on-demand videos, lots of devices used in day-to-day operations such as smart home, intelligent cars, etc. also require internet connection. Many of the applications require information from a high-speed internet, leading to bandwidth development. The bandwidth development in the order of Tbps per year is shown in Figure 1.With today's Internet and Asynchronous Transfer Mode (ATM) network, we don't have the ability to satisfy the growing bandwidth requirements. [1,7].

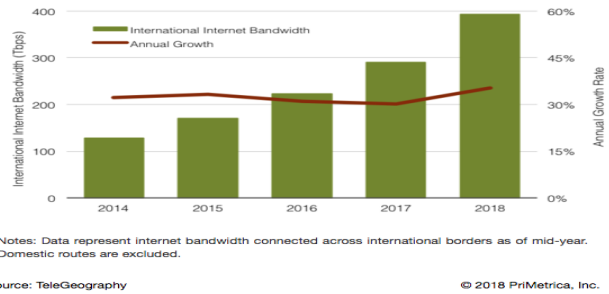

Figure 1. International Internet Bandwidth Growth, 2014–2018

Fiber optical technology is commonly used to meet the bandwidth requirements for excellent link speed, buffering, audio / video download and gaming, etc. All optical networks with multiplexed wavelength division are popular due to their limitless capacities, excellent bandwidth and low signal distortion, signal attenuation, material utilization, energy requirements and, most importantly, low cost space requirements [11]. Using separate channels (wavelengths), several optical signals are sent simultaneously to the same fiber in the WDM network. Communication occurs via WDM channels in a WDM network called light paths [12].Multiple wavelengths are used to transmit information on each fiber in WDM networks. Figure 2 shows a multi-channel transmission over the WDM scheme, each channel having a distinct wavelength and all multiplexed at one end into a single fiber line and demultiplexed at the other end [2].

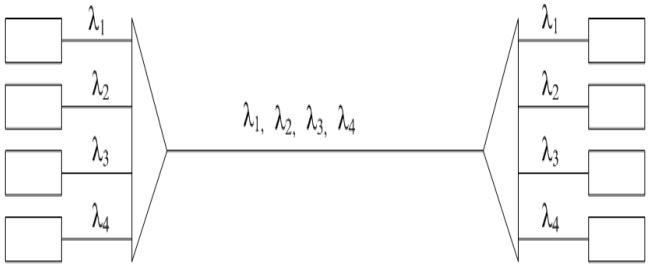

Figure 2. A basic transmission configuration system used in WDM networks

II. LITERATURE REVIEW

In wavelength WDM networks, users communicate with each other through WDM channels called light paths. The lightpath is used to support links to the WDM network [13]. The light-path will have the same wavelength for all the fiber links it passes through. Figure 3 shows the development of light paths in the WDM network.

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Predicting Harmonic Centrality In Aodv For Wireless Sensor Networks Using Machine Learning

Pallavi R., Vishal V., Tushar Sharma, G.C. Banu Prakash

Abstract - The Ad Hoc On-Demand Distance Vector routing protocol is the ideal protocol for routing in dense wireless networks. The metrics used to evaluate centrality for such networks include betweenness, closeness, degree, harmonic etc. The harmonic centrality is a better metric at leadership recognition. The authors propose an optimal machine learning approach to predict the harmonic centrality for each node based on few network parameters. The hypothesis that the distance from the source to destination contributes to the harmonic value is investigated. Regression models and Artificial Neural Networks were used to find the equation that fits the feature columns with minimum error. From the experiments, the authors concluded that the distance (closeness) does not contribute significantly towards leadership recognition in the network. Among the various approaches experimented with to predict the harmonic centrality, linear models showed a better fit and minimum error even in the case of scaling up the network.

Index Terms - AODV, Harmonic Centrality, Regression, Neural Networks

1 INTRODUCTION

The AODV routing protocol is used for in dense wireless ad hoc networks. Such Wireless Sensor Networks (WSN) can self-deploy rapidly and use the protocol to scale on demand. Hence, they can be used in self-scalable applications with rapid growth potential, especially in large scale social networks. This could also lead to a concern regarding the uncertainty in the topology especially when the scale is unprecedented. Thus there is a need for predictive metrics to identify the critical nodes that ensure a connection between clusters of nodes. Such nodes also known as leaders can be discerned effectively using harmonic centrality over closeness and betweenness. Computing the harmonic values can be computationally intensive and uncertain owing to the steep scalability index during the network growth. Hence, a predictive model that can predict the harmonic or h-values with minimum error percentage can enable monitoring of the system. The paper shows the NS2 simulation of a large network in which nodes range from 100 to1000 in number.

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Each node is characterized by its throughput, delay, energy, neighbor count, neighbors, the average number of hops, and the destination node. Our investigation is based on the hypothesis that the “closeness factor” or vicinity plays a statistically significant role in predicting the H value. The protocol attempts to predict the H value using various machine learning techniques to find an equation that predicts the value with the least absolute error.The rest of the paper is organized as follows, Section I contains the introduction of the problem, Section II contain the related work, Section III describes the methodology used, Section IV describes results and discussion, Section V concludes the key factors of the paper with conclusion and also enhances the future directions.

2 RELATED WORK

Recent papers [16] based on AODV protocol deals with the study of the creation of the dataset and the evaluation metrics for the Harmonic centrality values which are useful for the computation of the distance vector parameters for AODV protocol. D. Bhattacharyya, T.-H. Kim and S. Pal [1] suggest the idea of transferring the data based on a cluster approach for the wireless network’s path detection. D. Acemoglu, G. Como, F. Fagnani, and A. Ozdaglar [2] deal with the study of a tractable opinion dynamic model that generates long-run disagreements and persistent opinion fluctuations. The model involves an inhomogeneous stochastic gossip process of continuous opinion dynamics consisting of regular agents and stubborn agents that shows the uncertainty in the growth of the network. N. E. Friedkin [3] gives a brief description of the calculation of the centrality example and helps to obtain one for the AODV protocol which helps for the optimal path detection. M. Marchiori and V. Latora [4] give a brief about the use of social networks in great depth and helps with the study of energy and throughput which is also used by our model. A. Bavelas [5] deals with the connectivity of the group networks i.e. connectivity when many tasks are associated with the same network and the throughput is altered and optimal paths are chosen for the efficient implementation of the model. Xiaodong Wang, Daxin Zhu [6] suggests the use of A* algorithm for the dynamic allocation of the total distance values for the easier computation of the model and limit the GPU usage of the model for calculating the distance from one hop to another. [7] Suggests the use of the linear regression

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ORIGINAL RESEARCH

Crop yield prediction: two-tiered machine learning model approach

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Abstract Nutrient deficiency analysis is essential to ensure good yield. The crop yield is dependent on the nutrient contents and drastically affects the health of the crop. In this paper the nutrient deficiency of a paddy crop is considered. Tensor Flow's (Google's Machine Learning Library) is used to build a neural network to classify them into nitrogen, potassium, phosphorous deficiencies or healthy independently. It is necessary to have an optimal balance between nitrogen, potassium and phosphorous content. Tensor Flow's model identifies the deficiency using a set of images. The result is fed to "machine learning driven layer" to estimate the level of deficiency on a quantitative basis. It specifically makes use of k means-clustering algorithm. It is then evaluated through the rule-matrix to estimate the cropland's yield. A fair prediction of 76–77% was observed with two tired machine learning models.

Keywords Crop yield · Tensor flow · Neural network · Rule-based matrix

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1 Introduction

The field of agriculture has seen the implementation of technologically driven solutions in the recent history. Most of the work on field has been driven by experimentation in the labs by experts. However, the trend in recent times has been to cultivate the culture of data analytically-driven solutions that helps to pin-point the problems obstructing the sector and eventually curating the right data to find the causative factors that lead to degradation of plant health. There still remains a significant gap between the utilization of data and its analysis. The gap is even more profound in the Indian Agricultural sector. The problems pertaining to the supply-side still remains a problem even though the demand-side keeps growing. In such a paradigm where there is evident mismatch, it is of utmost importance to improve the supply-side of things. Yield prediction thus becomes a paramount feature to solve this problem. Predictive Analytics in this regard helps in analysing the supply-side of things which eventually help to overcome the challenges faced by the farmers by pin-pointing the right cause. This paper is an attempt to solve above said problem by proposing an end-to-end solution to the causative agents of ill-health of the crop and its yield prediction. The intended audience of this paper are those who to use this application immediately for analysing and predicting their crop yield.

Google's Tensor Flow Library is one of the most widely used libraries for implementation of deep learning techniques in the Python environment. It is designed especially to meet the ever-growing demands of data scientists around the world to implement the deep learning mechanisms. It is in fact a symbolic implementation of a machine learning dataflow pipeline that is compiled on the GPU or native code. The Tensor Flow aims to satisfy the basic structural

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Predicting the Stages of Chronic Kidney Disease Using Machine Learning Approach

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Abstract

A condition due to which the kidneys cannot perform its regular function of filtering blood refer to Chronic kidney disease; nowadays people belongingto different ages are suffering and coherently increasedthe deathrate of related patients,premature of diagnosis. Kidney Diseasehas become a majorproblemin the general publicall over the world, as it damages the kidney. Kidney failureis measured by GFR (Glomerular Filtration Rate). In this research work, various supervised machine learningalgorithms are used to predict and classify Chronic Kidney Diseaseand non-Chronic Kidney Disease. The dataused forthis work has been collected fromthe machine learningrepositoryand on these datasetSVM, Navie Bayes, Decision Trees and K-NN models hasbeen applied. The system has shown better resultsin classifying Chronic Kidney Diseaseand non-Chronic Kidney Disease.The results of classifiersare compared. The study concludes that among all the classifiers, the SVM and Decision Tree have performed better thanother classifiers. Stage detectionis also done by using different attributes of the dataset and proposeda system to detectand identify the different gradesof chronickidney Disease.

Keywords:
Chronic Kidney Disease, Classification, Machine Learning, SVM, Decision Tree, and Prediction

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Modelling Simple and Efficient Data Transformation Scheme for Improving Natural Language Processing

Shruthi J, Suma Swamy

Abstract*: *The importance of natural language processing cannot be sided in the current era of communication and analytics where data is exponentially growing. Although, there has been various versions and schemes that has evolved in the past decade towards improving the performance of natural language processing, but still the problem towards precisely extracting the actual context is an open ended. Review of existing studies show a large scope of new work towards improving it. Therefore, this manuscript presents a unique simplified approach where natural language processing is carried out with a combined effort of syntactical and semantic based transformation scheme. The study is implemented using analytical methodology while the secondary motive of the work is also to balance the mining performance as well as optimizing storage performance too. The study outcome shows proposed scheme to excel better performance with respect to time duration in all the internal processes being involved for data transformation.

Keywords*: *Natural Language Processing, Text Mining, Analytics, Context, Cloud

I. INTRODUCTION

Natural language processing is one of the essential concept in artificial intelligence and it bears the entire potential concept associated with computer science as well as computational linguistic too [1] [2]. Therefore, it is a domain of engineering process with capability to infer the information just like human-based language by a computer system [3]. It is quite a challenging aspect to work on natural language processing as the conventional computer system is highly dependent on languages that are highly structured while natural languages are characterized by dependencies on various complex attributes associated to a specific language (e.g. dialects of specific region, frequent usage of slangs and social context [4]. At present, there is an exponential growth of data owing to outcome of mobile network and social network usage. This abnormal rise of data also gives rise to highly unstructured data which is computationally challenging task to organize and then process [5].

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Machine-based translation system is one of the frequently used applications in natural language processing. The efficiency of performing this translational task is basically assisted by natural language processing [6]. Sentiment analysis is another frequently used application where natural language processing is utilized [7]. Another significant application of the natural language process is summarization that is about the generating a meaning and logically correct compact form of information or the given document. It will also retain information associated with the emotional taints of the data used in it. Adoption of automatic summarization assists in curtailing the redundancy fact that is possibly generated from the diversified sources of information [8]. However, the application of classification of textual content is frequently used in natural language processing. The application associated with text classification assists in looking for the data that explicitly exists in the text given in natural language processing [9]. This approach assists in extracting the level of standard emotions that resides within every terms present in corpus of feedback or opinion shared by customers [8]. All these application are developed using various available libraries e.g. Apache OpenNLP, Natural Language Toolkit, Stanford NLP suite etc [9]. However, the domain of natural language processing is yet to see its superior accuracy. The primary challenge associated with the natural language processing is about domain specification. It is nearly impossible to render universality about the knowledge graphs. A simple example to cite this is to consider a phrase"*glad working in hospital*". In this sentence, the three critical terms "*glad*", "*working*", and "*hospital*". This phrase suggests a kind of profession, or job, or work. However, the phrase "*glad to see you*" represent a personal emotional statement of a user. Another simplified example is "*Im a skilled expertise working in Microsoft windows platform*" and "*Im a cleaner and I mop windows of Microsoft Office*". This two statements has entirely two different meaning but the context of this canot be differentiated either by any existing system not using any conventional text mining scheme. It will simply mean that a system of natural language process has many explicit dependencies apart from the data itself.

A closer look into these two segments of the statement will show that a machine is more likely to get confused about extracting the inference of the constraint associated with the statement. If the system is made to be dependent only on the knowledge graph than the probability of the machine to extract vague information is quite high. Another significant challenge associated with the natural language processing is to obtain the semantic information from the sentences.

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Corpora Based Classification to Perform Sentiment Analysis in Kannada Language

Shankar R, Suma Swamy

Abstract: ***In this modern era, the users' opinions play an uncanny role in understanding how well a product has satisfied the customer requirements, so that the producer can change the product to suit the customers' demands and these reviews also help the new consumers to decide on whether to purchase the product or not. Analysis of a particular entity's feelings in terms of positive, negative or neutral polarization is known as 'Sentiment Analysis'. SentimentAnalysis is a sub-domain of opinion mining.Here the analysis is focused on the mining of emotions and opinions of the people towards a specific topic. The emotions and opinions are collected in the form of organized, semi-organized or amorphous data. As the world is slowly progressing towards regional languages, this article talks about extracting the opinions of a product in Kannada and performing analysis about these reviews and classifying them accordingly. The dataset or the corpus is scarce as it is not English. The limited corpus is being collected via website – https://gadgetloka.com through an API. However, extracting inclusive opinion manually from huge amorphous data would be a tedious task. An automated system called 'Sentiment Analysis or Opinion Mining' can solve this problem, which can analyze and extract the observation of the user throughout the reviews. In this classifier of review analysis, the process classifies the review via corpus, which is a huge collection of pre-defined data. The API that has been used is Python-Beautiful Soup via utf-8 text recognition method to parse Kannada characters. The reviews are converted to text sentence and each word of the sentence are broken down. Data mining task is done to find the sentiment of each word by comparing it with two stored files named as good.txt and bad.txt. Further, the analyzed result is given through text output as Positive, Negative or Neutral sentiments based on their weights.***

Keywords**: classification, corpora, kannada lexicon, opinion mining in kannada.***

I. INTRODUCTION

Sentiment Analysis (SA) is a prominent category in the line of textual analysis as the results have shown us that there exists a lot of scope for application and implementation. For example, one can Forecast Sentiment, detect partisanship, summarize text, break down and summarize Sentiment etc. In India, there exists plenty of regional languages like Hindi, Kannada, Telugu, Tamil, Malayalam etc. There exists many studies and research interests in the area of SA in these diverse languages. However, SA of Kannada text has not been extensively explored, especially for the purpose of analysis of products. In this paper, a case study for mobile product reviews that have been entered in Kannada is proposed. This is viable because there exist many user-generated reviews of products in Kannada, available online. Sentiment Analysis (SA) is a methodology of computation that involves characterizing, identifying, and extracting contents with embedded sentiment, such as emotions, opinions and attitudes, subjective impressions in the text, speech or databases. This SA uses concepts from Natural Language Processing (NLP) and Machine Learning (ML) algorithms. In this paper, the corpus-based technique is used to construct a sentiment lexicon. It relies on morphological patterns present in large corpus and produces the relative words with a high accuracy. Sentiment analysis (SA) also can be observed as a manifestation of an NLP problem. However, while NLP requires understanding of the context in a large corpus, SA can utilize only a few key phrases from the text and yet provide us with adequate results. Lastly, while existing research points to certain applications like detection of reasoning, this alone may not be enough to cover most use cases. Hence, it is required to do much deeper research in SA and NLP.

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II. LITERATURE SURVEY

S. Parameshwarappa et.al, discussed about generating a Kannada corpus tool for Program Execution and Reporting Language (PERL) by using the web logs. Kannada Corpus Construction algorithm is used to generate a raw corpus. The web is crawled for downloading the corpus using the seed URL's. Only about how to extract the seed words from the given corpus is discussed [1]. However, no concentration on the sentences in Kannada language is done and how to tokenize these sentences and search for a word in the generated corpus is done. Jayashree R discussed about how to retrieve the useful information from the large dataset. The sentiment classification is performed in many ways they are: word level, sentence level and passage level etc. In the paper [2], a sentence level classification is used for NLP applications such as query and replying and summarization systems. The objective of sentence level classification is to classify the text according to the sentimental polarities of opinions. A separate list is used to maintain stop words. The stop words do not giveany meaning to the sentence and restricted the word which is appearing only once in the document. A supervised learning method is used to classify the sentence to positive or negative.

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Title: An efficient approach to preserve the network connectivity for prolonged lifespan of wireless sensor networks by cautiously removing the crossing edges using COLS

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Abstract: In recent times, wireless sensor networks (WSN) have been widely used in various applications which have led to the deployment of enormous numbers of sensors leading to the complexity of the network. Extensive research has been carried out for monitoring these sensors for connectivity, coverage, load balancing, network structure etc. Study on these complex networks to maintain connectivity for longevity is a challenging task. WSN when modelled on graphs exhibit the properties of non-planarity. In this paper, we would like to propose an algorithm COLS to reduce a non-planar graph to a planar graph by removing the crossing edges carefully. The proposed algorithm preserves the topological structure without compromising QoS of the original network and finds its application as a load balancer on WSN. Experiments have shown that the algorithm accurately converts the graph on multi-dimension to a two-dimension without considering cross edges and the time complexity of the given algorithm is $O(n^2)$.

Keywords: wireless sensor networks; network connectivity; non-planar graph; planar graph.

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LITERATURE REVIEW ON APPLYING MACHINE LEARNING TECHNIQUES TO DIAGNOSE AUTISM SPECTRUM DISORDER (ASD)

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ABSTRACT

Clinical decision support systems are computer based automated systems developed with the aid of AI and ML for supporting and improving the accuracy of clinical decision-making processes. These systems are used by clinicians in making diagnostic decisions and treatment plans. It is able to simulate expertise and express logical reasoning for making assertions. Many inexperienced clinicians are not well confident in certain autistic cases because their observed diagnosis and the calculated grade may not be always similar. Availability of diagnostic experts to provide clinical expertise is also a problem in the diagnosis of autism children. Hence, there is a need of a computer assist system comprised of experience and skill of a clinician, which can advance the power of existing diagnostic method. The computer-assisted system will help to confirm the assessment decisions of clinicians. Research works about the application of machine learning techniques for the development of autism assessment and grading in this area is very much required. This work proposes an approach which uses machine learning techniques for autism grading.

KEYWORDS: *Machine Learning, Autism Spectrum Disorder*

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INTRODUCTION

Autism spectrum disorder (ASD) is a developmental disorder that affects communication and behavior. Although autism can be diagnosed at any age, it is said to be a ‘developmental disorder” because symptoms generally appear in the first two years of life. People with ASD have Difficulty with communication and interaction with other people. Restricted interests and repetitive behaviors. Symptoms that hurt the person’s ability to function properly in school, work, and other areas of life.

Autism is known as a “spectrum” disorder because there is wide variation in the type and severity of symptoms people experience. ASD occurs in all ethnic, racial and economic groups. The different factors that make a child more likely to have ASD include environmental and genetic factors. Most scientists agree that genes are one of the risk factors that can make a person more likely to develop ASD. Children who have a sibling with ASD are at a higher risk of also having ASD. ASD tends to occur more often in people who have certain genetic or chromosomal conditions, such as fragile X syndrome or tuberous sclerosis when taken during pregnancy, the prescription drugs valproic acid and thalidomide have been linked with a higher risk of ASD. There is some evidence that the critical period for developing ASD occurs before, during, and immediately after birth. Children born to older parents are at greater risk for having ASD.

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Speech Oriented Virtual Restaurant Clerk using Web Speech API and Natural Language Processing

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***Abstract*—Voice interfaces and artificial speech synthesis is revolutionizing the human computer interaction in a multitude of unimaginable ways. Predominantly gaining popularity due to their similarity to human conversation. This technology has also extended its arms to a larger neglected crowd. From placing phone calls and texting their caretakers to unlocking front doors and ordering groceries, virtual assistants are making important steps towards accessible UIs for the masses. Our project explores a specific dimension overcoming the challenges and improving the flexibility with restaurant ordering workflow. We have experimented with a system that acts as a restaurant-clerk and ameliorates the overall customer experience. Through this paper, we have researched various possible speech recognition techniques and picked the most suitable one for our application. The system implements face biometrics, innate food recommenders, and speech recognition algorithms that are deployed through python and web front-end.**

Keywords*— *Face Recognition, Machine Learning, Collaborative filtering, Convolution Neural etworks, Speech UI, Natural Language Processing.

I. INTRODUCTION

Speech recognition technology entered the public consciousness rather recently, with the glossy launch events from the tech giants making worldwide headlines. The earliest advances in speech recognition focused mainly on the creation of vowel sounds, as the basis of a system that might also learn to interpret phonemes (the building blocks of speech) from nearby interlocutors. Machine learning, as in so many fields of scientific discovery, has provided the majority of speech recognition breakthroughs in this century. Google combined the latest technology with the power of cloud-based computing to share data and improve the accuracy of machine learning algorithms. Speech recognition system has the edge over other systems as it is more user-friendly and caters to a broader audience (including people with hearing ailments). This is also the reason for the popularity of this system.

The goal of our project was to simulate restaurant-clerk behavior. It must be able to provide information and ask client questions Similarly to how a human clerk does. The earlier dialogue sub-system uses several kinds of knowledge which are represented as frames, rules and class instances. Preliminary researchers used frames to represent client interaction. Each frame represents a class of elements, and is a compound of a slot set. The linguistic knowledge necessary for clients' natural language analysis is represented as syntactic and semantic rules, which are stored in the Output Interface Knowledge Base.

Siri. Amazon's Alexa. Google's Home Hub. Facebook's Portal. Apple's HomePod. Samsung's Bixby. Microsoft's Cortana. Today's assortment of voice assistants and smart speakers have integrated into the lives of everyday people — and the restaurant industry is taking note.

When 72% of smart-speaker owners claim their device is an integral part of their daily routine, restaurant owners and managers have a pivotal opportunity to use voice search to their business' benefit.

II. SPEECH INTERFACE

A. Voice Automated Restaurent System

The primary approach into the development of a restaurant menu speech-interface was attempted in the form of predefined set of Dialogues between users and systems as entities. Frames [9][11] to interpret the client interactions and restrictions, coupled with rules and class instances to address the linguistic natural language analysis while hosting a knowledge base for the items on the menu respectively. The NLG [12] (natural language generator) has two functions – deep generator and surface generator. The former is responsible for generating what to say i.e. context of speech interaction. While latter

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Image based Bird Species Identification using Convolutional Neural Network

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***Abstract* — Life's routine tempo appears to be rapid and energetic and includes diverse tasks. Bird-watching is a popular hobby which offers relaxation in everyday life. Innumerable people visit bird sanctuaries to observe the elegance of different species of birds. To provide birdwatchers with a convenient tool for identifying the birds in their natural habitat, we developed a Deep Learning model to help birders recognize 60 bird species. We implemented this model to extract information from bird images using the Convolutional Neural Network (CNN) algorithm. We gathered a dataset of our own using Microsoft's Bing Image Search API v7. We created an 80:20 random split of the data. The classification accuracy rate of CNN on the training set was observed to be 93.19%. The accuracy on testing set was observed to be 84.91%. The entire experimental research was carried out on Windows 10 Operating System in Atom Editor with TensorFlow library.**

Keywords* — *Deep Learning, CNN Model, Classification and Prediction, TensorFlow, Keras

I. INTRODUCTION

Deep Learning is a Machine Learning subfield which is in turn a subfield of Artificial Intelligence. Deep learning can be visualized as a platform where artificial, human brain-inspired neural networks and algorithms learn from large amounts of data. Deep Learning allows computers to solve complex problems even though they use a very diverse, unstructured, and interconnected data set. The more Deep Learning algorithms learn, the better they perform.

Nowadays, bird species identification is seen as a perplexing problem which often leads to confusion. Birds allow us to search for certain species within the ecosystem as they react rapidly to changes in the atmosphere; but collecting and gathering information on birds needs tremendous human effort. Many people visit bird sanctuaries to look at the birds, while they barely recognize the differences between different species of birds and their characteristics. Understanding such differences between species can increase our knowledge of birds, their ecosystems and their biodiversity. The identification of birds with bare eyes is based solely on the basic characteristics due to observer constraints such as location, distance and equipment, and appropriate classification based on specific characteristics is often found to be tedious. Ornithologists have also faced difficulties in distinguishing bird species. To properly identify a particular bird, they need to have all the specificities of birds, such as their distribution, genetics, breeding climate and environmental impact. A robust system is needed for all these circumstances that can provide processing of large scale bird information and serve as a valuable tool for scholars, researchers and other agencies. The identification of the bird species from the input of sample data therefore plays an important role here.

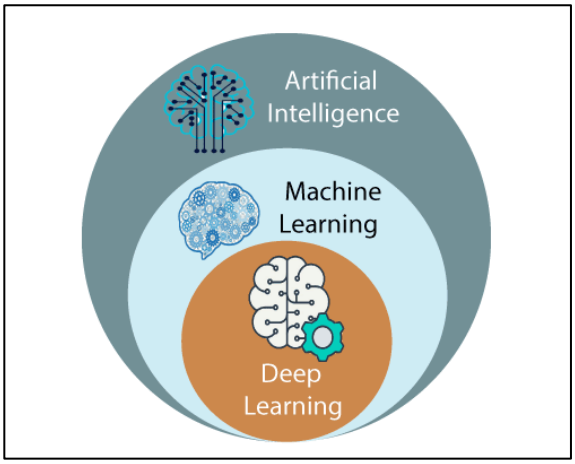

Fig 1: A Venn diagram defining deep learning as a machine learning subfield which is in effect a subfield of artificial intelligence.

Bird identification can generally be done with the images, audio, or video. The audio or video processing technique makes it possible to detect birds by analyzing audio and video signals; however, the processing of such information is made more complicated by mixed sounds such as insects and the presence of other real-world objects in the frame. People are typically more effective at finding images than audios or videos. Therefore, it is easier to use a picture over audio or video to identify birds.

To predict the birds in their natural habitats, we developed an interface to extract information from bird images using the Convolutional Neural Network (CNN) algorithm. First, a vast dataset of birds were gathered and localized. Second, CNN architecture was designed similar to the VGGNet Network. Now that the network was implemented, we trained the CNN model with the bird dataset using Keras, and subsequently the classified, trained data was stored on the disk to identify a target object. Ultimately, the client-server architecture navigates a sample bird image submitted by an end-user to retrieve information and predict the bird species from the qualified model stored on the disk. This method allows the autonomous identification of birds

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Plant The Future using Deep Learning

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***Abstract* - Trees restore our air supply by producing oxygen and absorbing carbon dioxide. The amount of oxygen generated by an acre of trees annually equals the amount of oxygen consumed by 18 people over the year. In cities, the majority of trees are being cut down for the construction of roads and bridges. The vehicle traffic is the root cause for these constructions. As we observe the traffic density of any area in a country is increasing continuously. This continuous growth demands more and more roads and Fly-overs for easier and faster transportation. But these constructions, in turn, demand the cutting down of roadside and/or nearby trees. As we know "Deforestation is the root cause of all the pollution". In these cases, the cutting down of trees becomes mandatory. The roadside trees are most vulnerable to getting cut-down. This aim is used to predict the probability of roadside trees going to be cut down for the construction of roads and flyovers in a given area in the given time-period. The idea is divided into 3 stages. 1. Predicting the traffic density of a given area using Machine Learning techniques. 2. Getting the satellite images of the related area to find the number of trees going to cut down and the amount of oxygen produced by those trees. 3. Finding the suitable empty(government) / nonempty(private) land(s) using Deep Learning to plant the tree saplings suitable for that region. From this, we can plant the number of trees which are going to cut down in the next couple of years so that when they are finally cut down, the oxygen levels can be maintained by the already planted young trees.**

Keywords- Machine Learning; Deep Learning; trees; Satellite Images; traffic density; construction; roads; bridges; deforestation; pollution;

1. INTRODUCTION

Since the beginning, trees have offered us two of life's essentials, food, and oxygen. As we evolved, they granted additional necessities such as shelter, tools, and medicines. Their value continues to increase even today and more benefits of trees are being discovered and discussed as their role expands to satisfy the needs pertaining to our modern lifestyles.

Trees bestow on our environment by providing the most essential element for living beings - oxygen, by improving the air quality, by climate refinement, by conserving water, preserving soil, and supporting many wildlife. During the process of photosynthesis, trees produce the oxygen we breathe and take in carbon dioxide. According to the Department of Agriculture of The United States, "One acre of forest absorbs six tons of carbon dioxide and puts out four tons of oxygen. This is enough to meet the annual needs of 18 people." Trees, shrubs, and turf also purify air by removing dust and absorbing other pollutants like nitrogen dioxide. carbon monoxide and sulfur dioxide. After trees obstruct the unhealthy particles, rain washes them to the ground.

Deforestation is one of the most predominant issues that has received substantial attention in many different disciplines. As shown in previous studies, this phenomenon has a harsh impact on regional hydrology, large-scale climatic systems and long-term climatic systems, global biochemical cycles, and extinction of various animal species. Despite its seriousness, most countries do not have any detailed statistics on the extent of deforestation. In Mexico, authors have reported deforestation rates of 0.3-0.5% per annum. Also, one study estimated the deforestation rate to be about 0.3% and 0.9% per year for the tropical and temperate areas. This study showed that 84,000 sq.km of forest cover were destroyed between 1975 and 2000.

So, ending deforestation is our best chance to solve the extreme climate changes and protect wildlife. Earlier, 30% of India was covered by forests but now it is decreased to 26.5%. The effects of deforestation are already visible in cities like Delhi and Bombay. And due to the rapid urbanization, Bengaluru, Hyderabad, and other densely populated cities are next in line. The decreased levels of oxygen in the environment can lead to thinning of the atmospheric layer thus allowing the greenhouse gases to enter the atmosphere. If this continues to happen each human being requires two oxygen cylinders to breathe every day.

2. LITERATURE SURVEY

Abdalla M. El-Habil [1] in 2012, proposed that the multinomial logistic regression (MLR) model is used for categorical data analysis using a mathematical concept called logit, which is logarithms of odds. It is a statistical method for analysis of a dataset in which there is one independent variable or multiple independent variables that determine the outcome. It is used to predict a binary outcome (True / False ,1 / 0, Yes / No). This method considered 18 explanatory variables that had an influence on physical violence against children, and these are examined by the MLR model to calculate response variables and all explanatory variables related to make the primary model. Then we check the errors for explanatory variables and then we re-calculate the model excluding the error variables and find a new MLR model.

Yann LeCun Et al[2] in 2015, proposed that the Deep Learning technique represents models that consist of multiple processing layers with multiple levels of data abstraction and is used to predict output for a given set of inputs. The most common form of deep learning is supervised learning, which is a deep learning task of interfering with a function from labeled training data. It computes a function to measure the error between output and the desired pattern of scores. Many Deep Learning applications use feedforward neural network architectures. Deep Learning applications use a transfer learning approach,

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Breast Cancer and Prostate Cancer Detection using Classification Algorithms

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***Abstract* - It is a known fact that, cancer rates have increased to great heights in the recent times. The only way to completely cure cancer is to detect its presence at an early stage, for which appropriate diagnosis is available. The main plot of this paper is the detection, and classification of such cancerous cells in the patient's genome expression, on detection of which he/she can be provided rightful treatment. Modern day techniques have evolved that can help to detect the presence of cancer, such as Deep Learning, Artificial Neural Networks, Deep Convolution Networks, and Data Mining etc. In this paper we have dealt mainly with two types of cancer. Breast cancer and Prostate cancer in females and males respectively. We have implemented Machine Learning to find out signs of cancer, and what type of cancer, if seen. The reason being, physicians are capable of diagnosing a patient with cancer, with an accuracy of 71%, according to a latest research, on the other hand Machine Learning techniques can show up to 91% accuracy for rightful classification. Since, the primary focus is to detect and classify the type of cancer in the patient, we have used classification techniques/algorithms under Machine Learning such as Decision Tree (DT), Random Forest (RF), Support Vector Machine (SVM), Logistic Regression (LR) and Naïve Bayes (NB). Effort has been made, to identify the best techniques providing the highest accuracy for both the cancers, and enhancing them with stratified K-fold and dimensionality reduction.**

Keywords: Machine Learning, Classification algorithms, Cancer, Prediction and classification, Naïve Bayes, SVM, Logistic Regression, Random Forest, Decision Tree.

I. INTRODUCTION

Breast cancer affects about 10% of all women, at some or the other stages of their lives, making it the most common cancer, among women. Fig 1, represents the cases and rates of Breast cancer in women based on age. Based on the growth patterns, the expression of oestrogen, progesterone, human epidermal and growth factor receptor, including Ki-67 proliferation index, we can classify the invasive breast cancer into a heterogenous category of disease. The statistics portrays that, the survival rates of breast cancer after 5 years post diagnosis is 88%, and after 10 years post diagnosis is 80%. Breast cancer in men is notably very rare, which accounts to less than 1% of the total breast cancer cases. On the positive side, the early prediction of breast cancer, can increase the survival rate and hence, it has turned out to be the most important step, in this process.

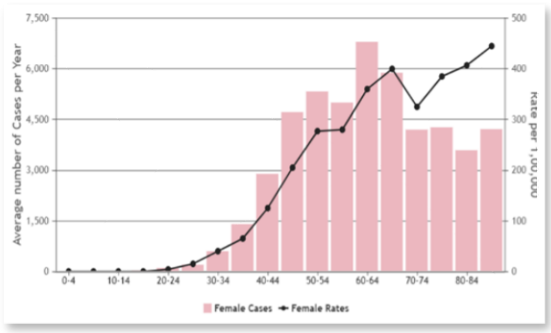

Fig 1: Cases and rates of Breast Cancer in women, based on age

Besides, Prostate cancer affects about 7%, close to 1.3 million men across the globe. Fig 2, represents the rates of Prostate Cancer based on country. Prostate cancer is the next significant cancer in men, after skin cancer, caused in the prostate gland which may lead to death. The rates of prostate cancer have been observed to increase with factors such as, age, sex hormones and steroid hormones. Can Prostate cancer be detected early? Yes, Screening can be used to find out cancers at an early stage, which can help the medical practitioners, to provide a better treatment.

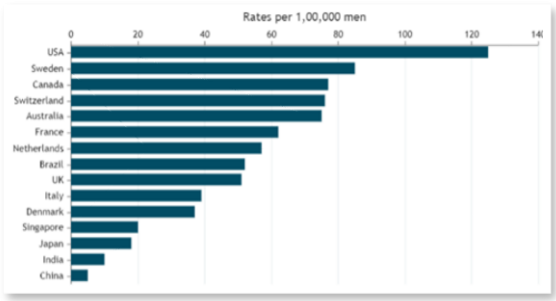

Fig 2: Rates of Prostate Cancer, based on country

Manual techniques for prediction and treatment of the same exists, but Machine Learning can act as a helping hand thereby reducing the number of wrong predictions, i.e., false positive (FP) and false negative (FN) decisions in the generated confusion matrix. Consequently, new methods such as Deep Learning, Artificial Neural Networks, Deep Convolution Networks, and Data Mining have become popular research tools for medical researchers who are trying to predict the outcome of a disease with the help of datasets, by identifying and exploiting patterns and interrelations among various huge number of attributes. The

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Online Attendance using Facial Recognition

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***Abstract* - In the modern world, education system is advancing day-by-day due to the introduction of concept of "smart classroom". However, the attendance system still remains primitive, where the teacher/lecturer calls the name of students to mark their attendance. The automatic attendance management will replace the manual method, which takes a lot of time, that is, it is very time consuming and is difficult to maintain. There are many biometric processes, among which face recognition is the best method. In this project, we are going to describe the attendance without human interference. In this method the camera is fixed within the classroom and it'll capture the image, the faces are detected and then it's recognized with the database and finally the attendance is marked. It also proposes a single image-based face liveness detection method for discriminating 2-D paper masks from the live faces. Still images taken from live faces and 2-D paper masks were found with the differences in terms of shape and detailedness. In order to effectively employ such differences, we exploit frequency and texture information using various algorithms. We will be trying to improve the accuracy to a great extent and thus generate the final attendance report after updation in the database.**

I. INTRODUCTION

A. History

During 1964 and 1965, Bledsoe, alongside Helen Chan and Charles Bisson, worked on using the pc to acknowledge human faces (Bledsoe 1966a,

1966b; Bledsoe and Chan 1965). He was pleased with this work, but because the funding was provided by an unnamed intelligence that didn't allow much publicity, little of the work was published. Based on the available references, it had been revealed that the Bledsoe's initial approach involved the manual marking of varied landmarks on the face like center of the eye, mouth, etc., and these were mathematically rotated by computer to satisfy the pose variation. The distances between landmarks were also automatically computed and compared between images for identification.

Given an outsized database of images (in effect, a book of mug shots) and a photograph, the matter was to pick from the database some set of records such that one among the image records matched the photograph. The success of this method was measured in terms of the ratio of the solution list to the amount of records within the database.

B. Overview

One of the foremost reminiscences everyone has about college is the morning roll call that the lecturers would in person call upon our names, and we tend to reply in affirmation to prove our attendance. It's a long and tedious routine in educational institutions and several people have manipulated the manual attendance system. Attendance being a very important side of administration might usually become a time constraint, repetitive job, loaning itself to inaccuracies. Organizations need to keep a track of individuals inside the organization like staff and students to maximize their performance. Managing student's attendance at lecture periods has become a tough challenge. The ability to work out the attendance proportion becomes a significant task as manual computation produces errors, and wastes a great deal of our time. The basis of developing an automatic attendance management system is to computerize the standard method of taking attendance.

In Face Detection and Recognition Systems, the flow of process starts by being able to detect and recognize frontal faces from an input device, i.e, camera. In today's world, it has been proven that students engage better during lectures only when there is effective classroom control. The need for high level student engagement is very important. Students need to be continuously engaged during lectures and one of the ways is to recognise and address them by their names. Therefore, a system like this may improve classroom control.

Maintaining the attendance is very important in all the institutes for checking the performance of students. Some institutes are taking attendance using the old file or paper based manual approach and a few have adopted methods of automatic attendance using some biometric techniques. But in these methods students have to wait for long time in making a queue at time they enter the class room. Many biometric systems are available but the key authentications are same in all the techniques.

Every biometric system consists of enrolment process during which unique features of an individual is

FOOD CLASSIFICATION AND CALORIE ESTIMATION USING COMPUTER VISION TECHNIQUES

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Abstract: In today's world, the important thing that matters is health. people have become more health-conscious and are careful about their diet. To consume quantified food every day, automatic recognition of the food image helps. As of now, there are no applications that can recognize food and estimate their calories automatically. Our proposed system not only detects varieties of fruits & vegetables but also provides per serving calories of each food detected in a single image. To achieve this, we will take the input of the food image from the user. This food item is detected with the help of the CNN algorithm. In the next step, we do image segmentation with the help of morphological functions of OpenCV. After Segmentation, the Volume of the food is calculated. After this, with the help of formulas calories of the food are calculated.

Keywords: Automatic recognition, Convolution Neural Network, Morphological functions, OpenCV.

I. INTRODUCTION

According to the NIH, obesity is the second leading cause of preventable death. A million people die yearly due to obesity. Nowadays it is very difficult for a person to track the calories consumed by them. The intake of calories plays a very vital role in one's healthy lifestyle. Earlier the users used to track their calorie intake with the help of charts. These methods are very hectic to follow and lead to an unquantified meal diet. Having a meal which is quantified helps you reduce that extra fat. We came up with an idea to help the people track the number of calories that it takes in with the help of simple images of the food that is captured by the user instantly. There are various apps out there available. In those apps, the user has to manually input all the data. Computer vision is also used to estimate the amount of calories present. There are a lot of algorithms available for object detection. Each method has its advantages and disadvantages. In our project, we are using the CNN algorithm.

II. RELATED WORK

S. Jasmine Minija et al. (2017), proposed a method where they pick a stable segmented region from multiple such segmented regions. After all images are segmented, the global and local features area is obtained via feature extraction based on texture, local neighborhood pixel and color. Once classification is performed, calorie value is obtained and an accuracy of 97% was obtained.

Hong Liang et al. (2018), proposed a method where the volume of food is estimated by 3-D reconstructions through depth camera or planar image sequence. Food calorie estimation is done using the Deep-learning approach. Datasets used are Microsoft COCO and Pascal VOC for image recognition. The calorimeter R2 and RMSE are about 0.95 and 43 and MSE is 32. Updating food ingredients information to meet the needs of different users. And gather larger training sets to improve accuracy and speed is aimed in the future.

Shaikh Mohd. Wasif et al. (2019), proposed a method where they have taken an image as input from the user. The image is then passed to faster R-CNN model. After image detection, they performed image segmentation. For image segmentation, they used grab cut algorithm. Segmentation of the image is then performed. For calorie estimation, they calculated the volume of the food item. The volume is then used to calculate the calories present in the food item. All the above modules are then integrated to make the software for calorie estimation using images of the food item. The accuracy obtained is 90%.

Yanchao Liang et al. (2017), proposed a deep learning method. In the dataset, both food volume and mass records are given. To estimate calories, it takes the top view and side view of the food. Every image has a calibration object which will be used to find out the scale factor of the image. Food(s) and calibration objects are detected by the object detection method called Faster R-CNN and each food counter is obtained by applying the Grab Cut algorithm. After that, they estimated each food's volume and calories.

S. Jasmine Minija et al. (2019), proposed an automatic method of food category recognition and calorie estimation using the BFC and IpCA-DBN. For automatic recognition, the features are extracted, for which the optimal segments are offered using the BFC. The features increase the robustness of the recognition, and the method consumes less time, which is applicable for assessing the diet in daily life. Bayesian Fuzzy Clustering (BFC)is the optimal clustering mechanism, and the main role of BFC is to generate the optimal segments from the food image. BFC is characterized using a set of unknown memberships, and prototypes. DBNs are the generative neural networks that consist of the multiple layers of Restricted Boltzmann Machines (RBM) with each layer holding the input and the hidden neurons and the hidden neurons constituting the output layer. Once the food category is recognized using the proposed IpCA-DBN, the calorie of the food is determined. The accuracy obtained is 96%.

Pallavi Kuhad et al. (2015) , proposed a method where the Category of tools is been considered, which uses image processing to recognize single and multiple mixed food objects, namely deep learning and SVM. Finger -based calorie measurement,

Development of Ubiquitous Intelligent System For Sports Centers Using Artificial Neural Network And Machine Learning Approaches.

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Abstract
Due to evolution in the field of sports ,individuals got interested and engaged in it and the requirement for sports center to help those individuals is in demand. Initially there was a single sport center to serve the people and it not enough to meet the increasing experience need. Thus, it was crucial point that service of sports has moved to intellectualization. This paper is structured as, firstly it tells drawbacks of traditional sports service system namely poor sharing of resources, slow transmission of information, poor flexibility of response which effects the induvial experience and growth of sports center services. With increase in the field of computer technology intellectual sports service system is been completed, which leads the subsystem to interconnect, interoperate and integrate the information, it also achieves the goal of resource sharing and function upgradation. By using this intelligent system and big data technology big data platform is built and to realize the prediction of the passenger flow which helps to provide the advance guidance plan, Support Vector Machine-Back Propagation(SVM-BP) neural network composite model is been used. Finally, it tells that with the help of empirical analysis , design of intelligent system is increase the service quality of culture center. This paper concludes with that it not only achieves significant increase in passenger flow but also with efficient way to increase the service sports cultural center which leads to intellectualization.

Keywords
Sports Culture Center, Big Data Technology, Intelligent System, SVM-BP Neural Network, Artificial Neural Network, Soft Computing

1. Introduction

With opening of sports and culture center, people who is having interest can make some time for sports and exercise through pre-booking or on-site booking thus gives them physical and mental relaxation ,which helps them to work and learn simultaneously. With increase in the standard of leaving style of people, traditional sport culture center service system is not enough to meet its requirements of people participation in sports [1] [2]. With the increase in the construction of sports culture service system has attracted people with keen interested in sports.
Intelligent service system has helped in monitoring, security, intelligent communication, mechanical equipment, live broadcast system scoring system, which effectively solves the problems like uneven distribution of space in cultural center, on time staff service, unreasonable real time pricing, etc., to make sure that it is operating and serving the people in need properly thus balancing its profit and loss [3].

Liang H T provide a design [4] for intelligent stadium system which provides an efficient and economic benefits for intelligent system by using the functionality of Internet Of Things(IOT) technology, thus fulfill the aim at designing the intelligent system for sports culture centers. By studying the power supply facilities in sports culture center Tian L and others [5] has designed new type of solar automatic lighting system, thus sports center culture system utilize sunlight at daytime and stores solar energy for lightning at night. The above design system uses renewable source of energy that is solar energy it is stable improvement in the construction of sports culture center. Research by Xiao Y H and others [6] on intelligent lightning control system for sports culture centre helped to take measures in lightning design, selection of lamp type and installation process to solve the glare problem.

CFD numerical simulation technology is been used to study the mechanical evacuation system, mechanical air supply system etc. which is basis for design of exhaust system by Fu Q et al. [7]. M. Nishioka T [8] and others have

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IMU BASED SMARTPHONE CONTROLLED HUMAN FOLLOWING ROBOT WITH FALL DETECTION

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***Abstract*— The advancement in robotic technology has improved drastically in the past decade, from load carrying to assembling of huge aircrafts has made it easier and has reduced human labour. Furthermore, with technologies like Artificial Intelligence and Machine Learning becoming pervasive robots are tending to grow smarter. Human following robots employing RFID and vision techniques like camera and laser are current trend in the market. But they all are mainly based on line of sight which implies that it cannot reacquire the target when lost. In this paper, a novel method is employed to obtain the human following feature using Inertial Measurement Unit (IMU). Unlike the former techniques, using IMU would not pose any shortcomings of losing the target. The most important feature needed is the ability for the robot to follow that particular person. The application called the Hyper IMU is utilised to convert a regular Smartphone into a powerful IMU device. The availability of the sensors which are already embedded in the Smartphone these days is highly advantageous for the implementation of human following robot. The robot tracks the movement of the human and heads in the same direction as guided by the sensors. The implementation of ultrasonic sensor is to obtain obstacle detection which can avoid damages to the robot in case of its absence.**

Keywords— **IMU, Ultrasonic sensor, HyperIMU, Smartphone, GSM, Fall Detection**

I. INTRODUCTION

Every time the robot gets advanced, the usefulness of it increases tremendously. Krueger V., et al.(2016) have emphasized in their work that Robotic technology has advanced appreciably in the recent years. The reason being their increased efficiency and practical ability to work. However, these robots have only found their existence in industries and smart human friendly robots for general purpose use have yet to be achieved. To realize this, interactions between these robots and the environment should be more autonomous rather than programmed to do a couple of tasks. Pradeep B. V et al.(2017) have openly stated in their paper that communication is an important aspect for this purpose and also in the design and development of human friendly robots. Closer the both, easier is this interaction. As stated by Marina Md. Din et al.(2018) although there are outdoor localization techniques such as GPS and GLONASS, they are not the best solutions to carry out target following feature. This limitation occurs due to the fact that these signals have low penetration capability through walls of buildings and other structures. Since a large time of our day is spent indoors, a better alternative to cater this problem is much required. Hence, as concluded by Suresh kumar R. et al.(2018) in their work a viable indoor tracking technique which is also easily affordable is required. Since Smartphones are ubiquitous and there is no one person who lives without using it. Therefore, in this proposed project we have considered it to be the best resource that can be tapped to comfort the problem.

Fall Detection

Honig S. S. et al(2018) and Ren L., et al.(2019), the authors from both the papers have admitted that it is a major challenge in the public healthcare domain, especially for the elderly person as the decline of their physical fitness, and timely and reliable surveillance is necessary to mitigate the negative effects of falls. According to the study conducted by Hu J.-S., et al.(2014) the Human Following Robot can monitor the movements of human body and recognize a fall from normal daily activities. From the Smartphone application, the IMU coordinates can be read and the robot can be programmed to alert the emergency contact number which will be pre-installed Decker, M., et al.(2017) and Fukuda T et al.(2011) .

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

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Design and Development of AC Windings Calculation using MATLAB Software

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Abstract

There are many problems in electrical engineering which are quite difficult to solve in short span of time especially the problems which have iterations and also it is difficult to verify whether the solution obtained is right or wrong. One similar problem is Electrical drawing Calculations. The electrical windings both ac and dc are of several types. In each type of winding the calculations used are different and also the windings will have several slots and layers which increase the complexity of the problem and also affects of the accuracy of the solutions obtained manually. In this paper the MATLAB programs are implemented to get the solutions of various AC windings in electrical engineering which is complex in nature when solved manually. The user can enter the basic details of the AC windings and able to get the solution through which the drawing can be done directly without any manual calculations and also this paper provides a powerful tool for verification of solutions obtained theoretically.

Key Words: AC Windings, Electrical Machines, Winding design Calculation, MATLAB programs

1. Introduction

An Electrical Engineer can analyze and design electrical equipments like transformers, DC machines, induction machines, synchronous machines etc. The drawings are the only means of communication through which the ideas of design engineer are transformed into reality which is helpful to the society. Based on design information and specifications, engineering drawings are to be made. The drawing is an essential bridge between designer and manufacturer and also between the designer and commissioning/maintenance engineer. The manufacturer plans the details of processing, machining, material requirement and cost estimate, based on the drawing. But to design electrical equipment it is very essential for designer to analyze and do the calculations for the given specifications. This calculation needs a numerical resolution of a given details of winding diagram, transformer, DC/AC machines etc. In the perspective of designers many software have been developed to solve magnetic field problems on electrical rotating machines, basing on finite element methods (FEM). Unfortunately, not much software deals with windings and their design. [4]

Unfortunately, though giving accurate results, FEMs have some drawbacks like:

1) The need the exact geometrical data (not always known at initial design stages) in form of CAD drawings.

2) They are time consuming, due to the necessity to carry out many calculation sessions each time one or more machine parameters are changed.

3) Each calculation session can last even for a long time, depending on the expected accuracy. [3]

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DEVELOPMENT OF MATLAB SOFTWARE FOR VARIOUS TESTING PARAMETERS' CALCULATION OF STATIC AND ROTATING MACHINES

K. MAHESH ; J. LITHESH ; S. INBASAKARAN

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Abstract

Electrical machines are the back bone of electrical engineering and play a vital role in the industry. For the higher rating values, which cannot be practically supplied to the machine, through this program one can observe the results for high rating and also machines with different specifications. To obtain different internal and external characteristics of machines in the lab, systematic results and graph can be obtained using these MATLAB programs. Electrical Machines can be analyzed for any values for the

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Streaming Video Quality Assessment in Digital TV Streams under No-Reference Conditions

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Abstract:
Assessment of Video (Image) quality has always been a subject of great concern for people engaged in Entertainment Photography, Digital Television, Medical Imaging, Astronomical Imaging etc. The visual quality can have a tremendous amount of impact on the application at hand and establishing reliable methods to assess quality is of paramount importance. While quality assessment in the presence of reference images is an established discipline in the domain of Image Processing, such an assessment in the absence of reference is an extremely difficult task and remains an esoteric subject even today. In this paper, we research and formulate a fairly reliable mechanism of assessing perceptual video quality under no-reference conditions.

Keywords*: Perceptual Quality, Peak-Signal-To-Noise-Ratio, Kurtosis, Invariant Moments, Mean & Std. Deviation, Variance, Quality Index, Blockiness, Fourier Transform. Cosine Transform.*

Introduction:

Assessment of Video (Image) quality has always been a subject of great concern for people soaked in Entertainment Photography, Digital Television, Medical Imaging, Astronomical Imaging etc. Although the topic of image quality assessment has been around for more than four decades, there has, until recently, been relatively little published on the topic. Certainly this omission is not for lack of need or paucity of interest, since most image-processing algorithms and devices are, in fact, devoted to maintaining or improving the apparent quality of digitized images for human visual consumption. Traditionally, image quality has been evaluated by human subjects. This method, though reliable, is expensive and too slow for real-world applications. So this presentation is about *objective* image quality assessment, where the goal is to provide computational models that can automatically predict perceptual image quality. Perhaps the first notable

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UPGRADING OF POWER QUALITY BY USING TCR & SHPF

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ABSTRACT - This project proposes a combined system of a Thyristror-controlled reactor (TCR) and a shunt hybrid power filter (SHPF) for harmonic and reactive power compensation. The SHPF is the combination of a small-rating active power filter (APF) and a fifth-harmonic-tuned *LC* passive filter. The tuned passive filter and the TCR form a shunt passive filter (SPF) to compensate reactive power. The small-rating APF is used to improve the filtering characteristics of SPF and to suppress the possibility of resonance between the SPF and line inductances. The simulation and experimental results are found to be quite satisfactory to mitigate harmonic distortions and reactive power compensation.

KEYWORDS*: Active filter, passive filters, tcr, reactive power compensation, simulation.*

I. INTRODUCTION

Now a day's electric power supply distribution systems, there is a sharp rise in the use of single phase and three-phase non-linear loads such as computer power supplies, commercial lighting, rectifier equipment in telecommunication networks, domestic equipment's like TVs, ovens, adjustable speed drives (ASD) and asynchronous ac–dc links as in wind, and wave electric power generation systems. These non-linear loads generally have solid state control of electric power and draw non-sinusoidal unbalanced currents from ac mains resulting in harmonic injection, reactive power burden, and unstable loading.

Further, they cause poor power factor, low efficiency, neutral conductor bursting and interference with nearby communication networks. Conventionally passive L-C filters were used to reduce harmonics, and power capacitors were employed to improve the power factor of the ac mains, but they have the limitations of fixed compensation characteristics and large size, and can also excite resonance conditions. Recently the use of active filters and hybrid filters for power quality improvements is on the rise.

A new combination of a shunt hybrid power filter SHPF and a TCR is proposed to suppress current harmonics and compensate the reactive power generated from the load. The hybrid filter consists of a series connection of a small-rated active filter and a fifth-tuned *LC* passive filter. In the proposed topology, the major part of the compensation is supported by the passive filter and the TCR while the APF is meant to improve the filtering characteristics and damps the resonance, which can occur between the passive filter, the TCR, and the source impedance.

The shunt APF when used alone suffers from the high kilovolt ampere rating of the inverter, which requires a lot of energy stored at high dc-link voltage, the standard hybrid power filter is unable to compensate the reactive power because of the behavior of the passive filter. Hence, the proposed combination of SHPF and TCR compensates for unwanted reactive power and harmonic currents. In addition, it reduces significantly the volt-ampere rating of the APF part. The control method of the combined compensator is presented. A control technique is proposed to improve the dynamic response and decrease the steady-state error of the TCR. It consists of a PI controller and a lookup table to extract the required firing angle to compensate a reactive power consumed by the load.

II. PROBLEMS FROM HARMONICS, REACTIVE POWER AND NEED OF COMPENSATION

Power system problems related to harmonics are rare but it is possible for a number of undesirable effects to occur. High levels of harmonic distortion can cause such effects as increased transformer, capacitor, motor or generator heating, failure of electronic equipment relies on zero voltage crossing detection or is sensitive to wave shape, incorrect readings on meters, malfunction of protective relays, interference with telephone circuits, etc. The likelihood of such abnormal effects greatly increases on resonant condition occurs. Resonance occurs when a harmonic frequency produced by a non-linear load closely coincides with a power system

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AN Effective PHR Based Secure Data Distribution using KC-ABE in Cloud Environment

Sangeetha.M, P.VijayaKarthik, Sivanesh Kumar. A

Abstract ***The objective of the research work is focused on cloud computing which is a developing design to give secure change among continuous applications. Secure information sharing is characterized as transmission of at least one documents profitably this procedure is utilized to share data's, characteristics, records among different clients and associations in secure mode and verifies from outsider clients. Usually it is finished by encryption and unscrambling process over private system. This kind of information sharing is finished by new innovation of key cipher text KC-ABE. It can give secure record transmission by having confined access innovation. This developing procedure has been checked in tolerant individual wellbeing record upkeep. These documents are recorded and recovered safely without access by unapproved clients. KC-ABE encryption framework is material to produce for adaptable and secure sharing of information's in distributed computing, which will reinforcement persistent wellbeing creating records in increasingly defensive manner. In KC-ABE strategy, the subtleties of patient are put away in KC-ABE server farm. In KC-ABE, Key backer just legitimize the entrance control and can't issue by the encryption. Along these lines the relating tolerant just reserve the options to get to this KC-ABE innovation. It gives more secure information sharing than other encryption framework. The fundamental utilization of this technique are High key age time and encryption time. It can accomplish less encryption time and key age time to improve productivity of KC-ABE.***

Keywords: KC-ABE, key issuer, Public key, cipher text, master key analysis.

I. INTRODUCTION

In the era of cloud computing, to shield information from spilling, clients need to encode their information before being shared. Access control is vital as it is the principal line of safeguard that avoids unapproved access to the mutual information. With the thriving of system innovation and versatile terminal, online information sharing has turned into another "pet, for example, Facebook, MySpace, and Badoo[1]. Similarly cloud is one of the most encouraging application stages to fathom the unstable growing of information sharing. In distributed computing, to shield information from spilling, clients need to scramble their information before being shared.

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Access control is central that counteracts unapproved access to the mutual information. As of late, characteristic based encryption (ABE) has been pulled in considerably more considerations since it can keep information security and acknowledge fine-grained [2], one-to many, and non-intelligent access control. Cipher text-approach quality based encryption (CPABE) is one of doable plans which has substantially more adaptability and is more reasonable for general applications.

In distributed computing, authority acknowledges the client enlistment and makes a few parameters. Cloud service supplier (CSP) is the administrator of cloud servers and gives different administrations to customer. Information proprietor encodes and transfers the created cipher text to CSP [3, 4]. Client downloads and unscrambles the intrigued cipher text from CSP In existing system techniques are built using many encryption approaches like Attribute Based Encryption etc. If we maintain the data in cloud data Centre, it is so absolutely secured. Health and medical records are so complex. It needs more secure system to product from third parties. Otherwise it leads many illegal activities [5]. The existing system of using ABE in cloud computing is done by encrypt data using keys and attributes. Through internet anyone can download the details of patient. To avoid this drawback ABE technology is used to protect data by matching access user attributes with defined attributes [6]. If the scenario is matched only it will be accepted to access the data. That is, it is concluded that person is only the authorized user. Otherwise it will be rejected to access the data of health records.

Client downloads and unscrambles the intrigued cipher text from CSP. The common documents for the most part have progressive structure. That is, a gathering of documents are partitioned into various progression subgroups situated at various access levels. If the records in the equivalent various leveled structure could-based encoded by a coordinated access structure, the capacity cost of cipher text and time cost of encryption could be spared. distributed computing, a patient partitions his PHR [7] data M into two sections individual data m1 that may contain the patient's name, government disability number, phone number place of residence, and so forth. The medicinal record m2 which doesn't contain touchy individual data, for example, therapeutic test outcomes, treatment conventions, and activity notes. At that point the patient receives CPABE plan to encode the data m1 and m2 [8] by various access strategies dependent on the genuine need.

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Sketchai: using FCNS to Extract Line ART Drawings

Raghav Jadia, Siddharth Sampat, Ritika Pandey, Manohar R, Supriya P.

Abstract: ***The digital revolution has improved every field of human lives. And field of ART is no exception. The rapid development of modern technology and techniques has made an impact on the work of painters, sketch artists and even comic book writers. One would be hard pressed to find artists in this day and age who haven't heard of modern tools and applications such as Adobe Photoshop, GIMP, etc. But though these applications have undoubtedly made the lives of artists better, the use of AI for art is still at a nascent stage. The current work aims at developing a web-based application called SketchAI which uses Artificial Intelligence to simplify rough sketches or art work and extract the simplified line drawing. Fully Convolution Networks or FCNs are used to automate the task of sketch simplification. Dataset of rough sketches and corresponding line art drawings are used to train the system to extract line art. Different parameters such as number of epochs, loss functions etc. are considered for experimentation along with different subsets and augmentations of the data. Finally, comparisons of different methods are done to integrate deep learning models with a web application.***

Keywords: Line Art Extraction, Sketch Simplification, Sketch Shading, Fcn

I. INTRODUCTION

SketchAI is a web-based tool that aims to use AI to help make the life of artists easier by automating certain tasks. SketchAI uses Deep Learning to automate the task of line art extraction and sketch simplification. Every artist first draws a rough sketch to express his ideas and design rather than focusing on fine details. Using the rough sketch, artists physically trace the jagged draft to create a smooth drawing. But, it's a wearisome and prolonged method. Thus, the system uses a Fully Convolutional Networks to try and automate the task of Line Art Extraction.

Sketch AI system performs the following tasks:

1. Sketch Simplification: Rough raster sketches such as pencil sketches are taken and fully clean drawing can be obtained by using Fully Convolutional Network which is a completely automated process.
2. Comic Colorization: Colorized comic books are often more visually appealing than non-colored ones, and with the advent of digital distribution methods, color printing costs aren't an issue. But actual colorization requires skilled artist. A tool for automatic comic colorization will therefore be highly helpful for comic writers.
   The system automate a subset of this task, specifically, colorization of individual characters, using a type of neural network known as Generative Adversarial Networks or GAN.
3. Sketch Shading: The task of shading a picture after drawing it is a hard and cumbersome one. The system uses GAN for the task of auto shading of cartoon characters.
4. Landscape Generation: Creating beautiful paintings of landscapes or scenery such as beaches, forests, mountains etc. is something which artists have been doing since time immemorial. The SketchAI tool designed uses GANs to help you automatically generate landscape images of mountains based on doodles.

II. RELATED WORK

Edge detection is one of the research areas where most researchers are contributing on. Many researchers have proposed Edge detectors such as Canny Edge Detector [5] which uses multi stage algorithm that can detect edges in images, and Laplacian of Gaussians (LoG) which is used to detect edges as well as any noise in the image. But, these detectors rely heavily on the gradients and thus some of the high contrast black and white images create confusions during edge detection. The authors of [4] and [3] have made an attempt to detect boundaries in natural images. However, these detectors are designed to detect the complete structure of objects and hence do not perform well in extracting fine structural lines.

For extraction of structural lines, [1] proposes a method using manga which is based on FCNs with skip connections. Adoption of this technique is limited since the method uses CNN structure and training data is composed of manga image which are mostly black & white images with high screen tones. However, on the other hand most of the rough sketches have very low screen tones. Edgar Simo Serra et.al, [2] have proposed CNN-based sketch simplification. Accordingly, this involves creation of a network structure to train the dataset which is intended to simplify the sketch. The system designed in this paper is built upon FCN network structure.

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AN Effective PHR Based Secure Data Distribution using KC-ABE in Cloud Environment

Sangeetha.M, P.VijayaKarthik, Sivanesh Kumar. A

Abstract ***The objective of the research work is focused on cloud computing which is a developing design to give secure change among continuous applications. Secure information sharing is characterized as transmission of at least one documents profitably this procedure is utilized to share data's, characteristics, records among different clients and associations in secure mode and verifies from outsider clients. Usually it is finished by encryption and unscrambling process over private system. This kind of information sharing is finished by new innovation of key cipher text KC-ABE. It can give secure record transmission by having confined access innovation. This developing procedure has been checked in tolerant individual wellbeing record upkeep. These documents are recorded and recovered safely without access by unapproved clients. KC-ABE encryption framework is material to produce for adaptable and secure sharing of information's in distributed computing, which will reinforcement persistent wellbeing creating records in increasingly defensive manner. In KC-ABE strategy, the subtleties of patient are put away in KC-ABE server farm. In KC-ABE, Key backer just legitimize the entrance control and can't issue by the encryption. Along these lines the relating tolerant just reserve the options to get to this KC-ABE innovation. It gives more secure information sharing than other encryption framework. The fundamental utilization of this technique are High key age time and encryption time. It can accomplish less encryption time and key age time to improve productivity of KC-ABE.***

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I. INTRODUCTION

In the era of cloud computing, to shield information from spilling, clients need to encode their information before being shared. Access control is vital as it is the principal line of safeguard that avoids unapproved access to the mutual information. With the thriving of system innovation and versatile terminal, online information sharing has turned into another "pet, for example, Facebook, MySpace, and Badoo[1]. Similarly cloud is one of the most encouraging application stages to fathom the unstable growing of information sharing. In distributed computing, to shield information from spilling, clients need to scramble their information before being shared.

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Access control is central that counteracts unapproved access to the mutual information. As of late, characteristic based encryption (ABE) has been pulled in considerably more considerations since it can keep information security and acknowledge fine-grained [2], one-to many, and non-intelligent access control. Cipher text-approach quality based encryption (CPABE) is one of doable plans which has substantially more adaptability and is more reasonable for general applications.

In distributed computing, authority acknowledges the client enlistment and makes a few parameters. Cloud service supplier (CSP) is the administrator of cloud servers and gives different administrations to customer. Information proprietor encodes and transfers the created cipher text to CSP [3, 4]. Client downloads and unscrambles the intrigued cipher text from CSP In existing system techniques are built using many encryption approaches like Attribute Based Encryption etc. If we maintain the data in cloud data Centre, it is so absolutely secured. Health and medical records are so complex. It needs more secure system to product from third parties. Otherwise it leads many illegal activities [5]. The existing system of using ABE in cloud computing is done by encrypt data using keys and attributes. Through internet anyone can download the details of patient. To avoid this drawback ABE technology is used to protect data by matching access user attributes with defined attributes [6]. If the scenario is matched only it will be accepted to access the data. That is, it is concluded that person is only the authorized user. Otherwise it will be rejected to access the data of health records.

Client downloads and unscrambles the intrigued cipher text from CSP. The common documents for the most part have progressive structure. That is, a gathering of documents are partitioned into various progression subgroups situated at various access levels. If the records in the equivalent various leveled structure could-based encoded by a coordinated access structure, the capacity cost of cipher text and time cost of encryption could be spared. distributed computing, a patient partitions his PHR [7] data M into two sections individual data m1 that may contain the patient's name, government disability number, phone number place of residence, and so forth. The medicinal record m2 which doesn't contain touchy individual data, for example, therapeutic test outcomes, treatment conventions, and activity notes. At that point the patient receives CPABE plan to encode the data m1 and m2 [8] by various access strategies dependent on the genuine need.

An Efficient Big Data Analytics based Cloud System for Optimizing Web Page Discovery Techniques

S.Dhanasekaran, P.Vijayakarthik, A.Sivanesh kumar, B.S.Murugan, V.Vasudevan

Abstract

In recent days Internet plays vital role for many purpose such as sharing of information, Academic related activities, searching about meticulous topics and also for the customer entertainment. This system is planned to develop a search engine to assist the clients for discovering relevant web page from large amount of database. This web page searching system provides most relevant top ten results to the clients. By using this type of searching techniques user have to easily find the suitable information that they are looking for. In this research work big data analytics based navigation strategy is introduced in addition to cloud based computing. With the help of cloud computing technique the search engine can be able collect more information and at the same time information can be able to share to any part of the world. The big data analytics concept will be used to store infinite information in database. This will assist the client to discover most related search item.

Detection of 3 – Dimensional Superficial Landmarks by using Deep Neural Networks

Shagun Gupta, Shubham Mahajan, Anil Kumar Bhardwaj, CH. Vanipriya, Amit Kant Pandit

Abstract

Different functions are developed for superficial research to help acknowledgment of individual qualities, examination of race, individual confirmation for security business and another research fields. Accordingly, it's conceivable to distinguish the distinctions fit as a fiddle dependent on spot of nation and birth. Present examination dissects superficial shape utilizing checked three dimensional superficial pictures and researches approaches to remove superficial tourist spots from the three-dimensional superficial pictures. The location of the superficial milestone requires standardization of superficial scale and position in three-dimensional picture information to break down the superficial shape. In this manner, it's hard getting exact superficial milestones from three dimensional superficial pictures. Our technique breaks down the undertaking into the accompanying three sections: (a) transformation of information from the three-dimensional superficial picture to a two-dimensional picture, (b) extraction of superficial milestones from the three-dimensional picture utilizing Convolutional Neural Network (CNN) (c) reversal of distinguished superficial tourist spots two dimensional to three dimensional pictures. In tests, analyzes the exactness of superficial milestone recognition model.

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Design of 12-Bit SAR ADC using Split Capacitor Based DAC Architecture at 45nm CMOS Technology

Naveen I .G, Savita sonoli

Abstract*: Nowadays, there is an increasing demand for Successive Approximation Register (SAR) based Analog to Digital Converter (ADC) in long battery applications like medical application, Sensors and many more. In this paper DAC circuit is designed using multiple capacitor and Multiple MUX for switching. A split based capacitor is used for boosting the speed of the architecture. In split based DAC no common mode voltage required and dynamic offset can be removed as well. In this work, 12-Bit DAC and encoder is designed using 2 Transistor MUX and 18 Transistor Full adders (12B-2TM-18TFA). 2T and 18T is used to design the MUX and FA. This entire architecture is implemented in Cadence Virtuoso 45nm CMOS technology. Simultaneously, 10B-12TM-36TFA architecture also implemented in this paper. The performance parameters like area, power, and delay, current is evaluated for both architectures. Result showed that 12B-2TM-18TFA architecture consumed less area, less power, less delay, and less current compared to 10B-12TM-36TFA.

Keywords : Analog to Digital Convertor, Digital Analog Converter, Successive Approximation Register, 18T MUX, 2T MUX.

I. INTRODUCTION

SAR - ADC have become more preferred design for many low power VLSI applications in which design of capacitor based DAC play a very vital role. Analog and mixed circuit designs are too difficult to work under low voltages [1-2]. Normally, SAR-ADC is not preferred for high bandwidth applications, because it requires more clock cycle to obtain the N resolution (bit) [3]. In recent years, different techniques have been designed to lower the switching energy of capacitive DAC array [4-5] For example, Vcm based [6], switchback scheme [7], and Zhu [8] these achieve an average speed and average power of the entire design. Conventionally, Counter based digital control design [9], Capacitor switching technique [10], split capacitor DAC [11-12], histogram based [13] methods have been used earlier. But, each and every methodology have some limitation like oldest technology (180nm,90nm,65nm), require more area, consume more power (in mW), high current (mA), less resolution (less than 8-bit), architecture occupies more critical path and more number of transistors require to design the internal blocks. To overcome these problems, 12B-2TM-18TFA design is implemented in this paper. This work is implemented on 45nm CMOS technology. Compared to existing architecture (10B-2TM-36TFA), 12B-2TM-18TFA architecture gives less area, power, delay and speed at higher resolution.

This research work is composed as follows, section 2 gives a literature survey of papers from earlier research works. The section 3 explained the proposed methodology with internal block of the entire design. The section 4 presents a brief discussion about the experimental setup and schematic outputs. The conclusion of this research work is given in section 5.

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II. LITERATURE SURVEY

Xing *et al.* [14] proposed a 7-bit MS/s four-way time interleaved SAR ADC. In this paper, a partial Vcm based switching technique was implemented that requires a digital overhead from the SAR controller and achieved better conversion accuracy. This methodology has reduced the common mode variation by 50%. Reduction of noise, comparator offset and input parasitic was analyzed and verified by simulation. In this research work, the prototype fabricated in the 65nm technology, which occupies 0.025 mm^2 of active area. But, the usage of the external common mode voltage during DAC reset could be a problem with this technique. Large switching power and more area is required to run the entire architecture.

Zhang *et al.* [15] presented a 14-bit kS/s SAR-ADC used for biomedical application. In order to achieve enhanced linearity, a uniform geometry non-binary weighted capacitive DAC was implemented. Furthermore, in this method, a secondary bit method was used in dynamically shift decision levels for error correction. This method was implemented in 65nm CMOS technology. The ADC has consumed 1.98 µW Power and $0.28mm^2$ of active area. This Architecture requires number of stages to implement that increases complexity of the ADC.

Mao W, Y et al. [16] implemented Non-Fractional Binary Weighted Capacitive Array with Attenuation (NFBWA) capacitor method for SAR ADC. The proposed DAC method has improved the Walden Figure-of- Merit performance by 1.67 and 5.45 times. This method minimized the area and power of the capacitive array compared to Binary Weighted Attenuation (BWA) technique. The operation of the NFBWA method requires more time, which is the main limitation of this method.

Shakibaee et al. [17] proposed a power-efficient SAR ADC system.

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THE CONCEPTS OF *DEŚĀNTARA* AND *YOJANA* IN INDIAN ASTRONOMY

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Abstract: In this paper we discuss in detail the concepts of (i) the *deśāntara* correction to the mean longitude of a heavenly body, and (ii) the linear distance, called *yojana*. We consider the definitions and procedures given in classical Indian astronomical texts like the *Ārybhaṭīyam*, *Brāhmasphuṭasiddhānta*, *Khaṇḍakhādyaka*, *Laghu- Mahā-Bhāskarīya*, *Siddhānta Śiromaṇi*, *Grahalāghavam* and *Tantrasaṅgraha*. From our findings we notice that there were apparently two distinct schools (*paksas*), which were led by Ārybhaṭa (b. CE 476) and Brahmagupta (ca. 628), who used 1050 and 1581 *yojana*, respectively, for the diameter of the Earth.

Keywords: Indian astronomy, deśāntara, *yojana*

1 INTRODUCTION

Since the Earth rotates about its own axis from west to east sunrise takes place earlier for places with eastern longitudes and later for those with western longitudes. In classical Indian astronomical texts, the time during a day was reckoned from the instant of local sunrise. But the procedures for the computation of the mean positions of the heavenly bodies were given in the texts with reference to the mean sunrise for the prime meridian of Ujjayinī (in present-day Madhya Pradesh). The meridian through Ujjayinī was assumed to pass through a few more important places, like Kurukṣetra, and intersect the terrestrial equator at Laṅkā.

Therefore while computing the mean positions of the heavenly bodies for a given local time at a given place a correction, called the *deśāntara saṃskāra*, had to be applied to account for the longitudinal difference between that place and Ujjayinī. The computation of the *deśāntara* correction needed the longitudinal difference between the given place and the prime meridian through Ujjayinī. In the classical texts this distance was expressed in terms of the linear difference between the two places. For this purpose, the Earth's circumference in *yojanas* was required. At that time, there were two main schools (*pakṣas*), and they took the Earth's circumference to be about 3300 *yojanas* and 4800 *yojanas* respectively

2 THE *DEŚĀNTARA* ACCORDING TO DIFFERENT TEXTS

In Indian astronomy linear distances were measured in *yojanas*. In Figure 1 *PQAC* is the prime meridian through Ujjayinī. *PDBQ* is the meridian

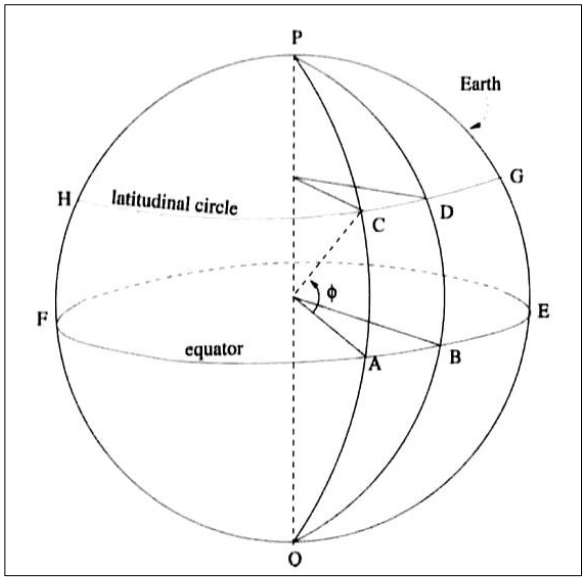

Figure 1: The longitude and latitude lines of a given place (diagram: Padmaja Venugopal).

Correlation among hydrophobic aromatic and aliphatic residues in the six enzyme classes

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Abstract: Hydrophobic force as one of the fundamental forces contributes in folding of the primary sequence of amino acids into a functional three dimensional protein structure. Hydrophobic interactions of side-chains provide maximum stability to correctly folded proteins. Earlier, the authors identified the aromatic and aliphatic residues contributing maximum and minimum hydrophobicity in all the six enzyme classes. The present investigation examines the relative contributions towards hydrophobicity of the different hydrophobic amino acids in both aromatic and aliphatic categories. Notably in a sequence, inverse relationship between residues of similar hydrophobic strength both in aromatic and aliphatic categories seems to exist. This analysis is likely to provide insight for finer analysis of the enzyme molecule.

Keywords: hydrophobicity scale; enzymes; correlation between hydrophobic residues; residual plot; inverse relation.

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MEDICINAL CHEMISTRY RESEARCH

ORIGINAL RESEARCH

Discovery of anti-influenza nucleoside triphosphates targeting the catalytic site of A/PR/8/34/H1N1 polymerase

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Abstract

In an effort to develop potent anti-influenza drugs that inhibit the activity of influenza virus RNA-dependent RNA polymerase (IAV RdRp), a database of nucleoside triphosphates with ~800 molecules were docked with the homology model of IAV RdRp from A/PR/8/34/H1N1 strain. Out of top 12 molecules that bind with higher affinities to the catalytic site of IAV RdRp above and below the PB1 priming loop, only seven molecules decreased the transcriptional activity of the viral RNA polymerase with an IC_{50} in the range of 0.09–3.58 μM. Molecular docking combining with experimental study indicated that the molecules with linear chain are more effective in inhibiting IAV RdRp replication than the molecules with V-shaped and are cyclic in nature. A correlation between ΔG and $LogIC_{50}$ for these seven compounds resulted an R^2 value of 0.73. Overall, these newly developed seven nucleoside triphosphates lay a strong foundation for the future development of a new therapeutics that can satisfy the Lipinski's rule of five exhibiting high specificity to the catalytic site of influenza-A viruses.

Keywords RNA-dependent RNA polymerase · Catalytic site · Docking · Nucleoside triphosphates

Introduction

Influenza is a highly contagious airborne life-threatening viral infection causing recurrent outbreaks of humans responsible for respiratory diseases and death. It was estimated during 2017–2018 that there were 959,000 hospitalizations and 79,400 deaths (CDC 2018) alone in the United States related to influenza illness. Moreover, WHO estimates that 3–5 million people suffer from the disease every year with death rate ranging between 290,000 and 650,000 due to influenza epidemics (Influenza (Seasonal) 2018) worldwide (Sherman et al. 2019). Of note, previous epidemiological studies on pandemic A/H1N1 during the year 2009 clearly showed that the severity of influenza was not so high in individuals effected with HIV compared with HIV-negative patients (Martinez et al. 2011; Perez et al. 2010). This clearly shows that influenza remains a major target for vaccine and antiviral treatment and prophylaxis. One of the causes of the severity of the disease is due to influenza replication and transcription played by viral RNA-dependent RNA polymerase (RdRp) which is composed of three subunits i.e., polymerase basic1 (PB1), polymerase basic 2 (PB2), and polymerase acidic (PA) (Fodor 2013; Resa-Infante et al. 2011). Both PB1 and the N-terminus of PB2 form a large central cavity for catalytic mechanism of influenza-A virus (IAV) viral replication (Hengrung et al. 2015; Pflug et al. 2014; Reich et al. 2014). The priming loop of (a β-hairpin structure) PB1 thumb domain protrudes into the central cavity and supports the sugar base of the first NTP during de nova initiation (Reich et al. 2014; Appleby et al. 2015; Butcher et al. 2001; Tao et al. 2002). Moreover, primer-independent replication on the viral RNA (vRNA) template was also initiated by the priming loop (Te Velthuis et al. 2016). However, no drug exits presently in the market that blocks the entry of putative NTP and inhibits the initiation of vRNA priming loop occupying to the catalytic site of IAV RdRp. Apart from the catalytic site, IAV RdRp contains multiple sites for potential antivirus

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Isolation, identification and evaluation of antioxidant, anti-inflammatory and antimitotic properties of bio-active pigment from *Rhodococcus corynebacterioides* SCG11

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ABSTRACT

In an examination during the cause of this study, yellow-orange producing bacterium was isolated from pharmaceutical effluent to assess its antioxidant, anti-inflammatory and antimitotic properties. Morphological and molecular (16s rRNA) characterization delighted the confine as a Gram-positive bacilli *Rhodococcus corynebacterioides* and assigned as SCG11. The 16S rRNA sequence was submitted to NCBI Gen Bank with accession number: KU995335 and gene ID: 1015917315. The phylogenetic investigation with most extreme probability technique indicated 100% closeness with *Rhodococcus* spp. PBTS1. Thin layer chromatography was done for extracted pigment with various solvents system; acetonitrile and water (8:2, v/v) was observed to be the best solvent system and indicated distinct separations. The pigment was additionally purified through silica gel column chromatography and purified pigment was exposed to GC-MS examination. GC-MS results reviled the presence of ~29 compounds out of which hexadecanoic acid methyl ester (peak area % = 5.75), n-hexadecanoic acid (peak area % = 7.59) have antioxidant properties, n-hexadecanoic acid (peak area % = 7.59) and ergotaman-3',6',18-trione,9,10-dihydro-12'-hydro-2'-methyl'5-(phenyl methyl)-,(5'α,10α)- (peak area % =3.19), ornithine (peak area % = 6.84) have anti-inflammatory properties and Pyrrolo[1,2-a]pyrazine-1,4-dione, hexahydro-3-(2-methylpropyl)- (peak area % = 3.78) has antimitotic properties.

INTRODUCTION

Pigments are synthetic or chemical compound which assimilate and reflect just certain wavelengths of visible light whose nearness in the cell or tissue gives it characteristic color. Pigments have assortment of hues (Tibor, 2007) and are utilized as additives, colorants, flavorings in ventures like sustenance, textile cosmetics, pharmaceutical and printing enterprises. They additionally have application in restorative field, for example, as therapeutic agents as an antioxidant, anti-tumor, anti-inflammatory, anti-microbial, anti-arthritis and different properties.

Synthetic pigments cause more environmental hazards compared to natural pigments; this awareness resulted in strong consumer demand for natural pigments/colors. Natural colors are generally extracted from fruits, vegetables, roots these are also called as bio-colors (Pattnaik et al., 1997). The major sources being the

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Superparamagnetic hematite nanoparticle: Cytogenetic impact on onion roots and seed germination response of major crop plants

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Abstract: Augmented escape of nanostructures to the ecosystem has necessitated the comprehensive study of their impact, especially on plants. In the current study, hematite nanoparticles were prepared by employing garlic extract and checked for their cytogenetic effect on onion roots and germination characteristics of five agricultural crops (*Vigna radiata*, *Triticum aestivum*, *Trigonella foenum-graecum*, *Cicer arietinum* and *Vicia faba*) in the concentration range of 20–100 mg/L. Onion roots exhibited an increased mitotic index till 60 mg/L dosage, beyond which trend decreased marginally. Percentage of aberrant chromosomes reported for 100 mg/L exposure was very low (3.358 ± 0.13%) and included common defects such as clumped/sticky metaphase, ring chromosomes, laggards, spindle abnormality, chromosome bridges etc. Moreover, comet assay, DNA laddering experiment and electron micrograph study confirmed negligible damage to onion roots. Seed germination study indicated a positive response in different agronomic traits (germination index, root length, fold change in weight and vigour index) up to 60 mg/L, beyond which either negative or neutral effect was observed. However, none of the samples showed 50% inhibition in germination index; highest being 33.33% inhibition for *V. faba*, compared to the control. In brief, biogenic hematite nanoparticles caused insignificant phytotoxicity and were likely assimilated as iron source at lower dosage.

1 Introduction

Recent years have witnessed an increase in extensive research and applications of iron oxide nanoparticles (IONPs) in various fields, such as environmental remediation, manufacturing industries, health care sector, sensor technology, photocatalysis, reaction catalysis etc. [1–3]. This enormous use of IONP has raised concerns about their chance to escape or deliberate release to the environment [3, 4]. Possible routes for environmental ingression of IONP can be through the agricultural application, in-situ dye/heavy metal adsorption, degradation of organic pollutants or waste liberated from industries, research institutes, health care firms etc. [5]. Although iron is one of the most common elements on earth and is required for vital functioning of living beings, elevated level of iron or presence of artificially designed iron oxide particles is likely to affect the organisms as well as the environment, adversely [6]. As a reason, National Institute for Occupational Health and Safety (NIOSH) has drafted a permissible exposure level of 14 mg/m^3 over a period of 8 h work/day for IONP [7]. Furthermore, nanoscale particles may also undergo some alterations in their composition or physical state, catalyse secondary reactions when exposed to surroundings and raise concerns of biomagnification [5, 8, 9]. Hence, it is very important to study the eco-toxicity and overall safety of nanoparticles prior to practical application.

Plants are the major food producer, render global food security and constitute 80% of total biomass across all the taxa in biosphere [10]. Additionally, they are distributed strategically in the biosphere and can directly interact with nanoparticles present on land surface, water bodies and atmosphere. Therefore, they are considered as idyllic candidates for examining the impact of nanoparticles. Nanoparticles, normally come in contact with plant roots through root tips and rhizoderm, while access to the shoot is through epidermis, cuticle and other apertures (stomata, hydathodes, lenticels) [5, 8]. Effect of nanoparticles on plants has been found to be advantageous in some, while negative impact has been observed in others. Tripathi *et al.* [11] have reported mitotic abnormality and decrease in growth traits in various plant species exposed to silver nanoparticles having wide size distribution. Zinc nanoparticles resulted in improved germination characteristics as well as biomolecule synthesis for *Brassica napus*, while mixed effect was reported for ZnO nanoparticles on *Solanum melongena* [12, 13]. Likewise, α-Fe_2O_3 nanoparticles were found to improve iron availability in peanut plants, promote chlorophyll synthesis in soyabean while reduced root conductivity (26%) was noticed in *Helianthus annuus* [14–16]. Hence, it is evident that plants respond distinctly to particular nanoparticle. Effect on plants has been typically found to depend on specific characteristics of nanoparticle, e.g. composition, size, shape, concentration, stability, synthesis route, presence or absence of coating agent etc. [5, 8]. Nanoparticles are applied to the plant system by either embedding in the soil or as additive to sterile water or soft gel.

Degree of phytotoxicity can be determined on the basis of different endpoints, such as genetic changes (alteration in chromosome number or shape, decrease in mitotic index, DNA shear damage, DNA unfolding), altered enzyme activity (decrease in amylase activity, higher expression of enzymes responsible for defence against oxidative stress), change in metabolic activity (photosynthetic rate, protein expression), effect on seed germination, measurement of ROS (reactive oxygen species) generation, analysis of morphological changes (abnormality in cell structure, change in root diameter) etc. [5, 17]. Among the various methods used to assess phytotoxicity, *Allium cepa* test and seed germination study are typical. *A. cepa* is a common agricultural cultivar which possesses a stable chromosome number ($2n = 24$). Any chromosomal changes on exposure to foreign agents can be easily visualised in roots exposed to mutagens. Multiple roots are generated in very small time interval (3–4 days), which can be analysed to get statistically significant and reliable results [18]. Additionally, entire protocol is uncomplicated, has good sensitivity and does not require specific technicalities. Another common plant toxicity test is checking impact of nanoparticles on seed germination which is an important stage of plant growth [17]. Different parameters analysed for the purpose are percentage germination, germination kinetics, root and shoot length, plant vigour, biomass, etc. [19]. Comet assay and electron microscopic

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Enzyme profiles of green gram seeds pre-treated with the herbal drug '*Kokilaksha*' followed by restoration of conditions favouring germination

Mamtha, M., Priya Mohan., Mrinalini Menon

Abstract— Treatment of green gram seeds with Kokilaksha (also termed as the HST – K drug) over a 24 – 120 hour period reduced growth parameters such as water imbibition, appearance of radicle, plumule, etc apart from inhibiting different enzymes including amylase and alkaline phosphatase. This was described as a cost-effective means for initial identification of potential antiproliferative compounds, whose therapeutic efficacy could be further studied. Extending the scope of this study, we sought to explore whether treatment of the seeds with HST-K for a shorter duration of time, say 24 hours would suffice for irreversible inhibition. Thus, in our present study, green gram seeds were treated with the 1:5 and 1:10 v/v diluted HST-K drug for 24 hours after which they were transferred to distilled water for 120 hours. Amylolytic and alkaline phosphatase activities in these seeds were restored to the extent of 35.6±0.6% and 32.4±4.6% respectively, vis-à-vis controls following treatment with the 1:5 diluted HST-K drug. In respect of both enzymes, pre-treatment with the 6.3-fold diluted HST-K drug followed by transfer to distilled water yielded restoration of 50% activity . These observations strengthen the view that the duration of exposure and related parameters deserve to be explored as part of the K-drug's efficacy studies against human disorders wherein amylase and alkaline phosphatase are overexpressed.

Index Terms— assay,green gram, growth inhibition, irreversible, K-drug

1 INTRODUCTION

The herbal drug formulation Kokilaksha (termed as the 'K'-drug or HST-K drug; Patent No.GB2454875 dt.20th Nov, 2007) derived from *Asteracanthalongifolia* prevented sprouting in green gram (Murthy et al, 2011), besides altering amylolytic and alkaline phosphatase activities in a dose dependent fashion (Deepthi and Menon, 2015). This approach had been used as a cost-effective method for the identification of compounds having anti-proliferative properties as a step towards exploring their anti-cancer potential (Kumar and Singhal, 2010 ; Murthy et al, 2011).

It may be pointed out in the above studies (Kumar and Singhal, 2010 ; Murthy et al, 2011; Deepthi and Menon, 2015), germinating green gram seeds had either been continuously exposed to the drug for 24-120 hours (Deepthi and Menon, 2015) or the observations themselves as a whole had been confined to 24 hours (Kumar and Singhal, 2010 ; Murthy et al, 2011).

Mamtha,M and Priya Mohan are masters degree holders from MS Ramaiah Institute of Technology Bangalore and the University of Nottingham, UK, respectively.
Presently Mamtha is working as senior research associate at Infiniti Research, Bangalore, while Priya Mohan is currently pursuing a degree in Drug Regulatory Affairs from Massachusetts College of Pharmacy and Health Science.
This work was carried out during their Bachelors program in Biotechnology Engineering at the Sir M Visvesvaraya Institute of Technology (Sir MVIT) Bangalore, under the guidance of Dr.Mrinalini Menon, Associate Professor, Dept. of Biotechnology,Sir MVIT Bangalore;
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These observations stimulated us to explore whether the inhibition of germination in green gram by HST-K drug was irreversible. Therefore we undertook the present study wherein seeds were treated with different concentrations of the HST-K drug for 24 hours, at the end of which they were transferred to distilled water that had been used as the control in all our previous studies. Observations were based upon the parameters used by us in our previous studies namely:-

- Seed weight and onset of morphogenesis.
- Specific activity profiles of amylase and alkaline phosphatase

2 MATERIALS AND METHODS

All chemicals were either obtained from standard manufacturers such as Sigma, Hi-Media and Merck or were of analytical/reagent grade, while the *Kokilaksha*formulation (Patent No.GB2454875 dt.20th Nov, 2007), was obtained from the Herbal Science Trust Bangalore. Seeds of *Phaseolus radiatus* (green gram) were obtained from the local markets.

2.1 Drugs used

The K-drug formulation was diluted 1:5 v/v and 1:10 v/v with distilled water as previously described by Murthy et al, 2011. As observed by us, previously, the pH of all these solutions was found to be 6.5-7.0 (Deepthi and Menon, 2015).

2.2 Seed treatment

Green gram seeds (0.5 gms) were treated with different

Optimization of process parameters for the green synthesis of silver nanoparticles using Plackett-Burman and 3-level Box–Behnken Design

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Abstract

In this study, optimization of process variables for the green synthesis of silver nanoparticles (AgNps) from leaf extracts of *Piper betle* and *Jatropha curcas* was carried out by two chosen statistical models Plackett Burman design (PBD) and Box Behnken Design (BBD). The phytochemical components in the leaf extract play a vital role in reducing the $AgNO_3$ and synthesizing AgNps. During reduction process, several factors which affect the synthesis of nanoparticles have been found to be pH, temperature, pressure, time of reaction, microwave radiation exposure time, UV radiation exposure time, concentration of plant extract, concentration of silver nitrate and sunlight exposure time. A mathematical model was developed to correlate the interactive influence of the parameters and the significant reduction. Plackett-Burman design (PBD) indicated that concentration of plant extract, concentration of silver nitrate and sunlight were the major parameters affecting the synthesis of silver nanoparticle. The mutual interactions of these variables were mapped in the design by 3 Box-Behnken design (BBD). The significant factors and their interactions in the green synthesis were examined by analysis of Variance (ANOVA). The result indicated that the BBD was a good predictive model for the experimental results. Satisfactory yields were obtained of AgNps using optimum conditions as compared to conventional synthesis of nanoparticles. Nanoparticles synthesized under optimized conditions from both plant extracts when characterized showed uniform size and shape i.e. spherical shape and size of 41 nm and better yield of 50 µg/mL and 51 µg/mL from *Piper betle* and *Jatropha curcas,* respectively.

Key words: Optimization, Silver Nanoparticle, green synthesis, Plackett-Burman Design (PBD), 3-level Box–Behnken Design (BBD)

Introduction:

Metal nanoparticles are gaining increasing attention due to their optical, electrical and catalytic properties. They are widely applied in various fields as medicine, water treatment, energy conversion, magnetics, mechanics and so on [1, 2]. Although there are various techniques for synthesis of AgNps such as chemical reduction [3], micro emulsion [4], photoreduction [5] and radiation [5]; green synthesis of AgNps serves as a more economical and eco-friendly way of synthesizing. Though many physical, chemical and biological methods have been researched for nanoparticle synthesis, AgNps synthesized via physical and chemical methods cannot avoid the use of toxic agents. These methods rely on use of organic solvents and toxic chemicals: N, N-dimethylformamide, sodium borohydride, and hydration hydrazine [6] which have raised environmental concerns. Green synthesis seems as an alternative ecofriendly and sustainable approach in synthesizing AgNps. Although the technology is proven to be cost effective it also takes into account environmental safety. The phytochemical components in the leaf extract: asterpenoids, flavones, ketones, aldehydes, amides and carboxylic acid play a vital role in the reducing activity of the silver nitrate solution. The secondary metabolites found in the plant extract as flavones, organic acids and quinines are water soluble metabolites and are responsible for its immediate reduction of ions. Green synthesis method thus enables better synthesis by fast reduction of ions [7]. However, by optimizing various parameters as temperature, pH more

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Artificial intelligence enabled plant emotion xpresser in the development hydroponics system

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Abstract

In this paper the development of scalable Hydroponics monitoring systems is presented. Hydroponics, a system of growing crops without soil, has been successfully used to grow crops on a commercial scale. Hydroponics has the potential to fill the gap of low agricultural production in India due to its high efficiency while serving as an environmentally friendly alternative to soil culture. This method of farming has benefitted from new technologies like IoT and machine learning that make it possible to integrate intelligent agents in the management of hydroponic systems as well as collecting live data. These technologies allow for increased automation and refined control of hydroponic systems. In this paper the development and execution of a hydroponic structure equipped with intelligent agents for internet enabled monitoring, data collection and storage.

Problem Formulation

Nowadays, as the population is growing widely it becomes difficult for the cultivation of plants in the land. There are different types of soil present on the earth, it is not possible to cultivate all types of plants everywhere. Due to scarcity of water, it becomes difficult for the farmers to cultivate the plant in the soil. In conventional methods, farmers need to monitor the plants frequently for the good yield. The effects of global warming, and the plants are affected with UV rays. For this reason, it is more difficult to plant in an uncontrolled environment. To overcome all the above problems, we implement the cultivation of plants in water without soil.

Introduction

The feeding source in today's world is agriculture and land mass. The Indian economy is exceedingly reliant on agricultural yield. As there is increased food demand, labor cost, unstable weather conditions and less area of agricultural land, there is an essential need towards enclosed farming such as Hydroponics and Aeroponics [1]. Hence it is vital to use advanced techniques to increase the productivity of the agricultural products and thereby increasing income of farmers.

Hydroponics technique utilizes no soil for the plant growth, instead the plants are used to grown in nutrient based solvents, so that chemicals in soil won't affect the plant growth, also in hydroponics system the plant grows in a faster rate than in soil based cultivation [3]. The existing techniques of hydroponic system include NFT (Nutrient Film Technique), DFT (Deep Flow Technique), and DRT (Dynamic Root Floating) [4].