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Thyroid Diagnosis Using Multilayer Perceptron

COVID-19 Time Series Forecasting of Daily Cases, Deaths Caused and Recovered Cases using Long Short Term Memory Networks

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COVID-19 Time Series Forecasting of Daily Cases, Deaths Caused and Recovered Cases using Long Short Term Memory Networks

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***Abstract*— Novel Coronavirus (COVID-19) outbreak that emerged originally in Wuhan, the Hubei province of China has put the entire human race at risk. This virus was declared as Pandemic on 11th March 2020. Considering the massive growth rate in the number of cases and highly contagious nature of the virus, machine learning prediction models and algorithms are essential to predict the number of cases in the coming days. This could help in reducing the stress on health care systems and administrations by helping them plan better. In this paper the datasets used are obtained from the John Hopkins University's publicly available datasets to develop a state-of-the-art forecasting model of COVID-19 outbreak. We have incorporated data-driven estimations and time series analysis to predict the trends in coming days such as the number of cases confirmed positive, number of deaths caused by the virus and number of people recovered from the novel coronavirus. To achieve the estimations, we have used the Deep learning model long-short-term memory network (LSTM).**

Keywords*— *Deep learning, Artificial Neural Networks, Long-Short-Term Memory (LSTMs), Pandemic, COVID-19, Corona-virus.

I. Introduction

The World has been affected by a highly contagious virus called the Corona virus or SARS-COV-2. This virus originated in the wet markets of Wuhan, Hubei province of China during December 2019. This virus quickly spread to more than 160+ countries within a span of 3 months causing over 400,000 deaths with more than 8.9 million people affected globally[7]. This virus has caused very distressing times across all the countries and significant disruptions in global economies. Several intervening measures have been taken by the affected countries such as quarantining people to stop the spread of the virus.

Coronavirus being a contagious and infectious disease like the flu with certain growth patterns, such patterns are noted to be non-linear and dynamic in nature. Data is Dynamic in nature as the cases might differ based on the seasons, populations etc. [2]. Thus a deep learning model based on long short term memory networks using Pytorch framework can be used to predict the data accurately.

Deep learning power in the field of Artificial Intelligence can be established by recurrent neural networks (RNNs) and LSTMs. These models are one of the best dynamic models that are used to generate sequences in multiple domains such as recognizing speech and music, emotional tone prediction for a piece of text (sentiment-classification of text), caption generation and machine translations [3]. There are different methods to achieve the task for time-series analysis, Machine learning algorithms like Linear and Logistical Regressions, SVM etc., are at the center of these applications [6]. While these tools are great in examining observations and reaching to conclusions, they come with some serious limitations. In most cases the data is skewed and relativistic. Considering this a robust new method using deep learning models are inevitable to gain time series forecasting results with higher accuracy.

II. Concepts

A. Artificial Neural Networks (ANN)

ANNs are programmed to try and simulate a human brain by modelling the neural structure on a smaller scale [3]. ANN consists of interconnected web of nodes joined by edges known as neurons. The main function ANN is to perform progressively complex calculations on a set of inputs, then use the output to solve a problem [2]. ANNs are used for lots of different applications. An ANN typically consists of 3 layers namely input, hidden and output layers. Neural net can be seen as a result of spinning classifiers composed in a layered web; this is because every node in the hidden layer and output layer has their own classifier.

B. Recurrent Neural Networks (RNN)

Recurrent neural networks (RNN) find their best usage when the patterns in data vary with time. This deep learning model is a simple structured model with a built-in feedback loop that allows it to act as a forecasting-engine [15]. In the feed forward neural network signals have unidirectional movement from input to output one layer at a time, In RNN the layer's output is added to the next input and fed back into the same layer. Contrary to feed-forward neural nets, an RNN can accept a sequence of values as input and produces a sequence of values as output, the capability to operate in sequence unfolds RNN to a wide variety of applications [13]. It is possible to obtain a capable net of more complex outputs by stacking RNNs one on top of another [20].

Smart Water Consumption Monitoring System using IoT, Android and Cloud Computing

Proceedings of the Fifth International Conference on Communication and Electronics Systems (ICCES 2020)
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Cloud-based Internet of things for Smart Water Consumption Monitoring System

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Abstract - The levels at which groundwater is depleting around the world is alarming and there is an impending necessity to be judicious with water usage. This led to the formulation of a consolidated architecture to monitor water consumption at the household level. Internet of Things (IoT) is combined with the Thingspeak Cloud Computing platform and Android Studio to facilitate an efficient dashboard for consumers. The proposed model aims at imbibing a sense of responsibility in the citizens as it helps keep a track of water usage periodically using visually appealing charts, lays down the monthly water utility costs as well as provides tips with all in the form of a compact android application in their phones that is needed to be proactive and conserve resources. This paper presents a tested prototype and the pipeline connecting the hardware and software components responsible for streamlining the process of data transfer from IoT to cloud and from cloud to the android application. An overview of the promising technologies and frameworks that have been orchestrated in the development of the system as well as results obtained are thus provided.

Keywords - Water Consumption Monitoring System, Internet of Things(IoT), Thingspeak Cloud, Android Studio

I. INTRODUCTION

Water is one of the primary sources of survival for all life forms on earth. A lot of our day to day activities such as bathing, cooking, washing is dependent on the use of water. The community needs water for various activities beginning with the production of food [6] and irrigation. But now the world is heading towards a water crisis due to the excessive and uneconomical use of water by the large human population[8]. The World Economic Forum has announced in 2015 that the water crisis ranks the eighth global risk with the highest likelihood of occurring within 10 years[4]. This has left many fearing that the shortage of water is probably going to be the most important cause of conflict in the coming years[1]. The importance of groundwater conservation practices has undergone a gradual increase as it can lessen wastewater discharge which can further result in improved water quality. They also diminish the necessity to search for or create new water sources, leaving them in reserve for future use. Hence it is extremely important to conserve groundwater by constantly monitoring and regulating usage starting at the individual household level. The designated system strives to achieve just that. One of the main objectives of the system is to imbibe a sense of responsibility in the citizens by preaching the importance of water and its conservation. The monitoring dashboard provides tips for being conservative with the daily usage consumption and also allows them to set limits on the same. Once the limit is approached or has reached, the consumer receives an alert regarding the same, leaving room for usage reduction.

Some of the real-time applications of the system in the domestic/household-front include -

i. Track units of water consumed hourly/daily/weekly/monthly.
ii. View live analysis of consumption statistics in the form of interactive charts.
iii. Set limits on water consumption and receive alerts when the limit approaches or has reached.
iv. Receive monthly water utility cost bills and log reports based on the units consumed.
v. Be mindful of the usage by receiving tips on conservation timely.
vi. Educate residents as well as house help personnel.

The organization of the rest of the paper is as follows. Section II briefly overviews the technology involved

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Multi-Functional Blind Stick for Visually Impaired People

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***Abstract*— One of the biggest problems faced by the visually impaired is navigating from place to place, be it indoors or outdoors. Further, the adverse conditions of the roads make it even more difficult for them to walk outdoors. They have to be alert at all times to avoid consequences like colliding with stable or moving obstacles, ascending or descending staircases, slipping down wet terrain. Also, at times they may be in distress and might want to send an alert message to their relatives or friends about their whereabouts. These problems of blind people can be addressed with the intervention of technology. The proposed solution employs the Internet of Things (IoT) paradigm to provide a medium between the blind and the environment. Several sensors can be used to detect anomalies like obstacles, staircases and wet terrains respectively. The prototype discussed here is a simple, sophisticated and affordable smart blind stick equipped with various IoT sensors and modules. Also, this solution provides a way to send a message about the whereabouts of the user to the concerned people. Adding to the above, a software application is designed to help the acquaintances of the blind to manage the stick's configuration ex: add or delete phone numbers to which alert messages have to be sent. Misplacing the stick indoors can also be a substantial issue. This solution also addresses this problem.**

Keywords*— *smart blind stick using IoT, obstacle detection, wet terrain detection, alert messages, finding misplaced stick.

I. INTRODUCTION

According to the World Health Organization, there are nearly 285 million people with some form of visual impairment out of which 86% people have low vision and 14% people are blind. Vision is one of the most important senses to humans to survive. Vision helps to connect with the surroundings. People deprived of vision rely on other dependencies like a simple walking cane or other people. In familiar places like the interiors of a house, they memorize the site directions, obstacles on their way and navigate according to them. However, it is not always safe for the blind to rely on their memory to move from one place to another. Especially when they are out-doors. Not all the times blind people are offered help from others and hence there is a need for a device, such as a stick, which can assist the visually impaired people in all forms of life.

The main characteristics for the stick to be useful to every visually impaired per-son is for it to be efficient and cost effective. The obstacles such as people, vehicles, stones in the outdoors and stairs, walls, furniture in the indoors hinder the way of the blind. The blind stick developed, alerts the user about various obstacles through a vocal sound from a speaker on the stick. The stick can also detect wet and damp surfaces and raise a vibratory alert to the user.

To a person who is visually impaired, a mobile phone doesn't effectively serve the purpose to send a panic message whenever the person ends up at a location unknown to him. A simple button on the stick will do the job of sending a message to the acquaintances of the blind person. A software application is designed to let the acquaintances change, add or delete the phone numbers. The user can also set up the phone numbers with the help of the supplier, who has admin access to change the phone numbers. To assist the user if a stick is misplaced, a remote with button is provided, which when pressed, makes a buzzer sound on the stick.

II. RELATED WORK

Smart blind stick is an innovative stick which is designed for visually impaired people for improved navigation. The smart stick proposed by M. P. Agrawal [1] can identify all obstacles in the path using a water sensor, ultrasonic sensor, RF module and GPS-GSM module installed in it and pass it on as vibrations to notify the user about hurdles on the way. A blind stick named iWalk by R. F. Olanrewaju [2] has a water sensor integrated therein that activates a distinct buzzer if it detects water. The system also has a wireless RF remote control that produces a sound when pressed, which helps in locating the stick. A stick guide model was proposed by K. B. Swain [3] which consists of GPS and GSM which sends SMS whenever the person needs help. It uses an ultra-sonic sensor to detect obstacles and an infrared sensor for level detection. Nadia Nowshin [4] proposed an Arduino Nano based stick which detects the obstacles using Ultrasonic sensors and an android mobile application to help a blind person. Radhika R [5] developed a model which can detect obstacles within the distance of about 3m with the help of infrared, ultrasonic and water sensors sensors. The blind person can also communicate his location to his guardian using GPS and GSM modules. A blind stick by Manikanta K [6] is integrated with an ultrasonic sensor along with light and water sensing. It sends a signal to sound a buzzer if an obstacle detected is close enough. O.B. Al-Barrm [7] proposed a 3D ultrasonic walking stick in which buzzer and vibration motors are activated when any obstacle is detected. The stick is also equipped with GPS and GSM to communicate the location of blind people. The main component of P. Sharma [8] is the ultrasonic sensor which is used to scan a predetermined area around blind by

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Forex exchange using big data analytics

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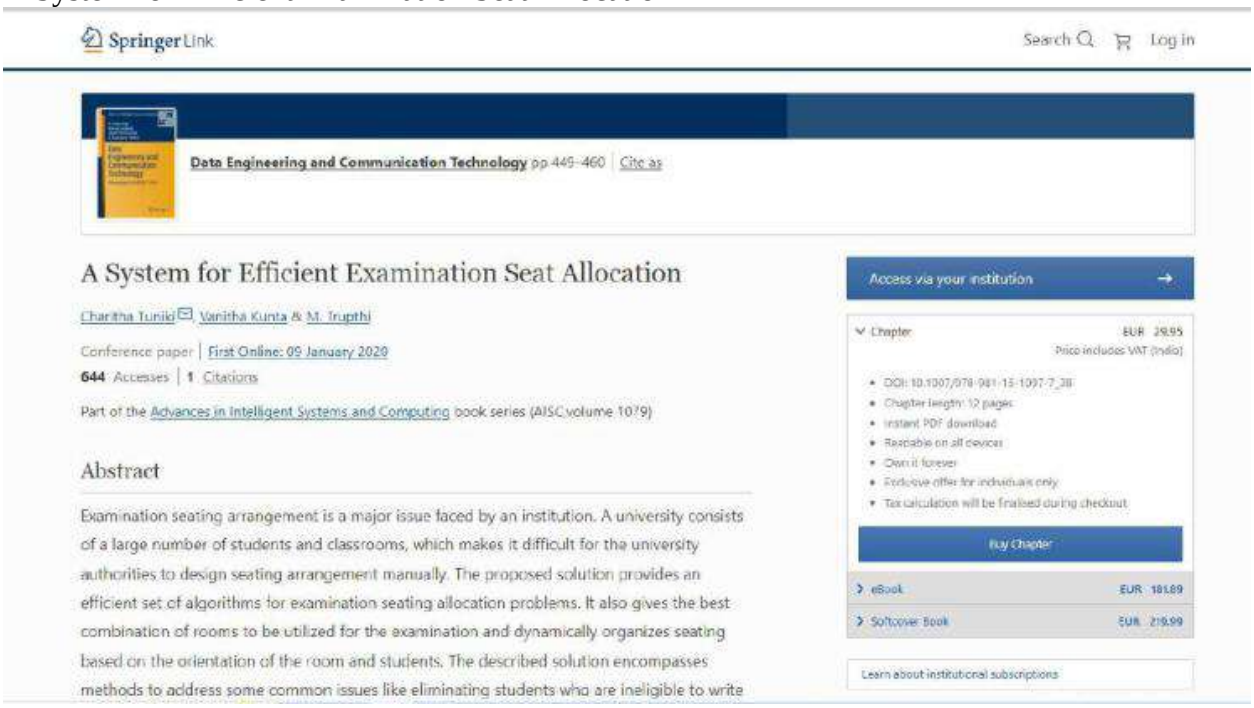
Abstract. Analysis and Prediction of forex has gained immense value in today's economy. The stock price prediction is a difficult process owing to the irregularities in stock prices. Every trader wants to know if the pattern has been repeated in past to know what the possible output of the current situation will be. The primary objective is to propose a methodology that will use a historical dataset and provide a more accurate prediction on stock price. In this paper, we will be using machine learning pattern recognition algorithm on forex tick dataset. The learned model then will produce pattern from the given dataset and on the pattern of increasing or decreasing, the buyer will initiate a buy or sell the stock respectively. We will use python coding to execute the algorithm in jupyter notebook. Matplot library will help us to perform graphing in the process and Numpy will be helpful in doing statistical analysis of data.

1. Introduction

Every trader wants to find out the pattern of the forex before he makes any decision of making small or big investment in that forex. These changes in forex market reflect directly to the economy of the area. There is abundance of algorithms that could be found on the Internet that allows the user to predict the next change in forex market. Most of these are just a hoax and a way to manipulate people. We are going to find out patterns by plotting together the lines of those patterns on graph, which are very much similar to on another. Then we will perform back test on these results. A forward test can be performed on the upcoming data that has been produced after the prediction of the data but that data cannot be back tested to give the guarantee that it is indeed a suitable prediction.
We are using python here because it is a single threaded language, it uses single core of CPU, which means one script will use only one CPU (see ref. [8]-[14]).

We have many variables to be accounted for, not just the explicit ones but implicit ones too. Some of the explicit variables are percent change as pattern recognition, start point to current location percent change, fixed pattern length, fixed value/weight of pattern irrespective how old or new the data is.

A System for Efficient Examination Seat Allocation



Applying Data Mining Technique to predict trends in Air pollution in Mumbai

Applying data mining technique to predict trends in air pollution in Mumbai

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Abstract. Prediction of air quality is a topic of great interest in air quality research due to direct association with health effect. The prediction provides pre-information to the overall population of the area about the status of pollution on which they can take precautionary measures and can protect their health. The problem arises when the level of SO2, NO2 and residual suspended particulate matters in the air increases than that of theirs restricted level. In this paper, the Prophet Algorithm, open source software, is applied to predict the trend of air pollution in the city of Mumbai, Maharashtra. The Prophet is machine learning algorithm to forecast and also to predict time series data. It is based on additive model where non-linear trends are fit with yearly and weekly seasonality. The graphical results are generated after using this algorithm which shows the trending pattern of the pollutants in the air of Mumbai.

1. Introduction

Nowadays, the continuous and strict monitoring of air pollutants is of great importance in the process of evaluating regulatory control measures related to air quality [1]. Many countries are installing and actively monitoring the air pollutant matters in order to keep them under control. Air quality reports for the various region of the country are published regularly [2][3]. As a result, data are getting accumulated and this results in generating various reports, including statistical one in order to find different pattern among those data.

In our paper, two hazardous gas, sulphur dioxide and nitrogen dioxide are considered because both of these gases are most harmful and we have collected the dataset containing these two gases [4][5]. Scientific research has proven that these gases have many negative effects on human health. Sulphur dioxide is significantly a toxic gas that can cause inflammation and irritation of the respiratory system, whereas Nitrogen dioxide, another toxic gas for human beings, can form nitric acid with water in the eyes, lungs, mucus membranes and skin [6]. Exposure to high concentrations of NO2 can cause lung

Movie recommendation System using clustering mining with python

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Estimating Savings Potential of Solar Energy

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***Abstract*: The climatic conditions in India are among the best that can be used maximise solar energy potential and are capable enough to make solar energy serve the purpose as an alternative source of electricity to Thermal and Hydro electricity. However, the high installation costs of the solar panel coupled has prevented solar energy growth in the country. But when looked at from a broader perspective, solar energy can decrease the costs for electricity as well as help to reduce the adverse effects of using non-renewable energy resources like Thermal electricity. The proposed system determines a mechanism to estimate the amount of savings that an individual could make by using a solar panel on their rooftop. Deep Learning is applied to process and segment the rooftop images while removing obstructions such as trees, electric poles etc. and estimate the area of the rooftop. The solar radiation values and weather patterns of a region are considered and the calculated area is used to predict the amount of energy that can be produced by installing a solar panel on the roof.**

Keywords:* *Solar Energy, Deep learning, Image Segmentation, RoofTop Detection, Cost Estimation, Area Estimation, Solar Panel, Energy Savings

I. INTRODUCTION

Research studies have stated that solar energy could be used to produce electricity that could serve the requirements of the present human population. However, most of the human population is either still not aware of that fact that solar energy can serve as a reliable source of energy or assume that it is a costly process to install a solar panel. So, this paper proposes a model that can give an estimate of the amount of savings that a consumer can make if he uses solar energy to meet his electricity needs. This model considers various factors such as the solar radiation factor of the region, weather conditions, the efficiency of the solar panel etc. This paper aims to convey the importance and feasibility of a renewable source of energy to serve the purpose while saving the non-renewable sources from extinction.

II. RELATED WORK

The research by Sara Najem[1] discusses the usage of Solar Analyst of ArcGIS to estimate Beirut's potential solar power gains from the installation of photovoltaic panels (PV) and calculate the number of benefitting subscribers. [2] discusses the extraction of rooftop images by integrating four co-relative priors namely depth cue, uniqueness, shape and transition surface in order to overcome the issues like different rooftop sizes and heights and provide more accurate results. In [3] the authors propose a system that calculates the distance between two points using Haversines formula from the Google Maps data. In [4] the authors propose a solution to calculate the solar potential using latitudes and longitudes of the building. The authors in [5] propose a system that is used to detect rooftop images from satellite imagery and also helps to identify the areas of vegetation and shadows using color invariants. In [7] the author discusses an example system that provides a utility to predict the power generated from wind and solar resources based on the real time observations while addressing the Big Data needs.

III. EXISTING SYSTEM

In the existing system, there is no mechanism to detect, analyse and estimate the power savings from a rooftop image. While there is a system that used to detect the rooftop alone, there is another system that uses a different mechanism to predict the area of the rooftop. However, a system was built by using solar panels manually and put the region under observation for a period to estimate the savings. There are several disadvantages to the existing systems. Few of them are listed as follows:

- Requires excessive manual efforts
- No system to determine the solar potential directly
- Not considering the weather conditions of the region

IV. PROPOSED SYSTEM

As electricity is becoming one of the basic necessities for mankind and a major part of it is being generated using non-renewable sources of energy, there is a need to make humans realise that solar energy can serve as an alternative to serve their purpose. This paper proposes a system that can be used to estimate the savings that an individual can make by installing a solar panel on their rooftop. The model developed takes a rooftop image as the input and gives an estimate of the amount of money one can save by installing a solar panel. This model also considers the solar potential of the region, the irradiation factor and the weather patterns that are determined based on the location of the user. The fundamental tasks involved in determining the savings potential of the region are RoofTop detection and Extraction, Estimation of Area on Rooftop available to install a solar panel and calculation of Units that are generated using those panels.

A. Flow Chart

The flowchart of the proposed system(see fig 1.) represents the various steps involved in determining the solar savings potential of the region. In the first step, the model takes a rooftop image as the input which is processed and in the second step, the rooftops are detected and extracted using Hierarchical RGB-D priors as shown in [2]. In the third step, the extracted rooftop area is processed and the area up to which solar panels can be installed on the roof is estimated. The resultant area along with the irradiation factor, the solar potential of the region and efficiency of the solar panel are fed to the next step where the solar savings potential of the region is calculated.

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Influence of titanium oxide fillers on the tensile and flexural properties of E-glass fabric/epoxy composites

Balu Maloth [a], N.V. Srinivasulu [b], R. Rajendra [c]

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Recent Trends in Mechanical Engineering pp 65–79

Non-premixed Combustion Analysis on Micro-Gas Turbine Combustor Using LPG and Natural Gas

Ch. Indira Priyadarsini, A. Akhil & V. Srilaxmi Shilpa

Conference paper | First Online: 12 January 2020

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Abstract

Gas turbine effectiveness is mainly having an effect on design of combustor; in this work, studies have been made on different parameters of a typical micro-gas turbine (MGT) that changes the flow inside the burning area. A combustion room is created by utilizing SOLIDWORKS modeling tool and exported to workbench design modeler where computational fluid dynamics analysis is performed by ANSYS fluent. We considered a probability density function (PDF) of

About this paper

Cite this paper

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Non-premixed Combustion Analysis on Micro-Gas Turbine Combustor Using LPG and Natural Gas

Ch. Indira Priyadarsini, A. Akhil and V. Srilaxmi Shilpa

Abstract Gas turbine effectiveness is mainly having an effect on design of combustor; in this work, studies have been made on different parameters of a typical micro-gas turbine (MGT) that changes the flow inside the burning area. A combustion room is created by utilizing SOLIDWORKS modeling tool and exported to workbench design modeler where computational fluid dynamics analysis is performed by ANSYS fluent. We considered a probability density function (PDF) of LPG fuel with non-premixed combustion mode and activated in radiation model of P-1. Design criterions of chamber height and number of holes on flame tube are varied to get the optimum performance and also considered as two dead zones in between the combustion and dilution zone. The optimized design chamber resulted in a turbine inlet temperature (TIT) of 1301 °K with a velocity of 620 m/s and also is provided with low NOx emission below 54 ppm.

Keywords Micro-gas turbine · Radiation P-1 · CFD fluent · Non-premixed

1 Introduction

Energy is a crutial property in order to run any machine, one of the highest forms is an electrical mode which is easily transferred over a long stretch and can be generated almost anywhere by using proper technology. Solar PV cells or lense, windmills, turbines, both steam and gas, nuclear and hydro are some of mechanisms that produce energy. Out of all, gas turbine has its own merits over other types; therefore, it focuses on this aspect; it gives electrical power from the burning of inflammable fuels such as petroleum products, hydrogen gases, and air mixture; when the mixture burns, the

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An Experimental Investigation of Self Compacting Concrete containing Recycled Concrete Aggregates

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ABSTRACT:

There is an increasing demand for production of Self-Compacting Concrete (SCC) now in the present construction industry, which has its roots in the early 1980's. As everyone in the construction industry are searching for an alternative to traditional concrete, this SCC has been providing best solution and rectifying all the problems that were faced by using traditional concretes. The application of recycled aggregate in Self Compacting Concrete (SCC) is influenced by the quality of the concrete from which the recycled aggregates are generated. In recycled aggregates, mortar gets attached to it. The physical and mechanical properties of the recycled aggregates relate to the quality and quantity of the Recycled Aggregate Concrete (RAC) produced.

This paper highlights the properties of recycled concrete aggregates produced in Hyderabad (India) in comparison to the properties of Natural Aggregate prescribed in Indian Standards. It briefly discusses about some of the guidelines/specifications of recycled concrete aggregate adapted for structural applications in various countries, and also describes the outcome of tests carried out on the use of Recycled Concrete Aggregate in Self Compacting Concrete. Recycled aggregates used in this study were produced by crushing of Construction and Demolition Waste (CDW) collected from buildings being dismantled for renovation. Seven different concrete mixes were produced; five recycled concrete aggregate percentages viz. 0%, 25% 50%, 75% and 100% with varying fly ash content. Investigation on Utilization of RCA in M30, M50 and M70 grade Self Compacting Concrete based on the experimental studies carried out at Research center JNTUH–Hyderabad. on Self compacting concrete(SCC) made of recycled concrete aggregate(RCA), conclusions are drawn on their utilization for making concrete with the help of modified Nan Su mix design, regular mixing technique and with the addition of mineral admixtures. Tests were carried out for compressive strength, split tensile strength and flexural strength. The findings from the study show that the recycled concrete aggregate may be useful for construction industry as an alternative for natural aggregates. However, further research is needed particularly on the long term field performance of the recycled aggregate concrete before it can be used with confidence.

Keywords: *Self Compacting Concrete (SCC), Recycled concrete aggregate (RCA), Indian Standards(IS), Mix design*

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Performance Characteristics of Self-cured Recycled Aggregate Concrete with SCM's

Lakshmi Thotakura, Sankar Kumar Reddy Pullalacheruvu, Ganesh Babu Kodeboyina & V. Krishna Rao Mupparisetty

Conference paper | First Online: 21 November 2020
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Part of the Lecture Notes in Civil Engineering book series (LNCE,volume 97)

Abstract

Self-cured recycled aggregate concrete with shrinkage reducing admixtures is one of the pioneering researches in the construction industry. There is a possibility of depletion of natural resources due to prolonged consumption over a period of time in our modern civilization. In this research, characteristics of recycled aggregate concrete with supplementary cementitious materials (SCM) like powdered limestone and fly ash with self-curing agent PEG6000 were investigated along with the

About this paper

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Mechanical and durability studies on blended pozzolonic concretes with fly ash & recycled aggregates

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Mechanical and durability studies on blended pozzolonic concretes with fly ash & recycled aggregates

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ABSTRACT

This paper reports mechanical and durability studies of blended pozzolonic concretes. Blended concretes were produced by partially replacing the cement by 25 percent fly ash and the Natural Coarse Aggregates (NCA) were replaced by Recycled Coarse Aggregates (RCA) in different fractions of 0, 25, 50, 75 and 100 percentages. Mechanical properties like Compressive Strength, Stress Strain behavior, and Modulus Of Rupture (MOR) of concrete and durability studies like carbonation depth and accelerated corrosion are reported. Experimental studies revealed that the compressive strength, Stress Strain Curves, Modulus of rupture of blended concrete having a resemblance to conventional concrete with NCA, at an optimum replacement level of 25 percent of Fly ash by weight of cement and 75 percent RCA by weight of NCA. It is observed that the carbonation depths were increased with increased content of RCA. Charge Deterioration Factors (C_dDF) for a given effective cover, at a given duration of charging for NCA are lesser than that of RCA, which demonstrates corrosion resistance of NCA when compared to other mixes.

Selection and peer-review under responsibility of the scientific committee of the First International conference on Advanced Lightweight Materials and Structures.

1. Introduction

Mechanical properties of concrete governs the performance of concrete under various structural loading conditions. It has been reported in the literature that the compressive strength decreases generally from 10% to 20% than that of natural aggregate concrete with increase in RCA amount at the same w/c ratio [4,5]. The shape of the stress–strain curve for of Recycled Aggregate Concrete (RAC) was correlative to that of the Natural Aggregate Concrete (NAC), regardless of the RCA content, which leads to the denouement that there would be no objection in the design modus operandi and exercising the theory of plasticity [6]. The flexural strength of RAC has been found to decrease with increase in RCA replacement ratio [7].

This present study investigates compressive strength of concrete, Stress-Strain behaviour, and modulus of rupture with fly ash partially replacing cement and RCA replacing NCA. Experimental studies affirms that the compressive strength, elastic modulus and modulus of rupture are having a close similitude to standard concrete with NCA at an optimum replacement level of 25 percent of Fly ash and 75 percent RCA.

2. Experimental details

Two types of Concrete mixes i.e., M35 and M45 grades were proportioned with different replacement ratios of Natural Coarse Aggregates (NCA) to Recycled Coarse Aggregate (RCA) (100:0%, 75:25%, 50:50%, 25:75%, 0:100%) respectively. Fly Ash content is 25% by weight of cement in all the mixes.

Mechanical properties like Compressive strength, stress strain characteristics, modulus of rupture were evaluated on standard cubes, cylinders and prism specimens as per IS 516. Durability properties like carbonation depth and Charge deterioration factors were evaluated on Cylindrical specimens of size 150 mm diameter and 300 mm height and prism specimens of size 150mmx150mmx500mm respectively.

3. Materials

OPC 53 Grade conforming to IS 12269-2013 [8], and Class F fly ash conforming to IS 3812 (Part 2)-2013 [9], were used. Local river sand conforming to Zone II of IS 383:2016 [11] was used as fine aggregate. Natural Coarse Aggregate (NCA) considered for the

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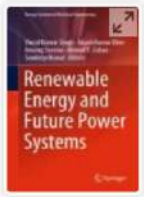

Renewable Energy and Future Power Systems pp 35–80

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

Sudhakar Babu Thanikanti, Dalia Yousri, Dalia Allam, M. B. Etebia & Karthik Balasubramanian

Chapter | First Online: 27 March 2021

413 Accesses

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Abstract

Selection of a suitable power electronic converter to meet the desired outcome for any sort of application is a major step. In the case of solar photovoltaic (PV) systems, the right selection of a converter has a significant impact on its efficiency. Over the past few decades, scholars have carried out a great deal of analysis to satisfy load specifications. The electronic power converters produced vary from several milliwatts to megawatts of power depending on requirements. A thorough analysis of these

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Dehaze Model to Improve Object Visibility Under Atmospheric Degradation

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***Abstract*—Optically captured images from the outdoor scenes will be humiliated by natural occurrences of Fog, Mist and Haze. This is due to atmospheric absorption and scattering of visible information, resulting in poor object visibility. It is necessary to estimate the quantifiable parameters of this atmospheric degradation to improve the visibility. Dehazing models attempt to estimate scattering parameters. Single image dehazing models are observed to possess estimation of inaccurate textures, thereby leading to blocking artifacts. The imbalances in the concentration of atmospheric particles and air-light are crucial, that should be mitigated. The available models have to be improved in terms of image parameters such as contrast, saturation and color information. The work reported in this paper emphasized the model that estimates intensified transmission map from the hazy images with color distortions and thereby exploiting scattering parameters for dehazing.**

***Index Terms*—Semi-inverse image, Hue Disparity, Contrast, Depth map.**

I. Introduction

Visibility is a measure of clarity of the atmosphere. A clear scene is obvious for low-level image analysis as well as for high-level object recognition. Outdoor image captured by the satellite or drone has large structured objects relatively represented by less number of pixels. The visibility degradation in aerially captured images is because of the terrible medium which consists of the particles and water droplets in the atmosphere.

The international definitions of visibility range for different weather conditions is depicted in Figure 1 [1]. Due to atmospheric absorption and scattering of the light from source to observer due to haze, fog, smoke, mist, etc., effects the information in the outdoor images. As a result, the contrast and color fidelity is lost in the outdoor images acquired under various weather conditions. The presence of different sources of interference in imaging makes its modeling very challenging. Therefore, recovering from degraded image is always a challenging task and it is ongoing interest in the image processing and computer vision fields.

Developing image dehazing techniques helps many real world applications like intelligent vehicles, remote sensing, under water imaging, etc. In security systems, detecting suspicious objects like aerial/balloon bombs, airdropping of weapons, small explosive devices lying on the ground, landmines, etc., is a cumbersome issue, when the scene radiance is degraded due to the atmospheric conditions. Apart from this, when the color of these objects is similar to the atmospheric background then it is a cumbersome task to identify them.

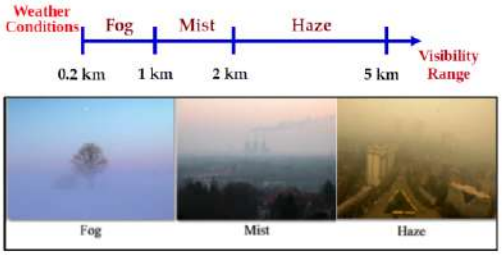

Figure 1: International definitions of visibility range [1]

Scattering effects pose new challenges in the form of degradation on the computational aspects of image analysis [2]. The path radiance is the main contribution for hazy image and the haze transmission can be estimated using the dark pixels. Searching the dark objects locally in the whole scene can be used to construct haze thickness map [2]. Upon subtracting the haze thickness map from the hazy image, allows one to recover the haze-free image at the sensor. Therefore, there is a need to model a framework for enhancement of images which is insensitive to environmental conditions. The overview of dehazing models is discussed in the next section.

II. Overview of Dehazing Models

The dehazing models are of two kinds- non-model based and model based. The restoration performance of non-model based approaches such as Gamma-correction and Histogram equalization is not that effective when compared to model-based approaches to address all types of haze levels. The model-based restoration algorithms are classified based on the number of input images used for restoration. In multi-image haze models, images captured at different degrees of polarization using a polarizer [3], [4], [5] or a special imaging

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Correlation Factor-based Fault-Phase Detection for Series Compensated Transmission Line

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***Abstract*— Distance relays are designed to perform correctly on a resistive/inductive power system. If series capacitors are introduced, the voltage and current relationships deviate from their normal way especially when the fault levels are not sufficient to flash-over the gaps or to produce significant conduction in the Metal Oxide Varistors (MOV). A compensated line imposes problems to directional relaying schemes due to voltage and current inversion situations, operation of MOV which protects series capacitor and reactance modulation issues. In this paper, a novel methodology is proposed to identify faulty phases based on correlation factor computation. The presented method is tested on series capacitor compensated transmission lines (SCCTLs) for the IEEE-14 and IEEE-57 test systems. Simulation results show that the proposed method has identified the correct fault zone. Simulations are done using PSCAD/EMTDC platform.**

Keywords*— *Distance Relay, Series Capacitor, Series compensated transmission line, MOV, PMU, wide-area monitoring system(WAMS), supervise zone of protection, adaptive out-of-step relaying.

INTRODUCTION

The series capacitor protection unit may affect the accuracy of fault location in transmission line. Its location in the middle or end of the line can affect the accuracy of the result [1]. Without phase of the fault detection, the fault detection problem is incomplete. If any communication link fails in the network, then information required to obtain fault detection will be incomplete. Fault direction estimation is also an important part in a fault detection algorithm. The Estimated fault direction may be either upstream or downstream should be investigated.

A phasor-based technique for fault location is described in [1]. Paper [2] has described a fault location technique on double-circuit series-compensated lines using two-end unsynchronized measurements. Here MOV is considered in its natural environment without having any modeling inaccuracies. A nutshell about introduction to a phasor-based fault location algorithm is presented in [3]. In Ref. [4] MOV is considered in the natural environment and it is avoiding any modeling inaccuracies.

The presence of a series capacitor and its overvoltage protective devices (metal–oxide varistor (MOV) and/or air gap) create problems to distance relaying based transmission-line protection. Different problems associated with relays have been discussed in [5, 6] that include phenomena like voltage/current inversion, sub-harmonic oscillations, transients etc.

But, the above literature has failed in considering the impact of the series capacitor protection unit, detection of Phase of the fault, considering the communication link failure and, in fault direction estimation.

In this paper, the behavior of series compensated EHV transmission lines during faults is simulated. The importance is given on the impact of capacitor protection on modern techniques (MOV protection). A novel methodology is proposed to identify faulty phases based on correlation factor computation. Under various fault conditions, the proposed method is tested for its validation. The presented method is tested on series capacitor compensated transmission lines (SCCTLs), IEEE 14 bus and IEEE 57 bus test system with their various configurations and contingency combinations and performance is observed with transmission line both end voltage profiles. Distance characteristics are also drawn for various zones of protection. This faulty phase identification algorithm gives better results compared to the detection of faulty phase by imposing the tolerance limit method and the polar plot analysis gives more insight about the zone of the fault and chance of mal-operation.

I. SINGLE AND MULTI-PHASE FAULT PHASE DETECTION

In the proposed work, a novel methodology is proposed to identify faulty phases based on correlation factor computation. Linear correlation coefficient r is a measure of how similar the two signals or variables are. The mathematical expression for computing r is as follows:

$$r = \frac{n\sum AB - (\sum A)(\sum B)}{\sqrt{n(\sum A^2 - (\sum A^2)}\sqrt{n(B^2) - (\sum B^2))}} \quad (1)$$

Here, n indicates the number of pairs of data. The value of r varies between -1 to +1. The positive and negative signs indicate positive linear correlations and negative linear correlations, respectively.

Positive Correlation: A and B vectors are said to have a strong positive linear correlation if r value is near to +1. If r value is exactly +1, then it indicates a perfect positive fit. A Positive

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A Modified H-Bridge TransformerlessPhotoVoltaic Neutral-point-clamped inverter with constant common mode voltage”

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A Modified H-Bridge Transformerless PhotoVoltaic Neutral-point-clamped inverter with constant common mode voltage

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***Abstract*—Nowadays, transformerless PV inverters (TPVI) are more popular due to its excellent features such as lower in size, cost and higher in efficiency, as compared with conventional inverters. Undoubtedly it leads dangerous leakage current via stray capacitors to the ground, which results higher current ripples and problems related to electromagnetic interference (EMI). Therefore, a several configurations have been proposed with reduced leakage current and constant common-mode voltage (CMV). In this paper a modified H-bridge structure is proposed with rectifier circuit at mid-point of the dc-link capacitor to keep constant CMV in the whole grid cycle namely M-HB topology. The theoretical findings of the M-HB inverter are tested through simulation results. At the end a fair comparative analysis is presented.**

Keywords— Transformerless PV inverter, H-bridge inverter, stray capacitors, common-mode voltage and leakage current.

I. Introduction

In present market, photovoltaic (PV) energy is more favourable due to increased population and industries [1]- [2]. Recently, PV installations are incorporated with the grid connected systems due to its robustness, decreased cost and high in efficiency. In grid connected PV applications inverters are enormous role to convert the direct current (DC) to the alternating current (AC). Based on the operating principles, it can be classified into two types namely with transformer inverter and without transformer inverter or transformerless PV (TPV) inverters. Due to the demerits of with transformer such as an additional transformer is required for isolation purpose, which leads to increased size, weight, cost and poor efficiency [3]. Aforementioned issues can be overcome via TPV inverters but issues related with galvanic isolation are highlighted due to absence of the transformer between the PV to the grid [4].

In the literature, several topologies and corresponding control strategies have been introduced and published [5]-[7] to incorporate a super-junction metal-oxide-semiconductor field-effect transistors (SJ-MOSFETs) in TPV inverter design. The MOSFET solutions are extremely dominating in the present industry as compared with IGBT because the turn-off loss caused by tail current is mitigated. Here a few basic H4 based configurations are reviewed first to observe the common-mode behaviour and leakage current performance in grid-tied applications. By placement of the decoupling switches into the basic H4 structure, SMA H5 topology becomes more popular in the market, as shown in Fig.1. (a). So that it can realized with three MOSFETs (S2, S4, S5) and two IGBTs (S1, S3) for high efficiency applications. The decoupling switch S5 is used to isolate the PV and the grid during freewheeling periods.

Another attractive structure for high efficiency application is Heric topology by sunways, as shown in Fig.1(b). It can be realized with four MOSFETS (S1-S4) and two IGBTs (S5, S6), which are placed on the grid side to provide the galvanic isolation during freewheeling periods. Another topology namely a hybrid-bridge (HB) [8] structure is realized with six MOSFETs and two diodes by using decoupling scheme, as shown in Fig.1. (c). However, the major issues in H5, Heric and HB structures are floating CMV and hence higher leakage current. It can be confirmed that only galvanic isolation is not able to eliminate the complete leakage current due to the effect of switches' junction capacitances and stary parameters.

Further, a neutral-point-clamped (NPC) structures are introduced to overcome the issues in decoupling topologies (H5, Heric and HB), namely H-bridge zero voltage rectifier (HBZVR), H-bridge zero voltage rectifier diode (HBZVR-D), as shown in Fig.1. (d) and Fig.1. (e). In HBZVR, the clamping branch is made with a rectifier bridge (S1-S4, D1-D4) including one additional diode (D5) at midpoint of the dc-link and hence oscillating CMV during the freewheeling periods. As a result, leakage current is not eliminated completely. Similarly, in HBZVR-D the structure is similar to HBZVR except in the clamping branch such as adding a one extra diode (D6) at midpoint of the dc-link and hence constant CMV with low leakage current.

An improved HB (I-HB) structure, which is similar to the HB except in clamping branch such as realized with two switches (S7, S8) at mid-point of the dc-link, as shown in Fig.1(f) [9]. Nonetheless, it has a higher switching count during the freewheeling periods and hence poor system efficiency. So, from the above discussions, it is revealed that, CMV clamping structures are more versatile and leading in the present market PV applications [10].

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Hardware Implementation and MATLAB Simulation of Automatic power factor correction

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Abstract: Power factor is one of the major important concerns in the field of power quality engineering. Power factor is a measure of how we are using our electric energy in more efficient way. Since it plays critical role on every electrical appliance, many researches are going on to improve power factor. Low power factor leads to high capital expenditures and operating cost for distribution utilities which in turn may impose penalty charges in the form of higher tariff charges on electric consumers. This paper presents the automatic power correction by installing real time hardware by automatically switching on the required capacitive banks on observing the phase difference between voltage and current and also comparing the results with MATLAB/SIMULINK.

Keywords: automatic Power factor correction, capacitive banks, choosing capacitor capacity.

1. INTRODUCTION:

In the field of power system engineering, it is mandatory requirement to have voltage regulation and power factor in permissible limits. Power factor is defined as the ratio of active power to the apparent power in any electrical installations. It is also defined as the phase difference between voltages and currents in ac systems which are expressed in the fig.1. It acts as one of the good indicators in the load current on the efficiency of the supply system.

Suppose, if a system is running with lower power factor, it draws heavy current than required normal current and causes voltage drops which results to the excessive heating of electric components over the system and thus causes damage to the equipment. The main cause of lower power factor is increase in power electronic loads, evolvement of larger industries with growing demand.

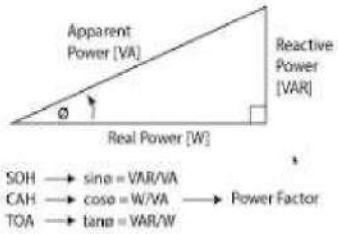

Fig.1 Power triangle

Improvement in power factor not only gives efficient power, but also decreases the cost and increase the durability of equipment. The benefits of improving power factor[1][2] are 1. Avoiding power factor penalties-As most of the industries use high capacity induction motors, conveyors and other machinery equipment. 2. Chance of getting low power bill-since distribution utilities are imposing penalties for recording lower power factor. 3. Increase in load carrying capabilities in electric circuits- as some loads are capable of drawing reactive power. 4. Improved voltage- by installing required capacitor banks across the loads improves power factor. 5. Reduced losses in power system.

2. POWER FACTOR CORRECTIONS

There are some standard techniques for improvement of power factor. Of course many techniques are published in various papers[3][4][5].

Static Capacitors- This method is mostly used in factories by connecting capacitors in parallel with the equipment operating at lagging power factor. The static capacitor draws a leading current or neutralizes the lagging reactive component produced by the

Present Day Lithium Ion Battery

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***Abstract*—Lithium-ion battery is potentially to be adopted as energy storage system for green technology applications due to its high-power density and high energy density. An accurate battery model in simulation platform is very important to design an efficient battery-powered system. In this paper, an electrical battery model is developed in MATLAB/Simulink.**

Keywords—Li-ion Battery, BMS, SOC, Matlab/SImulink

I. INTRODUCTION

A battery is a device that converts the chemical energy into electrical energy by means of an electrochemical reaction called oxidation - reduction (redox). Each oxidation and reduction reactions are associated with the standard cell potential E^0, which can be calculated from the thermodynamic information as follows,

$$E^0 = (-\Delta G)/zF$$

Where, ΔG standard Gibbs fiee energy, z - number of electrons exchanged and F- faraday constant. The overall theoretical cell voltage ΔE^0 is obtained by subtracting the negative electrode potential $E^{0(-)}$ from the positive electrode potential, $E^{0(+)}$.

$$\Delta E^0 = E^{0(+)} - E^{0(-)}$$

Although the term "Battery" often used, the basic unit is called electrocl~emical cell.

Batteries are one of the earliest technologies in the field of energy storage. A battery consists of several cells which is called electrochemical cells. A battery consists of anode, cathode and electrolyte. The process consists of flowing of electrons from cathode to anode and ions from anode to cathode across the cell through the electrolyte. A battery may contain "n" number of cells. The storage capacity of battery is expressed in Ampere hours (Ah).

The important parameters of batteries are state of charge (S.o.C), state of discharge (S.o.D), Voltage, Current, Power density, Energy Density etc. The capacity of a battery is expressed as

$$Q = I*t \qquad (1)$$

Where I= Current and t = time of charge /discharge.

TABLE I. COMPARISON OF PB-ACID, NI-MH AND LI-ION PERFORMANCE:

	Pb-acid	Ni-MH	Li-ion
Theoretical			
Voltage (v)	1.93	1.35	4.1
Specific Energy (Wh/Kg)	166	240	410
Practical			
Specific Energy (Wh/Kg)	35	75	150
Energy Density (Wh/L)	70	240	400
Coulometric efficiency	0.80	0.65-0.70	>0.85
Energy efficiency	0.65-0.70	0.55-0.65	~0.80
Power density (W/L)	450	>300	>800

In recent years, the rechargeable battery market further expanded and tends to increase continuously. The worldwide sales for Li ion portable batteries is 63% and it is larger than those of Ni-Cd (23%) and Ni-MH (14%), which indicates that lithium battery technology receives most attention. Ever growing demand for batteries lead the industry and government liberally invest in battery research and development. The investment of industry is focused on improving battery technology for communication, mobile electronics and computer technology, whereas majority of government funded research is for military, spacecraft, transportation, etc. Requirement for improving the battery properties included cyclability, reversibility, high energy, power density, safety, environmental impact, lower cost, etc. Hence, a wide range of materials (anodes, cathodes and electrolytes) have been developed and investigated for the improved lithium battery technology.

II. LITHIUM BATTERIES

Lithium is the lightest of metals and it floats on water. It also has the greatest electrochemical potential which makes it one of the most reactive of metals. These properties give Lithium the potential to achieve very high energy and power densities permitting batteries with very long useful life and small cell packages.

Li-ion batteries are commanding a greater market share owing to their high energy density, which makes them attractive for applications where weight or volume are important (e.g., HEVs). They have a long cycle life (>500 cycles) and low self-discharge rate (<10% per month). High initial cost has limited their use in price-sensitive applications, but new chemistries and economies of scale promise to reduce the cost of Li-ion batteries in the future.

Fig 1 shows a schematic diagram of an Li-ion cell. A lithium metal oxide (LiMO2), where M stands for a metal such as Co, and lithiated carbon (Li_xC) are the active materials in the positive and negative electrodes, respectively. The metal in the positive electrode is a transition metal, typically Co. The active materials are bonded to metal-foil current collectors at both ends of the cell and electrically isolated by a microporous polymer separator film or gel-polymer. Liquid or gel-polymer electrolytes enable lithium ions (Li^+) to diffuse between the positive and negative electrodes. The lithium ions insert into or de insert from the active materials via an intercalation process.

In the positive electrode during charge, the active material is oxidized and lithium ions are de-intercalated as follows:

$$Li_{1-x}CoO_2 + xLi^+ + xe^- \underset{\text{charge}}{\overset{\text{discharge}}{\rightleftharpoons}} LiCoO_2. \qquad (1)$$

In the negative electrode during charge, the active material is reduced and lithium ions that migrate from the positive electrode and through the electrolyte and separator are intercalated in the reaction

Control of Two Level Converter based STATCOM with Battery and Ultracapacitor

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***Abstract* — Integration of renewable energy based Distributed Generation (DG) units into the Electrical Distribution Network (EDN) has attained significant interest to utilize the locally available resources. But, these DGs injects fluctuating power into the network which affects the voltage/frequency instability of the EDN. Thus, an energy storage system and reactive power compensating devices has to be employed in the EDN, to improve the voltage/frequency stability. A configuration for E-STATCOM has been presented in this paper, which has the ability to provide active and reactive power support together. The E-STATCOM is formed by distributing Hybrid Storage System (HSS) into a two-level Voltage Source Converter. To meet the high energy/power density requirements, battery and ultracapacitor have been employed as HSS. The issues related to integration of HSS with the two-level converter and the control methods to extract E-STATCOM features like active power support, voltage regulation are discussed in this paper. A super-twisting sliding mode control has been employed for the battery fed DC-DC converter to provide the required energy support. The performance of the proposed system and the associated control methods are verified through PSCAD/EMTDC simulation for a wind energy-based DG connected to EDN and the results show effectiveness of the E-STATCOM.**

Keywords— Bi-directional DC-DC converter, Fractional order sliding mode control, Hybrid storage system, STATCOM, Ultracapacitor, Wind energy generation.

I. INTRODUCTION

The increase in demand for energy and reduction of fossil fuels necessitate the generation based on Renewable Energy Resources (RER). Also, it is serving as an effective solution to use the locally available resources to meet the energy demands. Among the different types of renewable energy resources, wind and solar energy based generations are increased at double fold rate due to high conversion efficiency, ease of operation and low installation cost, etc. However, these resources generate fluctuating power due to stochastic nature of solar insolation level and wind velocity. The voltage and frequency stability of the existing EDN are affected by injecting the variable power generated by the DGs. Hence, for the improvement of system stability, strict grid codes have to be followed [1]. The following list presents some of the requirements during integration of large renewable energy resources into the grid [2],

- Reactive power support
- Harmonic filtering
- Active power smoothening
- Unbalance mitigation

To integrate the DG into the electrical distribution network, an interfacing converter is employed. They injects variable power into the grid due to MPPT operation. Due to limitation in their ratings, these converters are unable to provide the required grid codes at common coupling point. So, they are dedicated for active power injection only. Thus, to provide the above listed features, ancillary systems are to be employed [3]. The features, like reactive power support, harmonic filtering, etc. can be provided by a STATCOM [4]. An Energy Storage System (ESS) is also to be employed for active power support [5]. The use of two different systems (i.e, ESS and STATCOM) results in reduction of overall efficiency. At the Point of Common Coupling (PCC), an 'E-STATCOM' can be can be connected to supply the required grid codes [6].

An E-STATCOM can be formed by connecting an ESS with STATCOM, which has the capability to support active power for definite duration and also caters the power quality issues. In [7], the battery-based storage system is employed to smoothen the power generated by a Wind Energy Generation System (WEGS). The battery storage system is lumped at the dc-link of two-level converter and the systems supplies only active power at the PCC. Ultracapacitor based storage system to smoothen the wind power has been studied in [8]. Apart from the control of storage system in E-STATCOM, the most desirable features of an ESS are to support loads with high energy/power density. Also, they should have the other qualities like high operation efficiency, longer life span, low installation cost and less maintenance. Among the available storage systems like batteries, ultracapacitor (UC), pumped storage, fly-wheels, etc. [9], none of them alone is capable to deliver the features as state above. So, it is effective to combine two/more types of energy storage system to obtain the desired features. This kind of storage system is termed as HSS [10]. One such combinations of HSS is battery and UC. The performance of battery and UC based HSS for active power support in electric vehicles has been studied in [11]. The same configuration has been employed to improve the frequency regulation of a stand-alone microgrid, and its performance has been presented in [12].

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Hybrid Flying Squirrel Search Algorithm for solving the single objective optimization power flow problem in power system

85. HYBRID FLYING SQUIRREL SEARCH ALGORITHM FOR SOLVING THE SINGLE OBJECTIVES OPTIMAL POWER FLOW PROBLEM IN POWER SYSTEM

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In this paper, a novel and recently developed algorithm which is inspired by natural foraging phenomenon of the flying squirrel named as Squirrel Search Algorithm is used and it is hybridized with arithmetic crossover operation to enhance its effectiveness and being used for solving the single objectives optimal power flow problem (OPF) of power system. So, the proposed algorithm is named as Hybrid Flying Squirrel Search Algorithm (HFSSA). The capability and performance of the proposed algorithm is observed on benchmark test functions and on IEEE-30 bus system. Generation fuel cost, emission and transmission losses are considered as objectives of optimal power flow problem. The obtained results will be compared with the existing literature to justify the supremacy of the proposed method.

Performance enhancement of isolated forward converter using PI controller

Performance Enhancement of Isolated Forward Converter using PI Controller

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Abstract

Isolated Forward Converter is designed using standard topology, and commercially available application specific Integrated circuit. Methodology of choosing components, selection of values, design of magnetic like Inductors, Capacitors, and transformers has been expounded. The design is simulated on MATLAB software and tested. Mathematical Model for the above DC-DC converter is derived and a transfer function is obtained. The frequency response of the converter is plotted using MATLAB. Additional components for compensation based on frequency are also designed. The above design has been successfully tested on the hardware and waveforms at various points have been measured practically. Keywords: Forward Converter, PI Controller, TL3843.

I. Introduction

Modern electronic systems require high quality, small, light weight, reliable and efficient power supplies. Linear regulators can provide a very high quality output voltage. Their main area of applications is at low power levels as low drop-out voltage regulators. Electronic devices in linear regulators operate in their active (linear) mode. At high power levels switching regulators are used. Switching regulators use power electronic semiconductor switches in ON and OFF states. Since there is a small power loss in those states, switching regulators can achieve high energy conversion efficiencies. Modern power electronic switches can operate at higher frequencies resulting in smaller size of the transformer . A forward converter is discussed here as it is more energy efficient and used for higher power output applications ranging from 100W to 200W.The dc-dc converters can be classified into two categories:

- Isolated dc/dc converters
- Non-isolated dc/dc converters

A. Isolated Converters

This "isolation" refers to the existence of an electrical barrier between the input and output of the DC-DC converters. Isolation describes the electrical separation between the input and output of a dc-dc converter which uses a transformer to eliminate the dc path between its input and output and will have a high frequency transformer providing that barrier. This barrier can withstand anything from a few hundred volts to several thousand volts, as is required for medical application. A second advantage of an isolated converter is that the output can be configured to be either positive or negative.

B. Non-Isolated Converters

Non-isolated dc-dc converter has a dc path between its input and output. The non-isolated converter usually employs an inductor, and there is no dc voltage isolation between the input and the output. Battery-based systems that don't use the ac power line represent a major application for non-isolated dc-dc converters. For lower voltages (12V) non-isolated buck converters can be used. Non-isolated dc-dc converter designs usually employ ICs specifically intended for that purpose.

II. Isolated Forward Converter

In this the source ground and load ground are electrically separated but magnetically coupled then the circuit is said to be isolated one. The output voltage in forward converter depends on the duty ratio and also on the turn's ratio of the transformer.

Optimized control technique of Active power filterin 25kv Electric Traction System

Optimized Control Technique of Active Power Filter in 25KV Electric Traction System

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bstract

AC railway traction systems undergoes to armonic distortions due to unbalanced voltages nd currents. These single-phase networks have CR-based electric locomotive drives which ntinually change their point of connection on the twork. Active power filters are the only effective ntrol strategy is to inject harmonic compensating rrents derived from harmonic voltages measured the point of common coupling. This paper shows w synchronously rotating frames helps us to tract individual harmonic voltages to act as rrent injection references. This paper discusses e evaluation of performance of control strategy sing MATLAB/ Simulink.

Keywords-Active power filter, Harmonic oltages, Electric Locomotive Drive

Introduction

In industrial, commercial and residential applications, power electronic equipment's connected to the er systems, such as switched power supply, cyclo-nverters, inverters for driving AC motors, controlled d non-controlled rectifiers for driving DC motors, nong are widely used.

AC electrified railway systems consist of a 25KV dicated 1-phase supply network from which the comotives draw power. In early days electric comotive are driven by DC motors which requires a yristor-based rectifier converters to provide voltage ntrol. These types of locomotives, which are still in rvice not only draw a significant amount of lagging ad current at the fundamental frequency but also inject vere levels of harmonic current. The currents enerated by these nonlinear loads can degrade the power quality (PQ) in the electrical power systems by distorting utility of voltage. The harmonic currents injected by electric locomotives can result in a range of traction system problems, including trackside over-voltages, increased voltage form factor and excessive low order harmonic currents being fed back into the HV supply. Figure.1 illustrates the pantograph voltage waveform obtained at the end of a 35km feeder section loaded with four 2.5MW locomotives operating at full power. The voltage waveform shows a resonant over-voltage and an increased voltage form factor.

The increasing of non-linear loads makes the use of active power filters an interesting way to eliminate harmonic currents as well as reactive power compensation. The harmonic currents injected by electric locomotives can result in a range of traction system problems, including trackside over-voltages, increased voltage form factor and excessive low order harmonic currents being fed back into the HV supply. Figure.1 illustrates the pantograph voltage waveform obtained at the end of a 35km feeder section loaded with four 2.5MW locomotives operating at full power. The voltage waveform shows a resonant over-voltage and an increased voltage form factor.

Resonant over-voltages may leads to failures of equipment connected to the system, while an increase in form factor means that the maximum power available to each locomotive is reduced. To reduce this voltage distortion, some form of filtering action is required. The topology proposed in this paper is to use a shunt active filter.

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Geothermal Power Generation: Global Updates

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***Abstract*— The demand for electric power is increasing day-by-day with the population in the world. The supply of power is unable to meet the demands. So, in order to bridge the gap between supply and demand switching over to alternate sources of energy is inevitable, that too renewable. Geothermal energy is one of which the world can rely on. Geothermal is the natural heat of the earth and is derived from the decay of radioactive elements in the earth's crust and transferred to the subsurface by conduction and convection. This paper presents the global status of geothermal energy and contributions from various countries. This paper also emphasizes the merits of geothermal energy over other renewable, which generate electricity.**

Keywords— Geothermal Power, Installed Capacity, Global

I. INTRODUCTION

The word 'geothermal' is derived from the Greek words 'thermal' which means heat and 'geo' which means earth. This energy comes from deep inside the earth where the earth's core is hotter than the sun's surface. Geothermal energy is generated in the earth's core almost 4000 miles underneath the earth's surface. It is called a renewable energy source, because the water is replenished by rainfall and the heat is continuously produced deep within the earth. The slow decay of radioactive particles in the earth's core produces geothermal energy. This process is natural in all rocks. Due to this process, very high temperatures are continuously produced inside the earth. Wells can be dug and hot water can be pumped to the surface. People around the world use available geothermal energy to maintain the temperatures inside the homes warm and to produce electricity. Geothermal electricity generation requires hot water or steam at high temperatures of the order (300°F to 700°F) range to be drawn from deep inside the earth. This requires deep well to be drilled which may act as a reservoir of energy.

The geothermal power plants all over the globe use the naturally available hot water and steam from the earth's interior to turn turbine generators for producing Electricity. For centuries, geothermal springs have been utilized for bathing, heating and cooking. Only in the early 20th century, people started to consider geothermal energy as a practical source of energy with huge potential. Apart from heating, geothermal energy is now used to produce electricity. Some other applications include cooling buildings as well as for other industrial purposes like fruit and vegetable cultivation.

World energy demand increased by 2.1% in the year 2020 relative to 0.9% in the year 2019[1]. This rise is mainly supported by fossil fuels, but these fuels are depleting day-by-day. In addition to this, CO2 emissions are not contained which is resulting in Global Warming. Temperature increases with depth in the earth at an average of 25°C/km. If the average surface temperature is 20°C, the temperature at 3km depth would be in the order of 95°C. Among all the energy sources, geothermal energy presents one of the most eco- friendly and clean energies. This is due to its lowest emission of greenhouse gases and also because it is a cost-effective energy source with the potential to replace conventional fossils for electricity generation and heating [2]. Most of the world's energy potential of geothermal sources account for the deposits with a fluid temperature below 130°C [3]. Volcanoes, hot springs, geysers and fumaroles are some of the visible features of geothermal energy. The most active geothermal resources are usually found along major tectonic plate boundaries where earthquakes and volcanoes are concentrated. Most of the geothermal activity in the world occurs in an area called the Ring of Fire [4] as shown in Figure.2. This area borders the Pacific Ocean.

The sequence of steps involved in building a large geothermal power project is represented in the block diagram as shown in Figure.1.

There are three types of geothermal power plants: (i) dry steam power plants (ii) flash steam power plants and (iii) binary cycle power plants. Among all these types, flash steam power plants are widely used to generate geothermal fueled electric power.

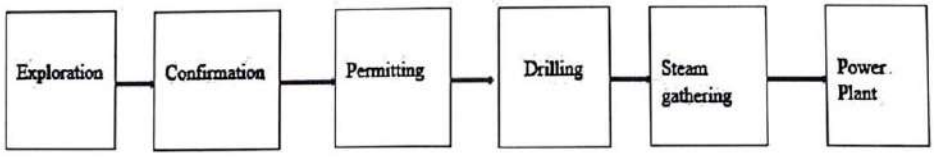

Figure 1. Block diagram representing various steps.

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Compressed Sensing Based Mixed Noise Cancellation in Passive Bistatic Radar

D. Venu & N. V. Koteswara Rao

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481 Accesses

Part of the Learning and Analytics in Intelligent Systems book series (LAIS,volume 9)

Abstract

This paper proposes a unique compressed sensing based pathway to improve mixed noise cancellation in Passive Bistatic Radar (PBR). Mixed noise is considered as Additive White Gaussian Noise (AWGN) including Impulse Noise (IN). The proposed technique applies a best sparsifying basis that adapts to the structure of the problem and reduces the size of the measurement matrix drastically. According to simulation results, it has been confirmed that the proposed system gives higher state estimation

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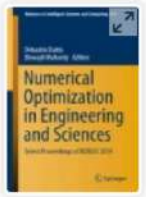
Predictive Data Optimization of Doppler Collision Events for NavIC System



Numerical Optimization in Engineering and Sciences pp 583–589

Predictive Data Optimization of Doppler Collision Events for NavIC System

P. Sathish & D. Krishna Reddy

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Abstract

Navigation with Indian Constellation (NavIC) is satellite-based navigation system developed by Indian Space Research Organization (ISRO), India. It consists of seven satellites, among them, three are geostationary (GEO) satellites, and the rest are geosynchronous satellites. There are several factors that effect the positional accuracy of the NavIC system, and among them, one of the important parameter is Doppler collision (DC). The occurrence

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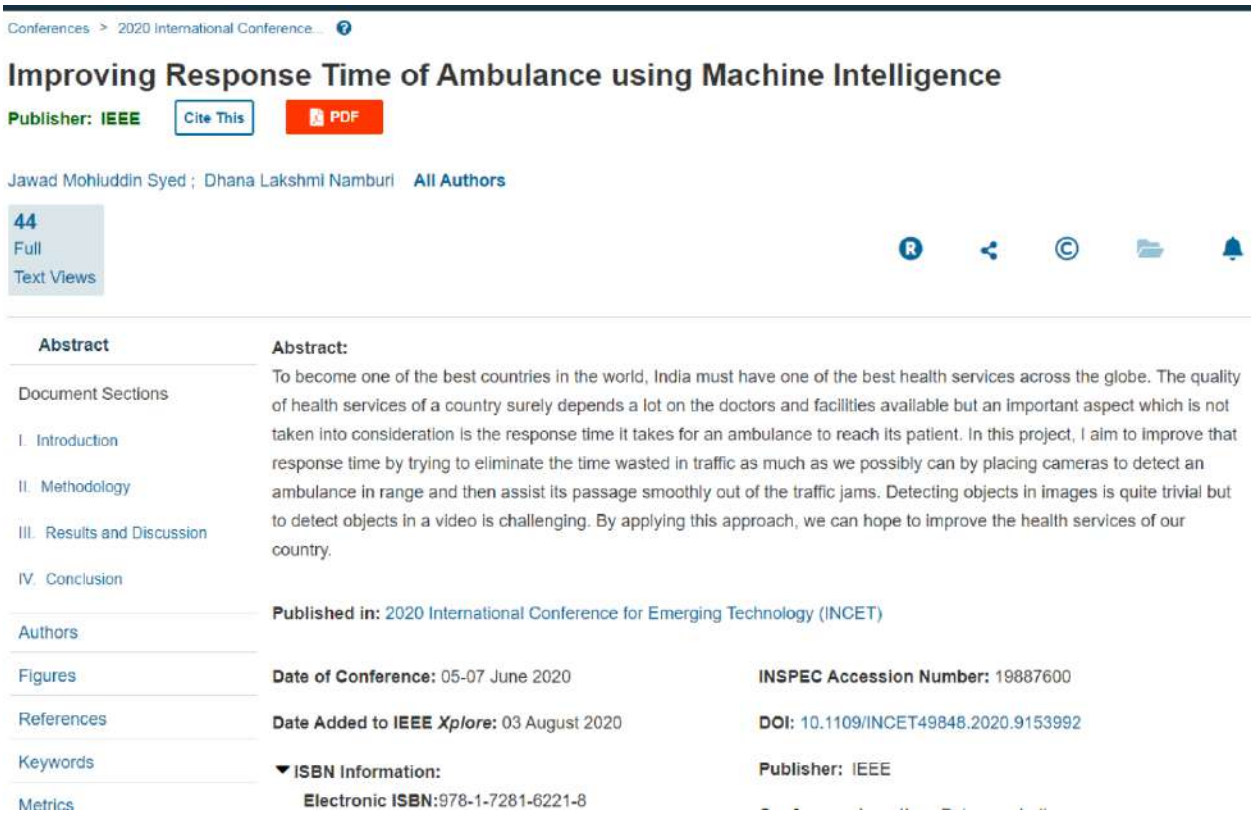
"Improving Response Time of Ambulance using Machine Intelligence"



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Improving Response Time of Ambulance using Machine Intelligence

Publisher: IEEE | Cite This | PDF

Jawad Mohiuddin Syed ; Dhana Lakshmi Namburi All Authors

44 Full Text Views

Abstract

Document Sections

I. Introduction

II. Methodology

III. Results and Discussion

IV. Conclusion

Authors

Figures

References

Keywords

Metrics

Abstract:
To become one of the best countries in the world, India must have one of the best health services across the globe. The quality of health services of a country surely depends a lot on the doctors and facilities available but an important aspect which is not taken into consideration is the response time it takes for an ambulance to reach its patient. In this project, I aim to improve that response time by trying to eliminate the time wasted in traffic as much as we possibly can by placing cameras to detect an ambulance in range and then assist its passage smoothly out of the traffic jams. Detecting objects in images is quite trivial but to detect objects in a video is challenging. By applying this approach, we can hope to improve the health services of our country.

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"Preliminary Analysis of Doppler Collision Occurrence in Various Kinematic Conditions for NavIC System"

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S.NO.6

2020 IEEE International Students' Conference on Electrical, Electronics and Computer Science

Preliminary Analysis of Doppler Collision Occurrence in Various Kinematic Conditions for NavIC System

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Abstract: **India has designed it's own regional navigational system, NavIC(Navigation with Indian Constellation) which is the operational name of Indian Regional Navigation Satellite System(IRNSS) developed by ISRO. It consists of seven satellites out of which four are geosynchronous and three are geostationary satellites. All the satellite based navigation systems are prone to errors induced by troposphere, ionosphere, difference in timing clocks used and relative motion between the satellites and user. One such phenomenon that introduces tracking errors due to geostationary satellites is 'Doppler Collision'. The impact of Doppler Collision(DC) is significant for precise user position estimation in static and various dynamic conditions. The aim of this paper is to analyze the Doppler Collision occurrence in kinematic conditions for various DLL(Delay Locked Loop) bandwidths. An efficient algorithm needs to be developed for the analysis of Doppler Collision in order to minimize the tracking errors. It is found that DC occurs for 33.4 minutes in 1C and 1G whereas 5.88 minutes in between 1C and 1F and for 6.416 minutes in between 1F and 1G satellites.**

Keywords: Doppler Collision(DC), NavIC, dynamic conditions, geostationary satellites(GEO)

I. INTRODUCTION

Global Navigation Satellite System(GNSS) is a satellite based navigation system that estimates the position, velocity and timing of the user anywhere on the globe. This term is a combination of GPS, Galileo, GLONASS, Beidou, NavIC and other regional systems[1] Indian Regional Navigation Satellite System (IRNSS) is an independently developed satnav system, designed controlled by the Indian Space Research Organization (ISRO). NavIC provides precise real-time positioning services covering India and extend upto 1,500 km around it. The system presently consists of a constellation of seven active satellites. Three of those seven satellites in constellation are geostationary satellites (GEO) and four are geosynchronous satellites(GSO) [2].The main difference between GSO and GEO is in their inclinations with respect to the equator of the earth. Geosynchronous satellites will have more inclination where as geostationary satellites will have very less or no inclination at all with respect to the equatorial plane of the earth. An IGS(IRNSS GPS SBAS) receiver has been established in the NCRC laboratory, ECE department, CBIT, Gandipet, Hyderabad. The IGS receiver operates on two frequencies L5(1176.45MHz) & S1(2492.028MHz). The receiver also operates with GPS & SBAS(GAGAN) signals in L1(1575.42MHz).

One of the main errors to which all global and regional satellite systems are prone to is Doppler Collision. Doppler Collision is a phenomenon seen in code-division multiple access(CDMA) systems. The code measurement errors which are developed in GNSS as a result of cross correlation between two or more satellites is due to the occurrence of Doppler Collision. When the relative Doppler between two satellites is less than the receiver DLL bandwidth then Doppler Collision may occur. When the difference in distance between the auto correlation and cross correlation peaks is less than 24dB, then the receiver cannot distinguish between them resulting in Doppler Collision[6]. Thus the receiver views one satellite to be another and tracking errors are caused. In NavIC geostationary satellites are used due to which Doppler Collision will happen twice a day and last several minutes and even more. The lower the relative doppler will be, the longer the interference will be significant and more will be the error in position[4]. The important parameters that contribute to Doppler Collision is Relative Doppler and the other parameters are Relative code delay, Signal power, Relative carrier phase, Cross Correlation function and Message data[8]. Occurrence of DC depends on the mentioned six parameters but the necessary condition for it's occurrence will have to be the relative Doppler being less than the receiver code loop bandwidth.When the Doppler of two satellites are equal, it is possible to introduce a multipath-like error into the tracking of the correlation peak[9].

The receiver position is not significantly effected in low dynamic conditions because of less doppler shift. But in high dynamics, the receiver position is highly erroneous because the Doppler shift value changes rapidly. In high dynamic true receiver position can be found by controlling the performance parameters of the receiver. In low dynamics the typical Doppler range for standard GPS receiver is ±7KHz and in high dynamics, the variation of doppler frequency will be in the range of ±100KHz with a doppler rate of 1Hz/s and 100Hz/s respectively. Precise point positioning applications

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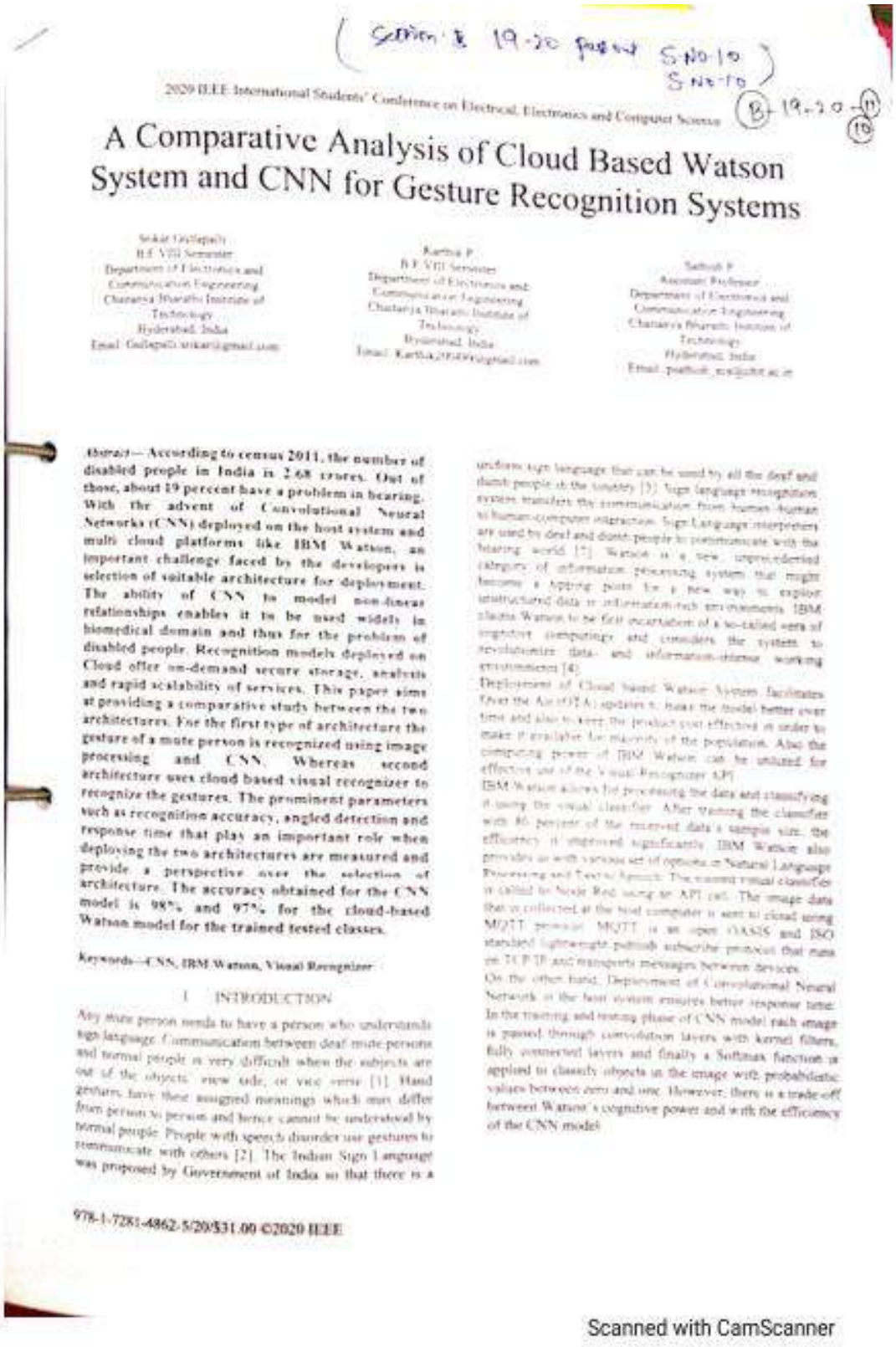
" A comparative analysis of Cloud based Watson System and CNN for Gesture Recognition Systems"



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A Comparative Analysis of Cloud Based Watson System and CNN for Gesture Recognition Systems

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Abstract— **According to census 2011, the number of disabled people in India is 2.68 crores. Out of those, about 19 percent have a problem in hearing. With the advent of Convolutional Neural Networks (CNN) deployed on the host system and multi cloud platforms like IBM Watson, an important challenge faced by the developers is selection of suitable architecture for deployment. The ability of CNN to model non-linear relationships enables it to be used widely in biomedical domain and thus for the problem of disabled people. Recognition models deployed on Cloud offer on-demand secure storage, analysis and rapid scalability of services. This paper aims at providing a comparative study between the two architectures. For the first type of architecture the gesture of a mute person is recognized using image processing and CNN. Whereas second architecture uses cloud based visual recognizer to recognize the gestures. The prominent parameters such as recognition accuracy, angled detection and response time that play an important role when deploying the two architectures are measured and provide a perspective over the selection of architecture. The accuracy obtained for the CNN model is 98% and 97% for the cloud-based Watson model for the trained tested classes.**

Keywords—CNN, IBM Watson, Visual Recognizer

I INTRODUCTION

Any mute person needs to have a person who understands sign language. Communication between deaf mute persons and normal people is very difficult when the subjects are out of the objects' view side, or vice versa [1]. Hand gestures have their assigned meanings which may differ from person to person and hence cannot be understood by normal people. People with speech disorder use gestures to communicate with others [2]. The Indian Sign Language was proposed by Government of India so that there is a uniform sign language that can be used by all the deaf and dumb people in the country [3]. Sign language recognition system transfers the communication from human-human to human-computer interaction. Sign Language interpreters are used by deaf and dumb people to communicate with the hearing world [7]. Watson is a new, unprecedented category of information processing system that might become a tipping point for a new way to explore unstructured data in information-rich environments. IBM claims Watson to be first incarnation of a so-called era of cognitive computing and considers the system to revolutionize data- and information-intense working environments [4].

Deployment of Cloud based Watson System facilitates Over the Air (OTA) updates to make the model better over time and also to keep the product cost effective in order to make it available for majority of the population. Also the computing power of IBM Watson can be utilized for effective use of the Visual Recognizer API.

IBM Watson allows for processing the data and classifying it using the visual classifier. After training the classifier with 80 percent of the received data's sample size, the efficiency is improved significantly. IBM Watson also provides us with various set of options in Natural Language Processing and Text to Speech. The trained visual classifier is called by Node Red using an API call. The image data that is collected at the host computer is sent to cloud using MQTT protocol. MQTT is an open OASIS and ISO standard lightweight publish subscribe protocol that runs on TCP/IP and transports messages between devices.

On the other hand, Deployment of Convolutional Neural Network in the host system ensures better response time. In the training and testing phase of CNN model each image is passed through convolution layers with kernel filters, fully connected layers and finally a Softmax function is applied to classify objects in the image with probabilistic values between zero and one. However, there is a trade-off between Watson's cognitive power and with the efficiency of the CNN model.

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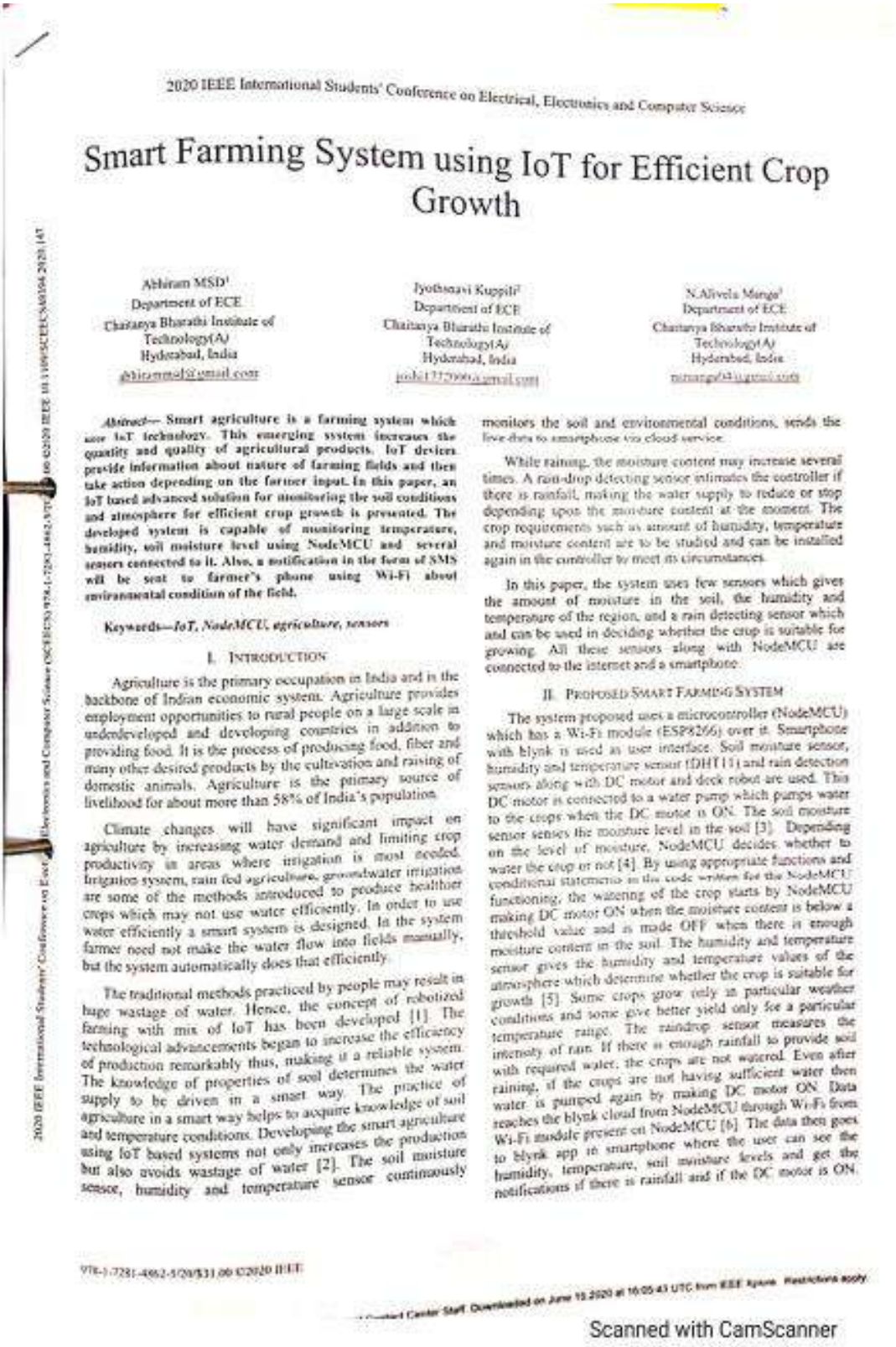
"Smart Farming System using IoT for Efficient Crop Growth"



2020 IEEE International Students' Conference on Electrical, Electronics and Computer Science

Smart Farming System using IoT for Efficient Crop Growth

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***Abstract*— Smart agriculture is a farming system which uses IoT technology. This emerging system increases the quantity and quality of agricultural products. IoT devices provide information about nature of farming fields and then take action depending on the former input. In this paper, an IoT based advanced solution for monitoring the soil conditions and atmosphere for efficient crop growth is presented. The developed system is capable of monitoring temperature, humidity, soil moisture level using NodeMCU and several sensors connected to it. Also, a notification in the form of SMS will be sent to farmer's phone using Wi-Fi about environmental condition of the field.**

Keywords—*IoT, NodeMCU, agriculture, sensors*

I. Introduction

Agriculture is the primary occupation in India and is the backbone of Indian economic system. Agriculture provides employment opportunities to rural people on a large scale in underdeveloped and developing countries in addition to providing food. It is the process of producing food, fiber and many other desired products by the cultivation and raising of domestic animals. Agriculture is the primary source of livelihood for about more than 58% of India's population.

Climate changes will have significant impact on agriculture by increasing water demand and limiting crop productivity in areas where irrigation is most needed. Irrigation system, rain fed agriculture, groundwater irrigation are some of the methods introduced to produce healthier crops which may not use water efficiently. In order to use water efficiently a smart system is designed. In the system farmer need not make the water flow into fields manually, but the system automatically does that efficiently.

The traditional methods practiced by people may result in huge wastage of water. Hence, the concept of robotized farming with mix of IoT has been developed [1]. The technological advancements began to increase the efficiency of production remarkably thus, making it a reliable system. The knowledge of properties of soil determines the water supply to be driven in a smart way. The practice of agriculture in a smart way helps to acquire knowledge of soil and temperature conditions. Developing the smart agriculture using IoT based systems not only increases the production but also avoids wastage of water [2]. The soil moisture sensor, humidity and temperature sensor continuously monitors the soil and environmental conditions, sends the live data to smartphone via cloud service.

While raining, the moisture content may increase several times. A rain-drop detecting sensor intimates the controller if there is rainfall, making the water supply to reduce or stop depending upon the moisture content at the moment. The crop requirements such as amount of humidity, temperature and moisture content are to be studied and can be installed again in the controller to meet its circumstances.

In this paper, the system uses few sensors which gives the amount of moisture in the soil, the humidity and temperature of the region, and a rain detecting sensor which and can be used in deciding whether the crop is suitable for growing. All these sensors along with NodeMCU are connected to the internet and a smartphone.

II. Proposed Smart Farming System

The system proposed uses a microcontroller (NodeMCU) which has a Wi-Fi module (ESP8266) over it. Smartphone with blynk is used as user interface. Soil moisture sensor, humidity and temperature sensor (DHT11) and rain detection sensors along with DC motor and desk robot are used. This DC motor is connected to a water pump which pumps water to the crops when the DC motor is ON. The soil moisture sensor senses the moisture level in the soil [3]. Depending on the level of moisture, NodeMCU decides whether to water the crop or not [4]. By using appropriate functions and conditional statements in the code written for the NodeMCU functioning, the watering of the crop starts by NodeMCU making DC motor ON when the moisture content is below a threshold value and is made OFF when there is enough moisture content in the soil. The humidity and temperature sensor gives the humidity and temperature values of the atmosphere which determine whether the crop is suitable for growth [5]. Some crops grow only in particular weather conditions and some give better yield only for a particular temperature range. The raindrop sensor measures the intensity of rain. If there is enough rainfall to provide soil with required water, the crops are not watered. Even after raining, if the crops are not having sufficient water then water is pumped again by making DC motor ON. Data reaches the blynk cloud from NodeMCU through Wi-Fi from Wi-Fi module present on NodeMCU [6]. The data then goes to blynk app in smartphone where the user can see the humidity, temperature, soil moisture levels and get the notifications if there is rainfall and if the DC motor is ON.

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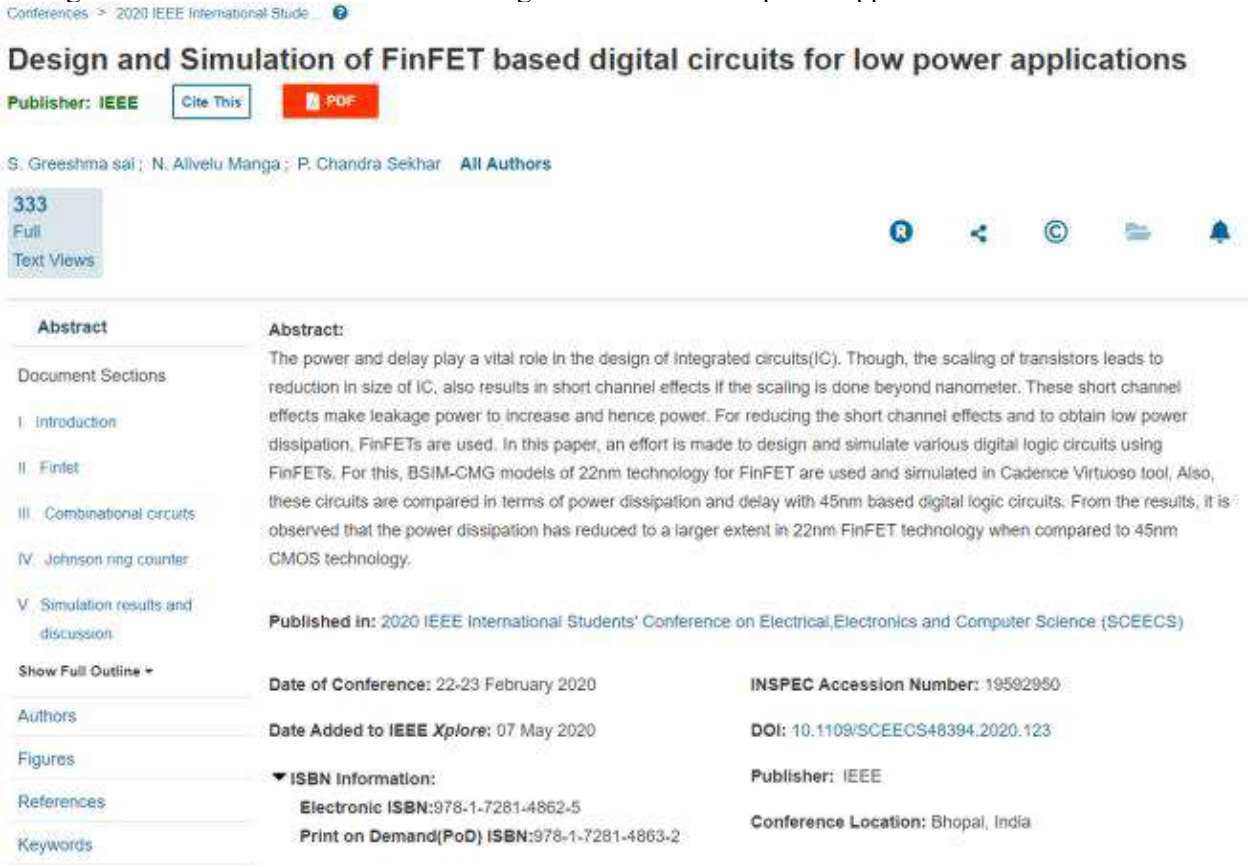
"Design and Simulation of FinFET based digital circuits for low power applications"



Conferences > 2020 IEEE International Stude

Design and Simulation of FinFET based digital circuits for low power applications

Publisher: IEEE | Cite This | PDF

S. Greeshma sai ; N. Alivelu Manga ; P. Chandra Sekhar All Authors

333 Full Text Views

Abstract

Document Sections

I. Introduction

II. Finfet

III. Combinational circuits

IV. Johnson ring counter

V. Simulation results and discussion

Show Full Outline

Authors

Figures

References

Keywords

Abstract:
The power and delay play a vital role in the design of integrated circuits(IC). Though, the scaling of transistors leads to reduction in size of IC, also results in short channel effects if the scaling is done beyond nanometer. These short channel effects make leakage power to increase and hence power. For reducing the short channel effects and to obtain low power dissipation, FinFETs are used. In this paper, an effort is made to design and simulate various digital logic circuits using FinFETs. For this, BSIM-CMG models of 22nm technology for FinFET are used and simulated in Cadence Virtuoso tool. Also, these circuits are compared in terms of power dissipation and delay with 45nm based digital logic circuits. From the results, it is observed that the power dissipation has reduced to a larger extent in 22nm FinFET technology when compared to 45nm CMOS technology.

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DOI: 10.1109/SCEECS48394.2020.123

Publisher: IEEE

Conference Location: Bhopal, India

"Detection of Multiple closely spaced Targets in Low SNR Conditions using MUSIC Algorithm"

Detection of Multiple Closely Spaced Targets in Low SNR Conditions using MUSIC Algorithm

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Abstract: Radar is an electromagnetic system used for detecting, locating and tracking targets. To enhace the multi target detection capability of digital receivers in Electronic Warfare applications, high resolution algorithms are required. Multiple signal classification (MUSIC) is one of such prominent algorithm, but its performance is degraded in the presence of noise and when the targets are in close proximity.Therefore, in this paper MUSIC algorithm is modified at two stages.In the first stage Savitzky Golay filter is used as Pre-processing filter and at next stage noise removal technique is used for estimating the target eigenvalues and frequencies. The results showed that proposed algorithm is capable of distinguishing 3 targets with Signal to Noise Ratio (SNR) of upto -12 dB and 4 targets with SNR of -9dB with good range resolution compared to available literature. Optimized computation complexity of the proposed method is making it as superior compared to other methods.

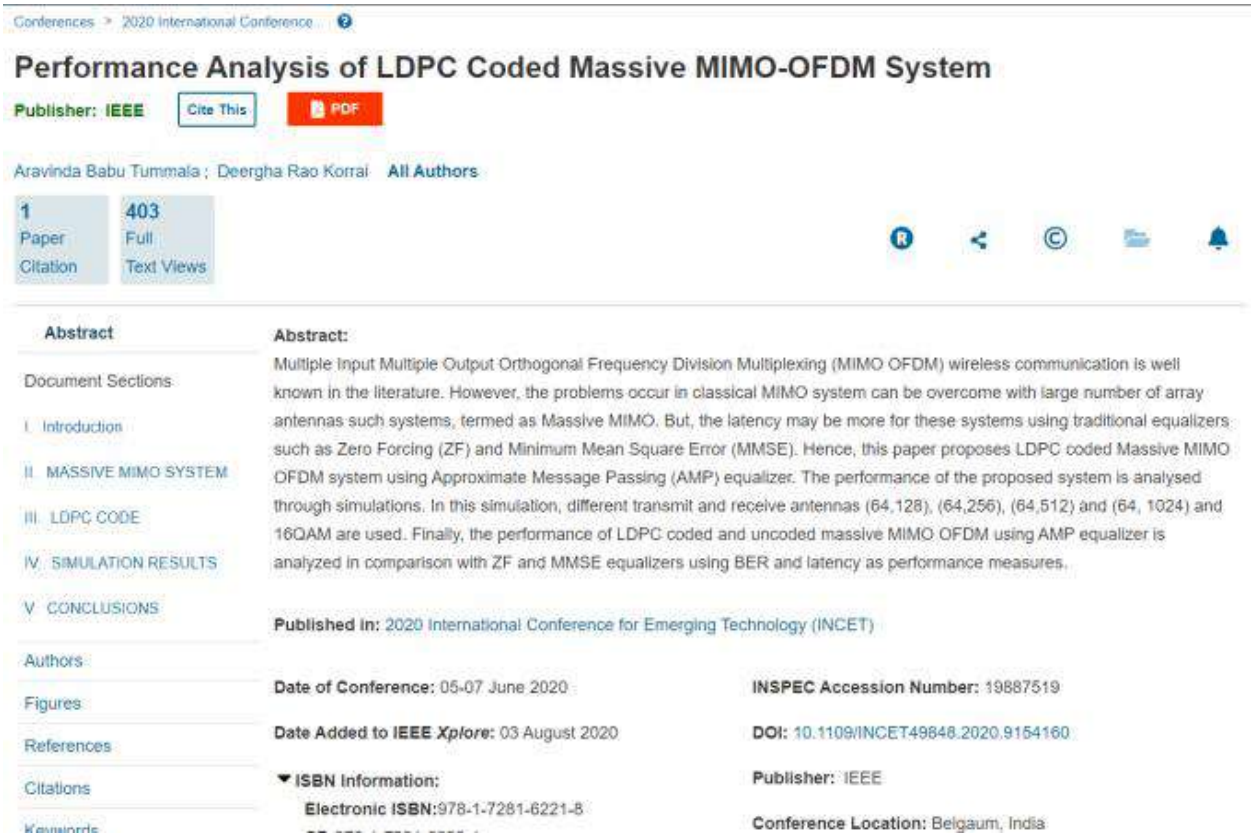
Keywords—MUSIC; Savitzky Golay filter; Range resolution; Eigenvalue Decomposition;Spectrum estimation; Electronic Warfare.

1. INTRODUCTION

Today's electronic warfare scenario has become very complex and many users of radar are employing (Low Probability of Intercept) LPI as tactical requirement. In order to intercept and process the LPI signals, advanced signal processing techniques are required. LPI Radar plays a major role in the Electronic Warfare field [1]-[3]. It also determines the range, altitude, direction or speed of both stationary and moving objects such as aircrafts, ships and motor vehicles. High Resolution Range profile (HRRP) is one of the important features used in Automatic Target Recognition (ATR)[4]-[6]. FFT is the initial signal detection algorithm to identify the frequencies which are in fine range, but if the two input signals are close in frequency, it is difficult to separate them by using FFT. In that case, high resolution spectrum estimation techniques should be employed for that particular portion of data.Several types high resolution approaches such as Linear prediction,Prony's model,MUSIC and ESPRIT methods are used to estimate frequencies from input data[7]-[9].To identify the correct frequencies using high resolution algorithms , the actual input should be processed. In linear prediction method (all-pole method) selection of correct filter order is the main issue. When the order of the filter is not proper, the spectrum does not produce the peaks at the input signal frequencies correctly.For digital receivers, it is very important to identify the number of target signals without

"Multiply-Accumulate unit for Binary Arithmetic using high speed adders and PIPO Accumulator"

"Performance Analysis of LDPC Coded Massive MIMO-OFDM System"



Conferences > 2020 International Conference

Performance Analysis of LDPC Coded Massive MIMO-OFDM System

Publisher: IEEE | Cite This | PDF

Aravinda Babu Tummala ; Deergha Rao Korrai All Authors

1 Paper Citation | 403 Full Text Views

Abstract

Document Sections

I. Introduction

II. MASSIVE MIMO SYSTEM

III. LDPC CODE

IV. SIMULATION RESULTS

V. CONCLUSIONS

Authors

Figures

References

Citations

Keywords

Abstract:
Multiple Input Multiple Output Orthogonal Frequency Division Multiplexing (MIMO OFDM) wireless communication is well known in the literature. However, the problems occur in classical MIMO system can be overcome with large number of array antennas such systems, termed as Massive MIMO. But, the latency may be more for these systems using traditional equalizers such as Zero Forcing (ZF) and Minimum Mean Square Error (MMSE). Hence, this paper proposes LDPC coded Massive MIMO OFDM system using Approximate Message Passing (AMP) equalizer. The performance of the proposed system is analysed through simulations. In this simulation, different transmit and receive antennas (64,128), (64,256), (64,512) and (64, 1024) and 16QAM are used. Finally, the performance of LDPC coded and uncoded massive MIMO OFDM using AMP equalizer is analyzed in comparison with ZF and MMSE equalizers using BER and latency as performance measures.

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Publisher: IEEE

Conference Location: Belgaum, India

"Turbo code with Hybrid interleaver in the presence of impulsive Noise"

“Mixed image denoising using weighted coding and non-local similarity”

SpringerLink

Research Article | Published: 01 May 2020

Mixed image denoising using weighted coding and non-local similarity

V. V. Satyanarayana Tallapragada, N. Alivelu Manga, G. V. Pradeep Kumar & M. Venkata Naresh

SN Applied Sciences 2, Article number: 997 (2020) | Cite this article

873 Accesses | 4 Citations | Metrics

Abstract

Denoising an image is a heuristic and objective process. Still, underlying noise that is predominant in the images reduces the quality. Additive white Gaussian noise (AWGN) and impulse noise are the most exploited types of noise. For a specified amount of density, a combination of AWGN and impulse noise may distract the entire signal causing a loss in the magnitude. This paper presents a denoising model by exploiting such a combination that uses an overcomplete dictionary by sparse based denoising scheme with suitable regularization terms. A weight matrix is defined to optimize the operation at specific locations of the image. Finally, the use of non-local similarity features improves the quality of reconstructed images. The weight matrix maps the regions where the effect of multiple noise sources is present. The results proved the superiority of the proposed technique. Simulation of the proposed technique on many images with different quantities of noise produced an improvement of up to 2 dB when the noise effect is more when compared to the state-of-the-art techniques.

18

Significance of festivals and understanding Cultural heritage

Nagadevi Darapureddy

Abstract

Festivals are impalpable cultural assets maintaining the past and passing them to the future generations. Festivals are eloquent to indicate culture, traditions, and heritage. Festivals are celebrated irrespective of caste and religion in the country. It creates relations and a strong bond in humanity. It builds social relations and social communication which leads to unity among the people. The present generation will come to know about our customs and old-age practices during these celebrations. Various festivals have religious inchoation and entwine cultural and religious paramountcy in traditional activities. Festivals can accommodate tourism advantages such as increased visitation and development of a destination's image. Communities experience arrange of benefits from festivals. These benefits include building social cohesion, providing a specific time and place for families and friends to show their commitments to the area, and to provide a socially acceptable area for publications. The main aim of this article is to represent the significance of festivals, the main festival which is celebrated grandly in every state

Proceedings of the Fourth International Conference on Microelectronics, Computing and Communication Systems pp 799–813

Diabetes Diagnosis Prediction Using Ensemble Approach

Kavita Agrawal ✉, G. Bhargav & E. Spandana

Conference paper | First Online: 20 September 2020

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 673)

Abstract

Diabetes is considered as one of the most dangerous diseases in the world. It may also aid in causing heart attacks, blindness, etc. So, instead of taking medication for a long time after it has occurred, it is better if we can predict its occurrence at an early stage so as to prevent it. In this paper, we have used an ensemble approach using multiple classifiers to predict the result. We have trained the dataset using a number of classifiers. The dataset used in this paper is based on the parameters that are likely to cause diabetes in India. We got accuracies of each model

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Security tool for IOT and Image compression techniques

[illegible]

Security tool for IOT and IMAGE compression techniques

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Abstract

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

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

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

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

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

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

Interactive Learning in Mixed Reality

XVI International Conference on Recent Trends in Engineering, Applied Science and Management
Osmania University Centre for International Program, Hyderabad (India) TEAM-18
19th May 2018 www.conferenceworld.in ISBN: 978-93-87793-26-2

Interactive Learning in Mixed Reality (May 2018)

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ABSTRACT

Mixed reality is the result of blending the physical world with the digital world. It is the next evolution in human, computer, and environmental interaction and unlocks possibilities that before now were restricted to our imaginations. It is made possible by advancements in computer vision, graphical processing power, display technology, and input systems. Microsoft HoloLens is the first self-contained, holographic computer, enabling to engage with the digital content and interact with holograms in the world. Specialized components—like multiple sensors, advanced optics, and a custom holographic processing unit—enable us to go beyond the screen. We present a method of utilizing the HoloLens for advanced learning in Mixed Reality. One methodology of achieving this goal is, when a user is reading a book while wearing the HoloLens, if the user comes across a word which he/she has no idea about, then the user taps on the word using a tapping gesture, this will be recognized by the HoloLens. It then uses Optical Character Recognition (OCR) tools to recognize the word. The next step is to use the word and look up using Google search APIs to get relevant results. The most relevant result will be chosen and is prepared to be rendered as a hologram. The user can interact with the hologram to understand more about it, to have a look from all angles etc.

Keywords:*Annotations, HoloLens, Mixed Reality, Optical Character Recognition, User interfaces*

1. INTRODUCTION

The purpose of this project is to understand and make use of the HoloLens' sensual and natural interface commands, interface with them and connect them to make learning interactive. The entire system is categorized under Mixed Reality [1], implying that the application is superimposed onto the real world. The underlying idea behind the project is to interface with a standalone wearable system, and to develop an application for the HoloLens, using Unity and Visual Studio. The main contribution would be to detail how an application for the HoloLens can be built with the use of available resources.

1.1. Problem Definition

The problem definition is as follows, Interactive Learning in Mixed Reality is to make learning interactive by leveraging the Microsoft HoloLens[2]. Interactivity is achieved by letting the user of the application

Concatenated Global Average Pooled Deep Convolutional Embedded Clustering

ICDSMLA 2019 pp 778–786

Concatenated Global Average Pooled Deep Convolutional Embedded Clustering

Morarjee Kolla & T. Venugopal

Conference paper | First Online: 19 May 2020

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 601)

Abstract

Deep Clustering learns cluster friendly salient features in embedded space. In our previous work of Global Average Pooled Deep Convolutional Embedded Clustering (GAPDCEC) algorithm, the last convolution layer feature maps are pooled to build the embedded space. This considers only spatial information retains in the last convolution layer of the encoder, which unable to capture discriminative features from entire convolutional layers. To address this issue, we propose a solution using concatenation of all convolutional layer outputs and then Global Average

Assoc. Prof. Vinit Kumar Gunjan

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Applications of iot for soil quality

International Conference on Intelligent Computing and Communication Technologies

ICICCT 2019: **ICICCT 2019 – System Reliability, Quality Control, Safety, Maintenance and Management** pp 277–286

Applications of IoT for Soil Quality

K. Spandana & Suresh Pabboju

Conference paper | First Online: 28 June 2019

1091 Accesses | **4** Citations

Abstract

The farming industry has become more important than ever before in the next few decades. Farmers and agricultural companies are turning to the Internet of Things (IoT) to meet demand. Since we need to continuously take measures manually it requires large amount of time. So using this Smart Agriculture we can effectively take the measurements in less amount of time. In this Smart Agriculture sensors can provide continuous measurements with respect to climate changes. Using Internet of things we can produce different ways to cultivate soil. Smart Agriculture and Smart Farming applications will help

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Smart Computing Paradigms: New Progresses and Challenges pp 245–257

Image Filter Selection, Denoising and Enhancement Based on Statistical Attributes of Pixel Array

Vihar Kurama & T. Sridevi

Conference paper | First Online: 01 December 2019

229 Accesses

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 766)

Abstract

The choice of image filters in computer vision has a significant effect on the image reconstruction and feature extraction. Currently, the most filters are used to enhance images for human consumptions, programmed operations and to reduce the noise, frequency levels in the image. Though it is hard to select an optimal set of filters for a given series of images, in this work, we propose to choose the best assortment of different filters for a given image as the input. By generating the pixel array of the input image, we compute all the image attributes such as

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Dr. Sambit Bakshi

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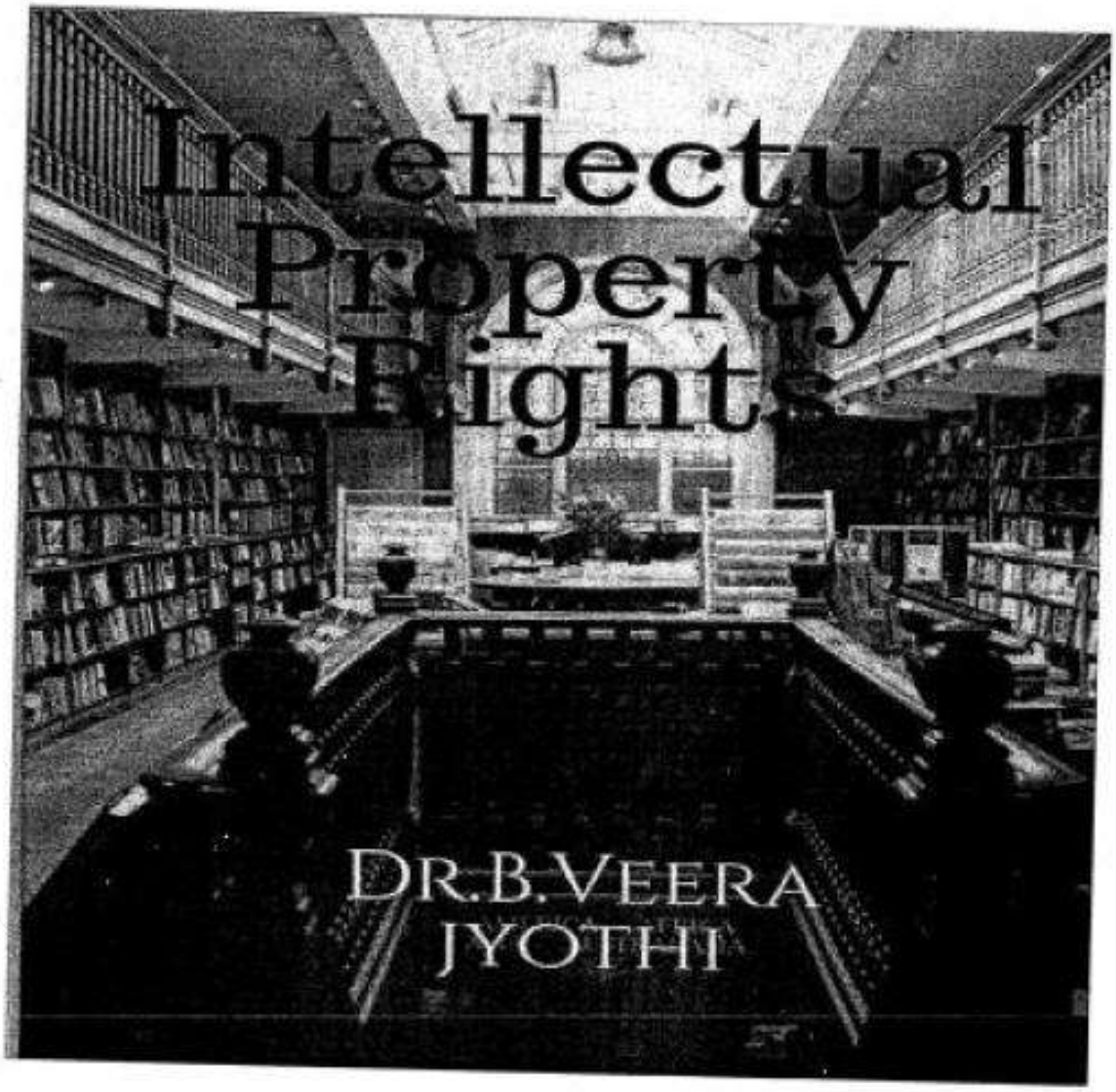
Intelligent Technologies and Robotics (R0)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Production And Operation Management

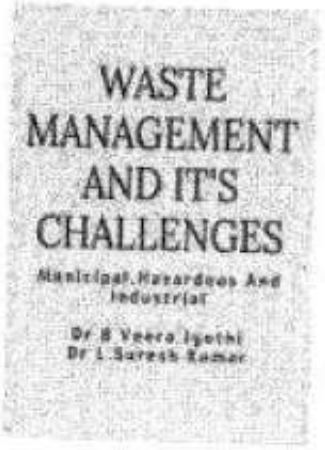
Production and Operations Management Paperback – 14 February 2020

by Dr. L. Suresh Kumar (Author) Dr. B. Veera Jyothi (Author)

Paperback

10 Days Replacement Only

This book discusses about product design and product planning



Waste management and its challenges

municipal, hazardous, industrial

₹ 1095

214 OriginalPaper | Chapter

Phishing URL Detection Using Machine Learning Techniques

Authors: A. Sirisha, V. Nihitha, B. Deepika

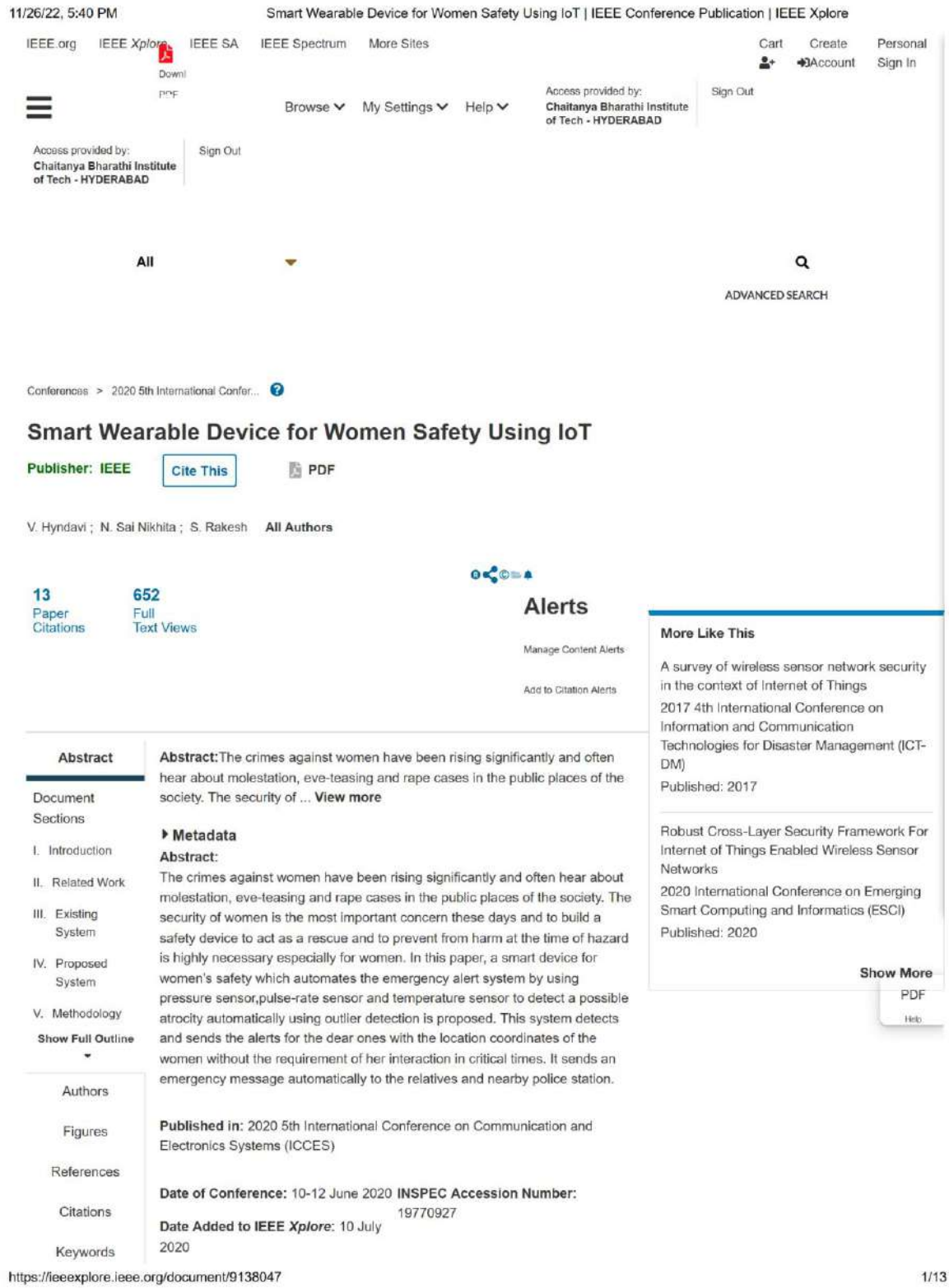
Publisher: Springer Singapore

Published in: ICCCE 2020

Abstract

A criminal act performed online by impersonating others to obtain confidential data like passwords, banking details, login credentials, etc., is known as phishing. Detecting such websites in real-time, is a complex and dynamic problem, which involves too many factors. This work focuses on identifying the important features that distinguish between phishing URLs and legitimate URLs. To detect significant features, statistical analysis is done on the phishing as well as legitimate datasets. Based on the statistical exploration, certain features based on the URL, HTML, JavaScript and Domain were extracted. The prominent and most relevant features to identify the phishing URLs are identified using correlation. The identified subsets of features are then used to train different machine learning based classifiers and the accuracies obtained have been compared. From the experimental analysis it is observed that the extracted features have efficiently detected phishing URLs and the Decision Tree classifier has found with highest accuracy for making the predictions.

Smart Wearable Device for Women Safety using IoT



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Contents

SECTION I.
Introduction

Women are the most integral part of any economy primarily responsible to shape the future of the country. Many crimes against them are not being reported because of society's hypocritic point of view. Various types of humiliations and mistreatment are being faced by the victims who try to report their as saults from society. Only one of four cases lead to conviction trails in India.

Proper precautions should be taken to to build the best solution to this problem This paper proposes an IoT based smart wearable for the safety of women. The device is used to automatically detect such situations and inform the related persons. It not only helps women escape critical situations but also ensures to provide justice to the women by helping them in times of need.

SECTION II.
Related Work

The research of S. A. More [1] discusses using temperature sensors and pulse rate sensors to automatically detect a chance of a possible situation and notify family and friends using a mobile application. [2] discusses the usage of image processing to detect any possibility of danger and proposes various solutions to protect herself. In [3] the authors developed a device which employed PIC16F876A microcontroller and a SIM808 module, which has GPS, GSM and GPRS support which are used to notify the friends and family when the emergency button is pressed. In [4] a system based on the facial features is developed. If the facial expression is a threat-based expression then a report is filed. About [5], GSM and GPS are used to build a safe device. In this system, the message is sent to pre-stored mobile numbers which consist of the body posture of the victim along with her location. In [6] independent triggering of android application and arm device takes place with the help of synchronized Bluetooth connection. The audio and video that have been recorded are sent to the phone numbers which are pre-set in the application along with the location in the form of a call and also a message to alert them In [7], an android app is developed which

CBIR using SIFT with LoG, DoG and PCA

Data Engineering and Communication Technology pp 623–637

CBIR using SIFT with LoG, DoG and PCA

Katta Sugamya, Pabboju Suresh, A. Vinaya Babu & Rakshitha Akhila

Conference paper | First Online: 09 January 2020

668 Accesses

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 1079)

Abstract

Content based image retrieval using scale invariant feature remodel (SIFT) is employed to discover stable keypoint locations within the scale-space. The extraction of image options can be done by exploiting SIFT or K-means cluster. In the proposed work we can find feature extraction and locating scale-space extrema through SIFT-DoG & SIFT-LoG ways. Finally, planned ways, SIFT-DoG, SIFT-LoG, and PCA are compared.

Keywords

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Load Balancing in Cloud Through Multi Objective Optimization

Advances in Decision Sciences, Image Processing, Security and Computer Vision pp 293–300

Load Balancing in Cloud Through Multi Objective Optimization

S. Jyothsna & K. Radhika

Conference paper | First Online: 13 July 2019

Part of the Learning and Analytics in Intelligent Systems book series (LAIS,volume 3)

Abstract

The Scheduling and Load balancing in cloud is considered as NP complete problem where the tasks are assigned to the cloud are dynamic in nature so the heuristic approach can be followed to find the solution. Load balancing directly affects the reliability, response time, through put and energy efficiency of a server. The optimized solution for load balancing should consider various objectives like minimizing energy consumption and minimum execution time so that reduced cost. Balancing the load across cloud servers is possible through virtual machine (VM)

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ICCCE 2020 pp 1093–1103

A Mining Framework for Efficient Leakage Detection and Diagnosis in Water Supply System

P. Vasanth Sena ✉, Sammulal Porika & M. Venu Gopalachari

Conference paper | First Online: 12 October 2020

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 698)

Abstract

A smart city smart meter water grid have to be reliable and capable to safeguarding the 24 * 7 trustworthy water distribution network that guarantees less wastage by leakages in the pipeline. Distributors and Consumers are turning to the Internet of Things and deep learning to meet requirement. Continuously monitoring the system and taking requirements manually is tedious job. Smart nodes with hall sensors provide continuous measurements and warehoused in database captured

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Interviewee Performance Analyzer Using Facial Emotion Recognition and Speech Fluency Recognition

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***Abstract*—Analysis of the performance of an interviewee is a complex and challenging task. Our proposed system automates this process by building two multiclass classification models. Video captured during an interview is given to the proposed system which extracts frames and Audio from it. Frames are given to the first model which is a facial emotion recognition model it uses HaarCascade classifier, Gabor filters, and Convolution Neural Network for classification of facial emotion as one of these seven emotions like Happy, surprise, angry, disgust, neutral, fear, sadness. Audio is given to the second model which uses Mel frequency cepstral coefficient features and logistic regression for speech classification as four classes Fluent, Stuttering, Cluttering, and Pauses. Predictions of these two models can be combined to give a performance rating for the interviewee. Compared to only CNN based and Deep Neural Network based facial emotion recognition, the Gabor Filter based approach which we have used gave better accuracy with a smaller number of hidden layers and less training time.**

***Keywords*—Gabor Filters, Convolution Neural Networks, Deep Neural Networks, Logistic Regression, HaarCascade Classifier, Mel Frequency Cepstral Coefficients**

I. INTRODUCTION

The traditional way of interviewing candidates is a costly, time taking process and leads to interviewer biases. The interviewer needs to investigate the facial emotions, fluency, gestures, etc. Using an automated system for the process of interviewing candidates doesn't lead to any kind of biases. Even after the candidate is selected for a role, we can still access the candidate performance while he/she is interacting with customers, clients, and teams. Facial emotion recognition is used in different applications like analyzing the performance of a candidate in an interview, drowsiness detection in cars which is used for safe driving, apathy detection, customer reviews link analyzing the emotional state of a person while playing a newly developed video game.

There are different approaches for performing facial emotion recognition but the approach which we are using in this research gives very good accuracy compared to existing techniques because we are using Gabor filters and CNN based approach which is very efficient in performing emotion recognition by training model in very less time which even requires very few hidden layers.

We aim to develop an automated system that can analyse performance of an interviewee. Facial emotion recognition alone is not sufficient for this task along with it we need to perform speech fluency recognition, which tells whether the speech is fluent, Stuttering, Cluttering, has pauses, etc. Speech fluency recognition is performed by extracting a kind of features called as MFCC features, after extracting these MFCC features classifications of speech can be done using one of the algorithms like logistic regression, support vector machine, MLP networks.

II. LITERATURE SURVEY

We have referred several research papers for Facial Emotion Recognition but out of all the techniques involved in Facial Emotion Recognition and Speech Fluency Recognition only Gabor filter-based Techniques [6], MFCC based Audio Classification [3] [8] gave good accuracy. Gabor filters are used in image processing techniques and are used for texture analysis and edge detection [4]. Gabor filters can be used in face recognition, emotion recognition which results in good accuracy compared to other techniques in face detection and discovered that it has various applications and can also used in image recognition [1],[6]. Speech Signal Can be classified by Artificial Neural Networks, Logistic Regression, Support Vector Machine [9]. We have found that Human emotion recognition is used in various domains like job interviews, education, Market Research, Medicine [10]. Facial emotion recognition using CNN [2] is got at recognizing emotions accurately compared to Gabor Filter based technique. MFCC features can be used for classification of music into three classes Rock, Pop, Classic [3], so it can also be used for speech fluency recognition. PyAudio library can be used to extract MFCC features easily and these features can be used for Classification of speech using Classification Algorithms [2].

III. DATASETS

The datasets used for Facial Emotion Recognition are FER2013 dataset and ck+ dataset. FER2013 dataset contains nearly 35800 images, it is distributed as 4953 images- anger, 547 images- disgust, 5121 images- fear, 8989 images- happy, 6077 images- sad, 4002 images- surprise and 6198 images- neutral. ck+ dataset contains around 700 images and it is distributed as 100 images for each emotion type. 80% of images from each dataset are used for training and the remaining 20% of images are used for testing the Facial Emotion Recognition model.

For Speech fluency recognition we have collected fluent speech data from 2 datasets Speech Accent Archive,

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A Study on IoT Applications Towards Impact of Loss of Data

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Abstract-- In IoT environment, the data will be collected from multiple sensors and then it is processed by using data processing workflows and transform these data as per the requirements of the application. New ways should be devised to handle the continuation of data that is to be delivered to applications without having the applications wait for the sensor to recover throughout the data transformation process if one of the sensors is unable to create data due to an environmental / technical problem. This is the way to minimize the time gap of retrieving the loss data from sensor. It's like in networks if a packet is lost in internet, the destination system asks for the retransmission of packet, which consumes more time. Instead of that, a mechanism should be devised to handle the lost data from sensors. In this perspective, the proposed research work discusses about some applications of IoT and also the impact of data loss.

Keywords: Linear Discriminant Analysis [LDA], multi sensor structure, data fusion, Internet of Things [IoT], real-time traffic monitoring, GPS navigation system, hybrid systems.

I. INTRODUCTION

IoT is a platform, where it contains the global network with connected devices, which can collect data and share the information to be used by the applications. A formal definition of Internet of Things (IoT) is a growing network of physical objects and devices, called "Things," as well as individuals. IoT enables many sensors to interconnect with each other for transmitting the data without human intervention, due to which it influencing the nations by various applications like smart cities, smart meter, smart home, healthcare monitoring systems, intelligent cars, smart manufacturing plant, and real-time traffic monitoring, air quality detection in environment, forecasting applications etc. [1] Every one of the above applications have a unique thing to achieve, based on the domain application need sensors are deployed and they are called as sensing applications mentioned in figure 1 which have the ability of sensing the devices that are associated with the sensors to monitor by capturing the data.

we can have many IoT home automation benefits like control on smart energy management, controlling remote home appliances, even in the areas like agriculture we can do live stock monitoring and higher crop quality and better yields in the case of smart cities we can enhance the energy efficiency, traffic management and elimination of crime.

Figure 1: IoT Applications in different fields

Rest of the paper is organized as follows In section 2 related work proposed by different authors and in section 3 loss of data in some applications are discussed, where loss of data is not an issue for GPS navigation system on the other hand health care systems in medical field the loss of data matters and we have shown with a simple case study of regression analysis to predict home ownership based on age and educational background and Pima Indians Diabetes Dataset analysis in section 4, In section 5 conclusion.

The main Objective of these paper is to emphasize how missing data leads to different problems in data analysis and the motivation is to describe the problems with missing data and how if we have multiple sources to collect same type of data gives a better performance.

II. RELATED WORK

Sensor Management for IOT in Smart Home discussed by Prafulla Kumar Choubey [8] proposed an idea of how to do sensor management and reduce the power and bandwidth is given good accuracy. The methodology described here is when They introduced an architecture on small scale and found that output of some sensors can be predicted from the other sensors because instead of keeping all the sensors active if we able to find the dependency between physical factors. Also, this model provides fault tolerance to certain degree as the value of faulty sensor can be predicted until it is replaced and decision can be taken based on that.

Evolution of Permafrost: An Impact on The Socio-Economic Conditions

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Date Written: February 7, 2020

Abstract

In the present technological era, climate change has become the word of the hour. Since 1970, Climate Change has been in discussion and that its adverse effects should be reduced by 2100. But these climate change effects have been observed and felt predominantly since the past 10 years. One such effect is the thawing of permafrost. Permafrost, being an integral component provides stability to the land around the Arctic regions. But, due to thawing of 2,000-43,000 years old permafrost structures around Alaska and Siberia, has resulted in instability triggering in loss of millions of dollars. Due to the unstable nature there has been a historic, economic and cultural revolution in the regions present around the arctic. The permafrost has also been considered as the last remnants of the Ice age and is also a prominent source of the Paleontological remains. Permafrost depletion is a dynamic effect which results in a misnomer to regular people. Due to such changes in permafrost, nature of water, ecosystems and also communities living on the permafrost land will be primarily affected. Therefore, this resulted in release of greenhouse gases and also

Evolution of Permafrost: An Impact on The Socio-Economic Conditions

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Abstract:

In the present technological era, climate change has become the word of the hour. Since 1970, Climate Change has been in discussion and that its adverse effects should be reduced by 2100. But these climate change effects have been observed and felt predominantly since the past 10 years. One such effect is the thawing of permafrost. Permafrost, being an integral component provides stability to the land around the Arctic regions. But, due to thawing of 2,000-43,000 years old permafrost structures around Alaska and Siberia, has resulted in instability triggering in loss of millions of dollars. Due to the unstable nature there has been a historic, economic and cultural revolution in the regions present around the arctic. The permafrost has also been considered as the last remnants of the Ice age and is also a prominent source of the Paleontological remains. Permafrost depletion is a dynamic effect which results in a misnomer to regular people. Due to such changes in permafrost, nature of water, ecosystems and also communities living on the permafrost land will be primarily affected. Therefore, this resulted in release of greenhouse gases and also caused bubbling effect in 72 lakes around Alaska. Thawing of permafrost creates a staggering impact as they contain 1600 billion tons of carbon dioxide and methane stored globally within which 150 billion tons of carbon dioxide and methane is expected to be released by 2100 which is tantamount to the amount of greenhouse gases released by USA alone by the burning of fossil fuels. Acceleration of the adversity of climate change is being observed due to the effects caused by nature and fossil fuels which in turn results in difficulties in sustainability of living beings. Depletion of permafrost also results in land sliding into the sea simultaneously resulting in erosion of 2-5 meters of land per year.

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Online Education: Challenges in Rural Areas of India

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Abstract: *The pandemic COVID-19 has paralyzed the traditional classroom teaching-learning process in India since March 2020. As soon as it is realized that it takes moths to get normalcy in education sector, everyone looked for an alternative, i.e., online classes. Starting from primary schools, high schools, colleges, higher education institutions and universities geared up to meet the needs of the enthusiastic learners. In towns and cities, conduction of online classes is receiving moderately good response. On the other hand, the scenario in rural and remote areas is quite different and needs to be addressed. Most of the rural people are under financial crisis due to loss of their employment or meagre earnings during this period. As the most of the educational institutions started direct online classes, the students need at least medium range smartphones or tabs or laptops. As these gadgets are expensive, the parents are unable to buy them for their children. This has been the main hindrance for online education in rural areas. Further, network connectivity issues also add to their woes*

AIP Conference Proceedings

As-deposited sol-gel made TiO_2-SiO_2 films as protective coatings for silver

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B. Manikya Pratima, K. Uday Kumar, and A. Subrahmanyam

As-deposited sol-gel made TiO_2-SiO_2 films as protective coatings for silver

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Abstract. Silver surface is prone for tarnish when exposed to sulfide and sulfate environments. Present work reports protection of silver surfaces with sol-gel derived mixed oxides of titanium-silicon (TiO_2-SiO_2) thin films prepared at room temperature (300K) by dip coating technique without any post annealing. 0.1M and 0.3M titania and silica individual sols are mixed in fixed volume to prepare 0.1M (TS1) and 0.3M (TS3) titania-silica mixed oxides. The corrosion measurements of the coated and un-coated silver surfaces have been evaluated by conventional electro-chemical measurements; alkaline Na_2S and Na_2SO_4 are the electrolytes. The corrosion rates have been estimated from Tafel plots. The titania-silica protective thin films have shown significant decrease in the corrosion rates: bare silver from 1.06mmpy to protected silver surface 0.07mmpy. Ti-O-Si covalent bonds are revealed in Raman spectra of the mixed oxide films. The present investigation shows that sol-gel derived titania-silica films protect the silver surface from alkaline sulfide and sulfate environment very effectively.

INTRODUCTION

Silver surface tarnishes when exposed to the sulphide[1] in the environment[1,2]. There are several inorganic and organic[3] materials used for the protective coats on silver: polymers, lacquers, Al_2O_3, silica and TiO_2 etc[4–7]. Titania (TiO_2) and silica (SiO_2) thin films, depending on the composition and the degree of homogeneity[3] exhibit unique optical, chemical and mechanical properties[8–12]. The earlier reports[13] on sol-gel titania-silica thin films indicate desired optical and mechanical properties; it is proposed in the present study to employ these titania-silica mixed oxide thin films as protective coatings on silver. Probably, ours is the first report on the use of these mixed thin films of titania and silica as protective coats on the silver surfaces [Indian Patent application number 201841035409 dated 21.09.2018].

The aim of the present work is to evaluate the barrier/protection properties of titania-silica thin films prepared by sol-gel technique (at 300K) on the silver surfaces exposed to sulfide and sulfate environments. Among the various techniques employed to prepare these titania-silica thin films, sol-gel has the advantage of relative ease of process control and the capability of large area coatings even on complex surfaces and is relatively cost-effective[14–18]. In general, the sol-gel derived thin films are subjected to post-deposition treatments, like, annealing at elevated temperatures and extended times to enhance the adherence, optical and mechanical properties[19,20]. There is a vast literature on this sol-gel derived titania-silica thin films; the literature cited is only indicative but not exhaustive. The novelty of the present work is that (i) sol-gel derived titania-silica thin films are used for the first time on silver surfaces and (ii) no post-deposition heat treatment has been conducted on the thin films.

EXPERIMENTAL

The precursors for the TiO_2 and SiO_2 sols are reagent-grade titanium tetraisopropoxide (TTIP) $Ti(OC_3H_7)_4$ (Spectrochem) and tetraethylorthosilicate (TEOS) $Si(OC_2H_5)_4$ (Sigma Aldrich), HCl (Merck) and ethanol (99.99% Merck). Briefly, the individual TiO_2 and SiO_2 sols (500ml) of 0.1M concentration are prepared by adding (with continuous stirring) 14.9ml of TTIP and 11.1ml of TEOS to ethanol respectively.0.3M individual TiO_2 and SiO_2 sols are also prepared in the same way. To prepare the mixed titania-silica sols, the individual sols of TiO_2 and SiO_2 in

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Assessment of Water Quality Index and Monitoring of Pollutants by Physico-Chemical Analysis in Water Bodies

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Assessment of Water Quality Index and Monitoring of Pollutants by Physico-Chemical Analysis in Water Bodies: A Review

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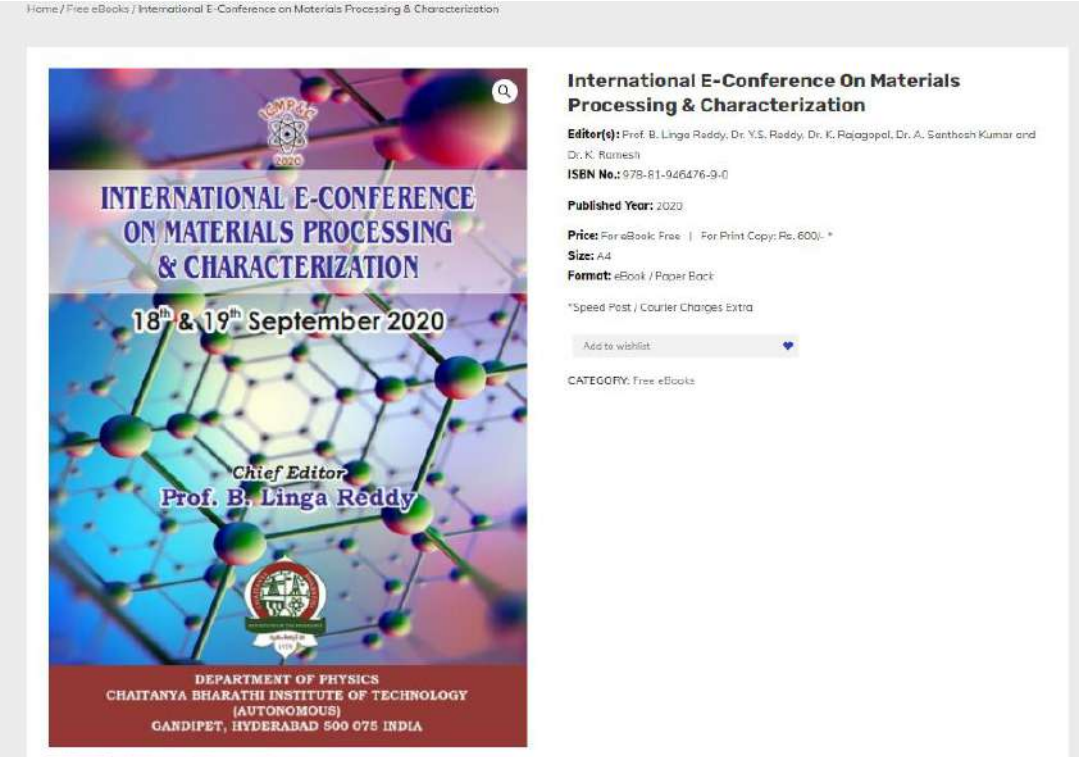
***Abstract*:- Water is said to be polluted when it is changed in its quality or composition directly or indirectly as a result of waste disposal and other human activities so that it becomes less suitable or harmful for drinking, domestic, agricultural, fisheries or other purposes. Water is never pure in a chemical sense. Even in the most unpolluted geographical areas, rainwater contains dissolved carbon dioxide, oxygen and nitrogen and may also carry in suspension dust or other particles picked up from the atmosphere.**

The existence of human society depends on water. The quality of water should be monitor regularly due to its necessary for good human health. If water will be contaminated and frequently used by living being for drinking purposes, then human population suffers from different of water borne diseases. The availability of good quality water is an indispensable feature for preventing diseases and improving quality of life, therefore it is necessary to know details study about different Physico-Chemical parameters such as temperature, Transparency ,hardness, pH, sulphate, chloride, DO, BOD, COD, alkalinity nitrates phosphates used for analysis and testing of water quality. It is necessary to address water quality issues with respect to different water bodies. In addition, since the advent of industrial era, there has been a dramatic increase in the demand for water, commensurate with population growth and improved living standards. In the present study, a review of literature on the quality of natural waters from different parts of Indian sub-continent, in particular, and the globe in general has been discussed briefly.

Keyword: Physico - chemical Parameters, Transparency, Hardness, Human health

INTRODUCTION

Modern civilization is dependent on water for irrigation, industry, domestic needs, shipping, sanitation and disposal of waste. Most of our water bodies such as ponds, lakes, streams and rivers have become polluted as a consequence of increasing industrialization, urbanization and other development activities. Water is said to be polluted when it is changed in its quality or composition directly or indirectly as a result of waste disposal and other human activities so that it becomes less suitable or harmful for drinking, domestic, agricultural, fisheries or other purposes. Temperature, turbidity and total suspended solids in water bodies can be greatly affected by human activities such as agriculture, deforestation and the use of water for cooling. The release of untreated domestic or industrial wastes high in organic matter into water bodies results in a marked decline in oxygen concentration and a rise in ammonia and nitrogen concentrations, downstream of the effluent input.[1] Industrial activities which discharge large organic loads include, pulp and paper production and food processing. Uncontrollable discharge of industrial waste water often causes pollution due to toxic metals. Other sources of metal pollution are leachates from urban solid waste landfills and mining waste dumps. Under certain hydrogeological conditions, unsewered domestic waste can cause severe ground water contamination by pathogenic bacteria, nitrate and other pollutants. Pumping of industrial waste water into ground water has resulted in high nitrate, arsenic and iron content.[2] Many pollutants may also be found in solution form in water. These may be phosphates, fluorides, nitrates and certain metals or may be unnatural materials such as pesticides[3]. Many causes of pollution including sewage and fertilizers, contain nutrients such as nitrates and phosphates. In excess levels, nutrients over stimulate the growth of aquatic plants and algae. Excessive growth of these types of organisms consequently clogs our water ways, use up dissolved oxygen as they decompose, and block light to deeper waters. This in turn proves very harmful to aquatic organisms as it affects the respiration ability of fish and other invertebrates that reside in water.



International E-Conference on Materials Processing & Characterization-2020

Recent Advances in the Fabrication of ZnO Based Nanostructures for Opto-Electronic Devices

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Abstract

In recent years, there has been increasing interest in ZnO nanostructures due to their variety of shapes and availability of simple and cost effective processing. While there are still unanswered questions concerning fundamental properties of this material, in particular those related to defects and visible luminescence lines, great progress has been made in synthesis methods and device applications of ZnO nanostructures. In this review, we will provide a brief overview of synthesis methods of ZnO nanostructures, with particular focus on the growth of oriented arrays of nanorods/nanoarrays which are of interest for optoelectronic device applications.

Keywords: ZnO, Nanostructures, Fabrication, Opto-electronics, DSSC

1. Introduction

Semiconducting oxide nanostructures such as ZnO, TiO_2, SnO_2, CuO_2 and so on are the focus of current research efforts in nanotechnology due to their special shapes, compositions, chemical, and physical properties. They have now been widely used in the fabrication of energy saving and harvesting devices such as solar cells [1, 2], Lithium ion batteries, fuel cells, transistors, Light emitting devices (LEDs), hydrogen production by water photolysis and its storage, water and air purification by degradation and adsorption of organic pollutants and toxic gases, environmental monitoring by their applications in the fabrication of gas, humidity and temperature sensors, UV screening, and photodetectors [1-3]. Instead of

Synthesis and thermal expansion of Yttrium doped Ceria based nanomaterials for SOFC

Prashanth Kumar Vaidya[1,*], Y.S.Reddy[2], and C.Vishnuvardhan Reddy[3]

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[2]Department of Physics, Chaitanya Bharathi Institute of Technology, Hyderabad, Telangana, India
[3]Department of Physics, Osmania University, Hyderabad, Telangana, India
***Email:** pv.pss@kitsw.ac.in

Abstract
A kind of electrolyte materials for intermediate temperature solid oxide fuel cells (IT-SOFCs) were prepared by sol-gel method. Thermal expansion of the yttrium based electrolytes was studied by dilatometry. Thermal expansion measurements on the sintered samples were carried out from room temperature (RT) to 1000^0C. The average linear thermal expansion coefficient range was found to increase with increasing Y. The thermal expansion curves for all values of x displayed rapid increase in slope at high temperatures.
Keywords: Solid Oxide Fuel Cells, Sol-gel, Electrolytes, Thermal Expansion

1. Introduction
The solid oxide fuel cell (SOFC) is an electrochemical device that can be used for either stationary or mobile generation of electrical energy as a clean, reliable and flexible power production [1]. SOFC is regarded as a highly efficient power-generation system with future application. A typical high-temperature SOFC uses 8 mol% Yttria-Stabilized Zirconia (YSZ) as the electrolyte, which is usually operated at temperatures as high as 800^0C–1000^0C.

Effect of Poly Ethylene Glycols for the Conversion of Organic Acids to β –Nitrostyrenes underConventional and Non-Conventional Conditions

International E-Conference on Materials Processing & Characterization-2020

Effect of Poly ethylene glycols for the Conversion of Organic acids to β – nitrostyrenes under conventional and Non-conventional Conditions.

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2 Department of Chemistry, Osmania University, Hyderabad -500001, Telangana (India)
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Abstract

Poly ethylene glycols (PEG-200, 300, 400, 600, 4000 and 6000) supported reactions were conducted with certain α, β-unsaturated acids in presence of metal nitrates under solvent free (solid state) and mineral acid free conditions. The reactants were ground in a mortar with a pestle for about 30 minutes. The aromatic acids underwent nitro decarboxylation and afforded β-nitro styrene derivatives in very good yield while α, β-unsaturated aliphatic carboxylic acids gave corresponding nitro derivatives. Addition of PEG accelerated rate of the reaction enormously. Reaction times substantially decreased from several hours to few minutes followed by highly significant increase in the product yield. Among the several PEGs, PEG-400 has been found to be much more effective than other PEGs.

Keywords: Poly ethylene glycols (PEG); rate accelerations; α, β-unsaturated acids; metal nitrates; solvent free (solid state); β-nitro styrene derivatives; α, β-unsaturated aliphatic

Structurally connected Vanadates and Molybdates as Electrode materials

Saritha D.

Structurally connected Vanadates and Molybdates as Electrode materials

Electrode materials for Li ion batteries

LAP LAMBERT Academic Publishing

This book presents the Electrochemical performance of three structurally related compounds MVMoO7 (M= Fe3+, Cr3+, Al3+) as electrode materials for Li-ion batteries. It is observed that the voltage corresponding to the redox couples V5+/V4+ and Mo6+/Mo5+ are significantly different for AlVMoO7 vis-à-vis the Fe and Cr analogues. This study provides conclusive evidence that the presence of different counter cations in the lattice (trivalent ions in the present case) does affect the energetics of the redox process of the electrochemically active species. FeVMoO7, CrVMoO7 and AlVMoO7 react with 3.5 Li, 2.5 Li and 3.3 Li per formula unit, respectively of which reversible extraction of 2.2 Li, 1.3 Li and 2.6 Li respectively, is possible. The results of cycling studies show that FeVMoO7 and AlVMoO7 phases exhibit a reversible capacity of 160 mAhg-1 and 180 mAhg-1 without any noticeable capacity fading even after 20 cycles. Reversibility of reaction of Li is more facile in AlVMoO7 vis-à-vis the other phases.

I have completed my MSC in Chemistry in 2006 from Andhra University Vizag. I have done my Ph.D. in Material science on SYNTHESIS, CHARACTERIZATION AND STUDIES ON ELECTROCHEMICAL LI INSERTION IN SELECT TRANSITION METAL COMPOUNDS WITH CHANNEL STRUCTURES from Indian Institute of Technology, Madras (IITM). Working as Assistant Professor at CBIT, HYD.

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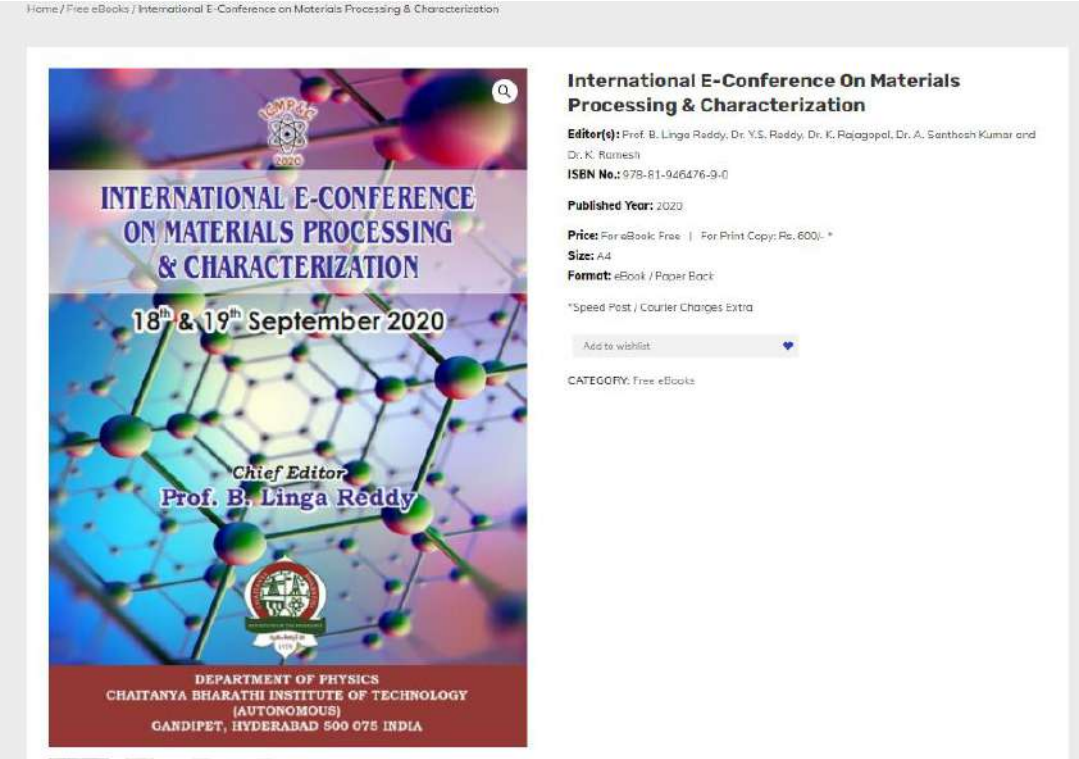
Insertion Type electrodes for Li-ion Batteries



Insertion-Type Electrodes for Li-Ion Batteries

D.Saritha
Department of Chemistry, Chaitanya Bharathi Institute of Technology (A), Hyderabad, Telangana, 500075, India
Corresponding author's email: dsaritha_chm@cbit.ac.in

Abstract

Li-ion battery research enormously spotlight on progression in the fabrication, optimization, and categorization of electrode resources. They became popular as energy storage resources particularly owing to energy and power densities, life span, price and protection. The brisk expansion of electronic devices and electric vehicles stress a great energy density. Consequently, metals, alloys and transition-metal oxides have been employed as anodes for Li-ion batteries. Transition-metal oxide anodes further organized into alloying-category, conversion-category insertion-category materials. The extensive enlightenment on contemporary comprehension of insertion-type resources as anodes for Li- ion batteries will be offered in this paper with few instances.

Keywords: Insertion, electrode, Li-ion battery, anodes

1. Introduction

The research society is currently paying interest on well-organized energy storage approaches intended for the progress of optional energy for the substitution of fossil fuels [1]. Electric vehicles replaced by gasoline driven transport vehicles reduces the release of greenhouse gases. Li-ion batteries take part in a major task owing to their superior energy, power density, extensive cycle existence and small self-discharge [1]. These batteries are employed in several versatile devices as cellular phones, laptops and digital electronics [2]. The enhancement of Li-ion battery energy density can be accomplished by advancing either superior capacity anode and cathode electrode resources. The novel anode materials can be categorized into three chief types supported on their reaction procedure 1) Insertion/de-insertion materials with few instances carboneous materials $Li_4Ti_5O_{12}$ TiO_2 etc; 2)

Chapter Name: 2D Layered Structure of Bismuth Oxyhalides for Advanced Applications. Title: Adapting 2D Nanomaterials for Advanced Applications

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2D Layered Structure of Bismuth Oxyhalides for Advanced Applications

Muvva D. Prasad, Gubbala V. Ramesh, and Sudip K. Batabyal*

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Adapting 2D Nanomaterials for Advanced Applications
Chapter 12, pp 295-315

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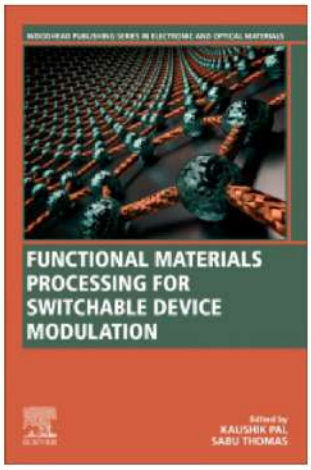
SUBJECTS: Chemical structure, Electrical conductivity, Layers, Sensors, Two dimensional materials

Abstract

Development of two-dimensional (2D) layered nanomaterials of bismuth oxyhalides (BiOCl, BiOBr, and BiOI) has attracted considerable interest due to the renewable energy conversion. A new class of 2D layer semiconductor materials and tunable morphologies enhance the photocatalytic reactions. The dominant {001} facet engineering structures and bandgap controlling can be achieved by changing the stoichiometry ratios of the precursor solution. Synthesis of polymer composite thin films and fabrication methods involve free-standing flexible films, which are used as a dip photocatalyst for degradation of pollutants. 2D nanomaterials and surface-interaction engineering modification with noble metal nanoparticles establish hybrid nanostructures. The hybrid nanostructures enhanced the light absorption property through the plasmonic effect-induced "hot electrons" that improve the conductivity of the materials and are used in photodetector and surface-enhanced Raman scattering applications. The bandgap of the 2D layer nanomaterial was controlled by modulating the thickness and concentration of the precursor element. 2D layer structures of bismuth oxyhalides are a promising avenue for featured diverse technologies and wide applications in electronics, optoelectronics, photodetectors, and photovoltaics.

Book Title: Functional Materials Processing for Switchable Device Modulation. Chapter Title: Recent advances in functional materials: Bioelectronics-integrated biosensor applications Elsevier Ltd, Chapter 12, pp 221-239, 2021



Functional Materials Processing for Switchable Device Modulation

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Recent advances in functional materials: Bioelectronics-integrated biosensor applications

12

Gubbala V. Ramesh[a,*], Ch. G. Chandaluri[b,*], Kiran Kumar Tadi[c], Naveen K. Dandu[d], and N. Mahender Reddy[a]

[a]Department of Chemistry, Chaitanya Bharathi Institute of Technology (A), Hyderabad, Telangana, India, [b]Faculty of Chemistry, Humanities and Sciences Division, Indian Institute of Petroleum and Energy, Visakhapatnam, Andhra Pradesh, India, [c]Centre for Healthcare Advancement, Innovation and Research, Vellore Institute of Technology, Chennai, Tamilnadu, India, [d]Material Science Division, Argonne National Lab, Argonne, IL, United States

12.1 Introduction

Bioelectronics has emerged due to expeditious advances in the fields of nanotechnology, biotechnology, information, and communication technology (ICT) [1]. The term bioelectronics was first proposed in 1968. Back then, the term was defined as the intermolecular electron transfer found in biological systems, although its current meaning is somewhat different [2]. In 2005, Tony Turner defined it as "a recently coined term for a field of research that works to establish a synergy between electronics and biology" [3]. Bioelectronics integrates biomolecules and electronic elements in the development of functional devices; it has been a major research initiative for future practical applications. Ever-expanding technologies allowed small biomolecules, such as proteins and nucleic acids, to use intrinsic electronic features to design and fabricate complex bioelectronics. Understanding the principles of charge transfer inside organic material is exceedingly beneficial in the development of sustainable instruments such as electrocardiograms, cardiac pacemakers, and blood pressure and flow monitoring. Bioelectronic technologies have benefits in terms of miniaturization, new features, or implantability, and will replace future devices based on silicon.

A biosensor is a unique type of bioelectronic device used for bioanalysis; it usually contains physiochemical transducers and biological sensing materials (bioreceptors). The basic function of a sensor is to convert the input variable into a suitable measurement signal. In the past decade, the materials and resources needed to create biosensing devices have been developed. These have improved the sensitivity, selectivity, and multiplexing capacities of today's biosensors through significant technological

* Equally contributed.

Functional Materials Processing for Switchable Device Modulation. https://doi.org/10.1016/B978-0-12-823972-0.00002-2

Rayleigh-Bénard Convection in the Presence of Synchronous and Asynchronous Thermal Rigid Boundary Conditions.

Proceedings of Fourth International Conference on Inventive Material Science Applications pp 323–336

Rayleigh-Bénard Convection in the Presence of Synchronous and Asynchronous Thermal Rigid Boundary Conditions

Palle Kiran

Conference paper | First Online: 20 October 2021

365 Accesses

Part of the Advances in Sustainability Science and Technology book series (ASST)

Abstract

This paper investigates the effect of time-periodic temperature modulation on Rayleigh-Benard convection using rigid isothermal boundary conditions. The time-periodic temperature modulation has been considering in three different modes, out-of-phase (OPM), lower boundary (LBMO), and in-phase modulation (IPM). Heat transfer results are calculated in terms of the Nusselt and mean Nussult numbers through the finite amplitude of convection which is derived from the Ginzburg-

Kiran, P. (2022). Rayleigh-Bénard Convection in the Presence of Synchronous and Asynchronous Thermal Rigid Boundary Conditions. In: Bindhu, V., R. S. Tavares, J.M., Ţălu, Ş. (eds) Proceedings of Fourth International Conference on Inventive Material Science Applications. Advances in Sustainability Science and Technology. Springer, Singapore. https://doi.org/10.1007/978-981-16-4321-7_28

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Nonlinear thermal instability of couple-stress fluids in porous media under thermal modulation.

Proceedings of Fourth International Conference on Inventive Material Science Applications pp 361–372

Nonlinear Thermal Instability of Couple-Stress Fluids in Porous Media Under Thermal Modulation

S. H. Manjula & Palle Kiran

Conference paper | First Online: 20 October 2021

Part of the Advances in Sustainability Science and Technology book series (ASST)

Abstract

Temperature modulation effect on chaotic convection in a porous media saturated with couple stress fluid has been investigated. Three different profiles of thermal modulations, OPM (out of phase modulation), LBMO (lower boundary modulation), IPM (in phase modulation) have been investigated. The Darcy-Brinkman model has been employed for the porous media. The transition from stable mode to the unstable mode in terms of chaos analyzed with modulation and couple stress parameter. Lorenz system of equations Lorenz (Deterministic non-

Copyright information

About this paper

Cite this paper

Manjula, S.H., Kiran, P. (2022). Nonlinear Thermal Instability of Couple-Stress Fluids in Porous Media Under Thermal Modulation. In: Bindhu, V., R. S. Tavares, J.M., Ţălu, Ş. (eds) Proceedings of Fourth International Conference on Inventive Material Science Applications. Advances in Sustainability Science and Technology. Springer, Singapore. https://doi.org/10.1007/978-981-16-4321-7_31

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The time periodic solutal effect on oscillatory convection in an electrically conducting lluid layer

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Published Online: 05 October 2020

Palle Kiran, S. H. Manjula, P. Suresh, and P. Raj Reddy

The Time Periodic Solutal Effect On Oscillatory Convection In An Electrically Conducting Lluid Layer

Palle Kiran[1, a)], SH. Manjula[2, b)], P. Suresh[3, c)], P. Raj Reddy[4, d)]

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Abstract. The present article is to study mass transfer in an electrically conducting Newtonian fluid layer subject to imposed time-periodic solutal modulation. The mass transfer coefficient is calculated by complex Ginzburg Landau (CGLE) amplitude equation. It is a cubic equation involving oscillatory finite amplitude and obtained using solvability condition. A weakly nonlinear analysis is applied to investigate mass transfer in the layer. The oscillatory convection is discussed in the presence of oscillatory solutal Rayleigh number. The amplitude equation (CGLE) is solved numerically to evaluate mass transfer in terms of the various system parameters. The effect of individual parameter on mass transport is discussed in detail. Further the mass transfer is more for oscillatory mode than the stationary mode. Finally it is also found that, solutal modulation can be effectively applied in either enhancing or diminishing the mass transfer.

Keywords: Weakly nonlinear theory, Oscillatory magneto-convection, Complex Ginzburg−Landau model, Solutal modulation.

INTRODUCTION

Thermal convection is the flow of fluid induced by a temperature difference, or gradient. Rayleigh-Benard convection (RBC) is a particular type of thermal convection problem heating a bottom and cooling top of a horizontal fluid layer creates a vertical temperature gradient. And by the laws of thermal expansion, the fluid on the bottom is less dense than that on the top, and creates an unstable situation. The effect of gravity imposes a downward force on the fluid, while the heat transfer imposes an upward force. A variation on this problem was originally studied by Lord Rayleigh in the early (1900), with an attempted explanation of the problem published in a 1916 article.

Study of Rayleigh B´enard convection (RBC) gained lot of attention due to its prominent applications in thermal and engineering sciences. Instability in a fluid layer is to understand the nature of convective flow under some physical constraints. Numerous applications can be drawn related to convective flows where saving energy is a key point. Study of magnetoconvection in a fluid layer is motivated by Thomson (1951), and Chandrasekhar (1961) and numerous applications such as: astrophysical, geophysical, and in particular sunspots. Convection in the earth metallic core and stellar interiors often occurs in the presence of strong magnetic fields. Nakagawa (1957,1959) studied megneto-convection experimentally and reported that at high strength of magnetic field determines the effect of Chandrasekhar number Q on critical
Rayleigh number to stabilize RBC.

Rudraiah (1984), the effect of externally imposed vertical magnetic field on double diffusive convection is investigated. Both linear and nonlinear theories are examined and the stability criterion as well as heat and mass transport presented. It is observed that magnetic field enhances stability criteria and diminished the heat mass transfer. It is pointed that magnetic field can be used to control stability criteria as well as reduce heat mass transfer. Another interesting concept to regulate stability criteria or heat mass transfer is modulation. This modulation concept is either gravity, thermal, rotational, magnetic and solutal etc. The gravity modulation is given by Gresho and Sani (1970), thermal modulation by Venezian, (1969), rotational modulation by Bhadauria and Kiran, (2014) and magnetic modulation by

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Work Life Balance during the COVID-19 Pandemic-An Empirical Study

Young Citizen's Political Engagement in India: Social Media Use by Political Parties

Mandakini Paruthi (School of Management Studies, Chaitanya Bharathi Institute of Technology, India), Priyam Mendiratta (School of Business Studies, Sharda University, India) and Gaurav Gupta (School of Business Studies, Sharda University, India)

Source Title: Examining the Roles of IT and Social Media in Democratic Development and Social Change (/book/examining-roles-social-media-democratic/234359)

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DOI: 10.4018/978-1-7998-1791-8.ch005

Abstract

Social media has emerged as a dominant digital medium platform in contemporary society. The quick development of social media has instigated changes concerning the way publics to interact with a group of people with similar ideologies, the quality of information they share, or the opportunity to acquire and share ideas. Social media use has a major influence on public relations, marketing, and political communication. Therefore, politicians are formulating their strategies to reach increasingly networked individuals. The chapter defines political engagement concept, focuses on excessive use of social media to understand how the emergence of digital citizenship is changing political engagement. In addition to this, the chapter also examines whether the use of social media exercise any effect on 2014 and 2019. General elections outcome or not and discuss the proposed conceptual framework for future empirical testing. The chapter highlights the various concerns needed to be taken care of while using social media as a marketing tool for promoting political participation and engagement.

Chapter Preview

Top

Introduction

Social media has emerged as a dominant digital platform in the present-day digital society (Kumar & Nanda, 2019b). It has become an essential part of community discussions and communication. The quick development of social media has instigated changes concerning the way publics interact with group of people with similar ideologies, the quality of information they share or the opportunity to acquire and share ideas. Social media platforms are increasingly being accessed and used at all times and places, resulting in major impact on public relations, marketing, and political communication. Therefore, politicians are also utilizing the social media in formulating their strategies to reach increasingly networked individuals (Pradhan & Kumar, 2015). They are giving more preference to social media attention of the public in driving political engagement.

Viability of an Uncomplicated IoT SaaS Development for Deployment of DIY Applications Over HTTP with Zero Investment, Advances in Decision Sciences

Viability of an Uncomplicated IoT SaaS Development for Deployment of DIY Applications Over HTTP with Zero Investment

Sujanavan Tiruvayipati & Ramadevi Yellasiri

Conference paper | First Online: 13 July 2019

Part of the Learning and Analytics in Intelligent Systems book series (LAIS,volume 3)

Abstract

IoT administrations are ordinarily conveyed of IoT as physically disconnected vertical arrangements, in which all framework segments running from tangible gadgets to applications are firmly coupled for the prerequisites of each explicit venture. The productivity and versatility of such administration conveyance are naturally constrained, presenting noteworthy difficulties to IoT arrangement developers. In this context, we propose a novel SaaS structure that gives basic stage administrations to IoT arrangement suppliers to productively convey and constantly expand their administrations for DIY applications over HTTP with no investment required. This paper initially presents the IoT SaaS engineering, on which IoT arrangements can be conveyed as virtual verticals by utilizing figuring assets and middleware benefits on free cloud services. At that point we present the itemized instrument, usage of area intervention, which helps arrangement suppliers to productively give area explicit control applications by designing their own SaaS for IoT. The proposed methodologies are exhibited through the implementation of a sample experiment for building the need. A prototype proposed method is discussed in this paper.

Cite this paper

Tiruvayipati, S., Yellasiri, R. (2020). Viability of an Uncomplicated IoT SaaS Development for Deployment of DIY Applications Over HTTP with Zero Investment. In: Satapathy, S.C., Raju, K.S., Shyamala, K., Krishna, D.R., Favorskaya, M.N. (eds) Advances in Decision Sciences, Image Processing, Security and Computer Vision. Learning and Analytics in Intelligent Systems, vol 3. Springer, Cham. https://doi.org/10.1007/978-3-030-24322-7_27

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A Survey on Emotion's Recognition Using Internet of Things

A Survey on Emotion's Recognition Using Internet of Things

K. P. L. Sai Supriya ✉, R. Ravinder Reddy & Y. Rama Devi

Conference paper | First Online: 05 November 2018

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 815)

Abstract

Emotions play an important role in human life, because the emotions allow other people to understand the feelings. Emotions are obtained due to some physiological changes in human. When a person is in a situation where he is unable to speak, then their emotions can be used to understand the feelings. By using Internet of things, the emotions are going to be detected. In the first step, the sensors are placed on the human body. These sensors will capture the data, and real-time monitoring can be done. The data which is collected from the sensors is used for the emotion detection. Here the different works on IoT which is used for human

Cite this paper

Sai Supriya, K.P.L., Ravinder Reddy, R., Rama Devi, Y. (2019). A Survey on Emotion's Recognition Using Internet of Things. In: Bapi, R., Rao, K., Prasad, M. (eds) First International Conference on Artificial Intelligence and Cognitive Computing . Advances in Intelligent Systems and Computing, vol 815. Springer, Singapore. https://doi.org/10.1007/978-981-13-1580-0_31

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Voiceprint-Based Biometric Template Identifications

Chapter

Voiceprint-Based Biometric Template Identifications

By Akella Amarendra Babu, Sridevi Tumula, Yellasiri Ramadevi

Book The Biometric Computing

Edition	1st Edition
First Published	2019
Imprint	Chapman and Hall/CRC
Pages	18
eBook ISBN	9781351013437

ABSTRACT

Performance improvement of the speaker recognizers using the traditional methods like signal processing, has hit a dead end. Speech researchers are therefore now focusing on other techniques and processes to supplement the traditional methods to reduce the gap in communication interfaces between humans and machines. Voiceprint based biometric identifications is evolving as a new technique. Phonetic distance measurement is one such evolving technique and the cutting edge researchers are inspired to work on this technique to circumvent and overcome the above problem. This chapter covers a new speaker recognition model based on the pronunciation variability. The pronunciation variability is used to identify the voiceprint of the speakers. The Kullback-Leibler divergence relative entropy criterion is used for the speaker identification and verification. An adaptation model is designed for the unsupervised dynamic adaptation of the new pronunciation variants. The multi-layered code book memory using the modified vector quantization technique is designed to keep the word confusability low and ensures efficient retrieval of the pronunciation variants. The confusion matrix and performance metrics are used for performance evaluation of pronunciation classifier. The pronunciation classification error rate, OOV error rate and word error rate are used for evaluation.

A Proficient and Smart Electricity Billing Management System

A Proficient and Smart Electricity Billing Management System

P. Pramod Kumar ✉ & K. Sagar

Conference paper | First Online: 13 July 2019

Part of the Learning and Analytics in Intelligent Systems book series (LAIS,volume 3)

Abstract

Electricity is an energy that play a major role in human life. In day to day life, each and every device from machinery to wrist watch everything works on electricity. It is the most basic requirement next to food, shelter, and clothing. From the past decade's lot of changes took place in electricity departments but even now they are using manual billing system. This system has a wide range of disadvantages like malpractices are done while billing, escaping from punishment if any late payments, manpower for billing and collecting bills and wastage of paper billing. And moreover, if a fire accident or a technical problem arises the whole lane (transformer) will be terminated from power supply this may cause an inconvenience to the peer consumers too. Here, we are concerned about the economic loss that arises due to the manual billing system. In the manual billing system, every month end or for a couple of months bill is generated. An employee from the electricity department comes to each and every house for billing the meters based on the number of units the consumer has consumed.

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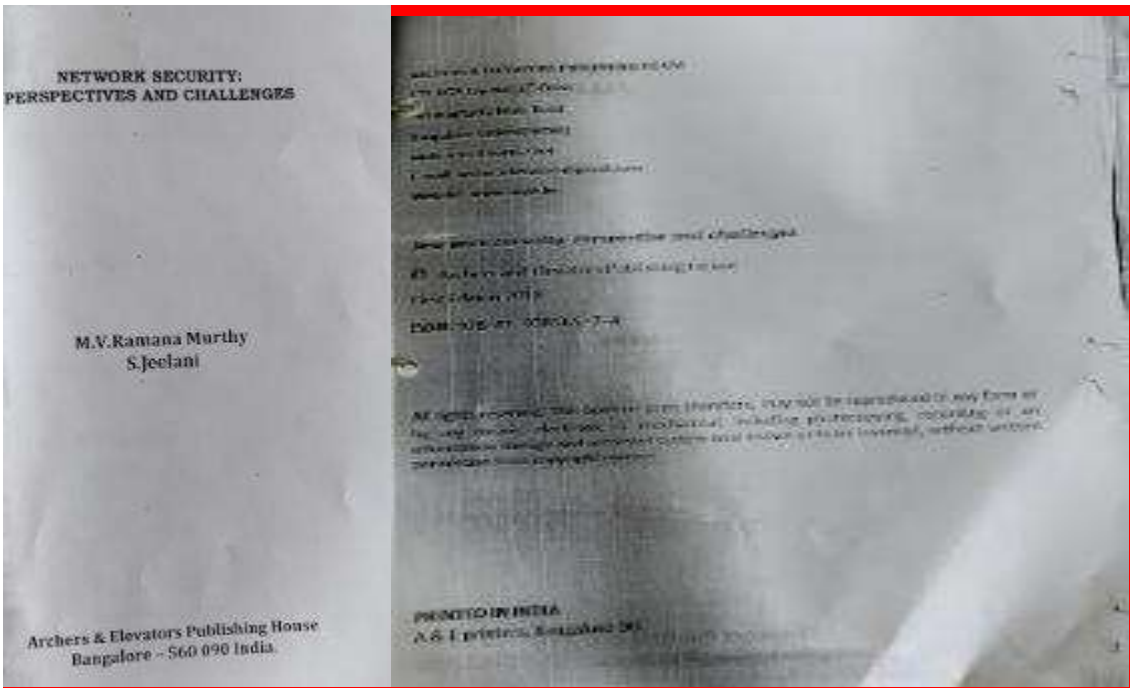
Network Security: Perspectives and Challenges



Detection of Natural Features and Objects in Satellite Images by Semantic Segmentation Using Neural Networks

Detection of Natural Features and Objects in Satellite Images by Semantic Segmentation Using Neural Networks

Vihar Kurama, Samhita Alla & Sridevi Tumula

Chapter | First Online: 14 November 2019

Part of the Remote Sensing and Digital Image Processing book series (RDIP,volume 24)

Abstract

In recent years, Neural Networks have become one of the most research focused areas of Artificial Intelligence. From detecting objects in real time to the classification of images, these Neural Networks are efficient and are achieving maximum possible accuracies based on the given inputs. In this work, we use Neural Networks for detecting features in satellite images. Using image segmentation and object detection techniques, we find objects, like roads, buildings, trees, and other resources, in the satellite images. In this work, Neural Network architecture used for segmentation of the images is ConvNet also called Convolutional Neural Network. U-Net which has a convolutional autoencoder architecture maps the layers to find the features and resources in the given satellite images. U-Nets do per-pixel semantic alignment for finding objects and features which result in segregation of resources. By using

Cite this chapter

Kurama, V., Alla, S., Tumula, S. (2020). Detection of Natural Features and Objects in Satellite Images by Semantic Segmentation Using Neural Networks. In: Hemanth, D. (eds) Artificial Intelligence Techniques for Satellite Image Analysis. Remote Sensing and Digital Image Processing, vol 24. Springer, Cham. https://doi.org/10.1007/978-3-030-24178-0_8

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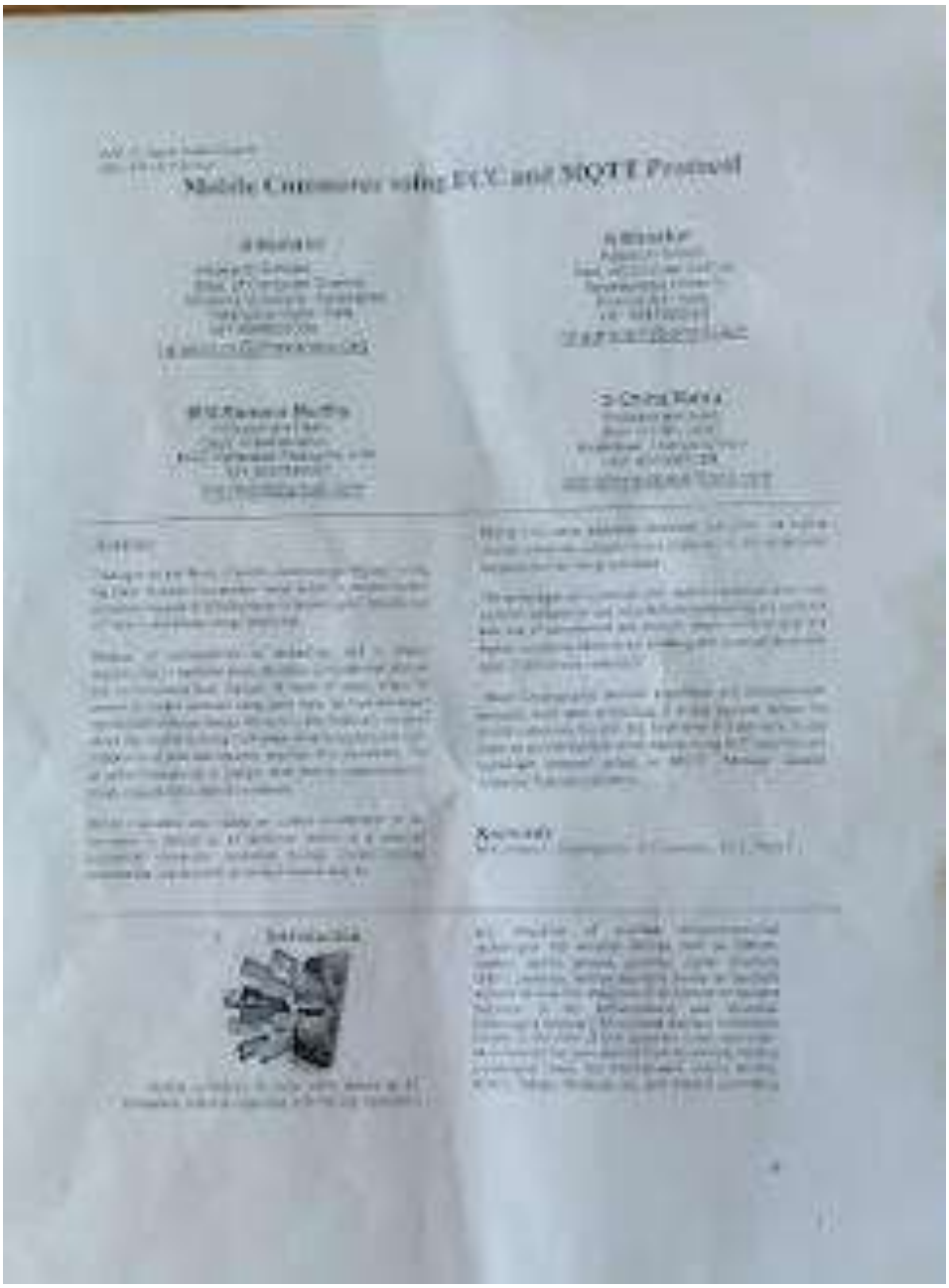
Mobile Commerce using ECC and MQTT Protocol



Detecting fraud in cyber banking using feature selection and genetic algorithm

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DETECTING FRAUD IN CYBER BANKING USING FEATURE SELECTION AND GENETIC ALGORITHM

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

***IndexTerms* - cyber banking, feature selection, genetic algorithm, fraud detection.**

I. Introduction

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

1. Bank fraud : It can be defined as "whoever knowingly executes to defraud a financial institution; or to obtain any of the money, funds, credits, assets, securities, or other property owned by a financial institution, by means of fraudulent pretends," that is, mortgage fraud, money laundering, etc.
2. Insurance fraud : It is the one which occurs in between the insurance process. It can happen while in application, billing, rating, claims, eligibility process etc. and are dedicated mostly by healthcare providers, consumers, agents or brokers, company employees and others.
3. Security and commodities fraud : It includes theft from manipulation of the market, securities accounts and wire fraud. It widely includes market manipulation, high yield investment fraud, commodities fraud, foreign exchange fraud, late-day trading, broker embezzlement, etc.
4. Other related financial fraud : It includes frauds such as mass marketing fraud and corporate fraud.

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

1. Anomaly detection: In this method, the history of customer behaviour is considered a normal behaviour and any deviation from this behaviour can be recovered as an anomaly or fraud.
2. Misuse detection: This method focuses on specific behaviours of customer and assumes some unknown behaviours as a fraud. The main objective is to propose a new technique to detect fraud in e-banking using a new combination of algorithms to serve the purpose.

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

Applications of IoT for Soil Quality. In: Gunjan

Applications of IoT for Soil Quality

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Abstract. The farming industry has become more important than ever before in the next few decades. Farmers and agricultural companies are turning to the Internet of Things (IoT) to meet demand. Since we need to continuously take measures manually it requires large amount of time. So using this Smart Agriculture we can effectively take the measurements in less amount of time. In this Smart Agriculture sensors can provide continuous measurements with respect to climate changes. Using Internet of things we can produce different ways to cultivate soil. Smart Agriculture and Smart Farming applications will help the farmer with 24/7 visibility into soil, crop health, and energy consumption level. This paper presents how to analyze soil moisture levels, soil type and soil quality according to the water and climate change. By considering all this factors, farmers can decide which type of crop is suitable for the particular soil to get profit instead of using traditional lengthy methods, and how much fertilizers have to use according to nutrients level in soil.

Keywords: IoT · NodeMCU · Smart agriculture

1 Introduction

Our country produce crop production with the foremost food staples. The farming industry is going to become very important in upcoming years. According to the UN Food and Agriculture Organization the world has to produce 70% more food in 2050 than 2006 [14]. In India agriculture system the continuous assessment for soil quality, type, evapotranspiration, and moisture levels are not done. Farmers need to take help of the soil department to know about features of soil [17, 18]. IoT is one of the technology which can provide a solution for this problem, which aims to extend system with more features. This paper presents to monitor soil moistures and consider different sensors to collect the data. Sensors are to be connected to the device through WiFi module and data which is retrieved from the sensor can be stored in the server or cloud. Later on the sensor data, data analysis has to be performed. From this analysis farmer can decide which crop can be choose according to the soil and climate change.

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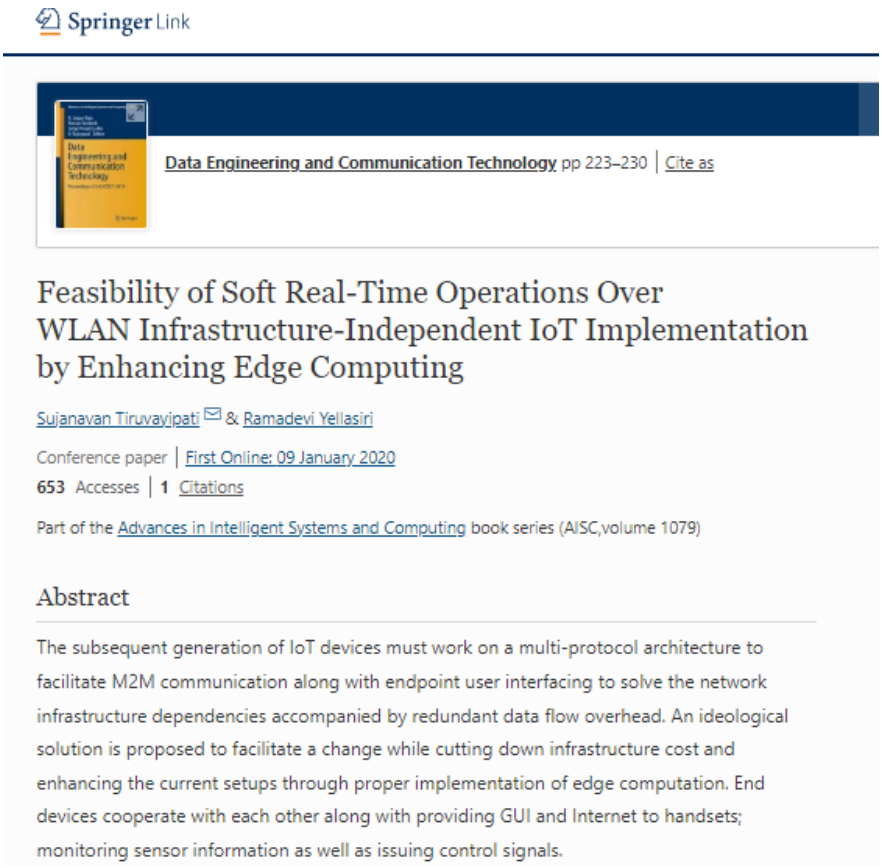
1. **Feasibility of Soft Real-Time Operations Over WLAN Infrastructure-Independent IoT Implementation by Enhancing Edge Computing**



Springer Link

Data Engineering and Communication Technology pp 223–230 | Cite as

Feasibility of Soft Real-Time Operations Over WLAN Infrastructure-Independent IoT Implementation by Enhancing Edge Computing

Sujanavan Tiruvayipati & Ramadevi Yellasiri

Conference paper | First Online: 09 January 2020

653 Accesses | 1 Citations

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 1079)

Abstract

The subsequent generation of IoT devices must work on a multi-protocol architecture to facilitate M2M communication along with endpoint user interfacing to solve the network infrastructure dependencies accompanied by redundant data flow overhead. An ideological solution is proposed to facilitate a change while cutting down infrastructure cost and enhancing the current setups through proper implementation of edge computation. End devices cooperate with each other along with providing GUI and Internet to handsets; monitoring sensor information as well as issuing control signals.

Cite this paper

Tiruvayipati, S., Yellasiri, R. (2020). Feasibility of Soft Real-Time Operations Over WLAN Infrastructure-Independent IoT Implementation by Enhancing Edge Computing. In: Raju, K., Senkerik, R., Lanka, S., Rajagopal, V. (eds) Data Engineering and Communication Technology. Advances in Intelligent Systems and Computing, vol 1079. Springer, Singapore. https://doi.org/10.1007/978-981-15-1097-7_19

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Advances in Decision Sciences, Image Processing, Security and Computer Vision pp 206–213

Viability of an Uncomplicated IoT SaaS Development for Deployment of DIY Applications Over HTTP with Zero Investment

Sujanavan Tiruvayipati ✉ & Ramadevi Yellasiri

Conference paper | First Online: 13 July 2019

580 Accesses

Part of the Learning and Analytics in Intelligent Systems book series (LAIS,volume 3)

Abstract

IoT administrations are ordinarily conveyed of IoT as physically disconnected vertical arrangements, in which all framework segments running from tangible gadgets to applications are firmly coupled for the prerequisites of each explicit venture. The productivity and versatility of such administration conveyance are naturally constrained, presenting noteworthy difficulties to IoT arrangement developers. In this context, we propose a novel SaaS structure that gives basic stage administrations to IoT arrangement suppliers to productively convey and constantly expand their administrations for DIY applications over HTTP with no investment required. This paper initially presents the IoT SaaS engineering, on which IoT arrangements can be conveyed as virtual verticals by utilizing figuring assets and middleware benefits on free cloud services. At that point we present the itemized instrument, usage of area intervention, which helps arrangement suppliers to productively give area explicit control applications by designing their own SaaS for IoT. The proposed methodologies are exhibited through the implementation of a sample experiment for building the need. A prototype proposed method is discussed in this paper.

Cite this paper

Tiruvayipati, S., Yellasiri, R. (2020). Viability of an Uncomplicated IoT SaaS Development for Deployment of DIY Applications Over HTTP with Zero Investment. In: Satapathy, S.C., Raju, K.S., Shyamala, K., Krishna, D.R., Favorskaya, M.N. (eds) Advances in Decision Sciences, Image Processing, Security and Computer Vision. Learning and Analytics in Intelligent Systems, vol 3. Springer, Cham. https://doi.org/10.1007/978-3-030-24322-7_27

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Use of recycled concrete aggregate in self compacting concrete: A need for sustainable development

MF-104: USE OF RECYCLED CONCRETE AGGREGATE IN SELF COMPACTING CONCRETE: A NEED FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

Construction has a major share in developing infrastructure in any Country. Accordingly, in the next five years, infrastructure in India will need a huge expenditure. 'Recycled' concrete aggregate could be a reliable alternative to using natural aggregates in concrete construction which unfortunately is not put to re-use. Dumping of wastes on land is not only causing shortage of space, but also environmental problems in cities. Further, due to urbanization, distance between demolition waste generation area and disposal land area has also become longer and therefore, transportation cost for disposal has increased and thus resulted in the excessive use of energy. Recycling of demolished waste can offer not only the solution of growing waste disposal problem, but will also help to conserve natural resources for meeting increasing demand of aggregates for long time to come for construction industry leading to sustainable development.

This paper describes the outcome of tests carried out about the use of Recycled Concrete Aggregate in Self Compacting Concrete(RASCC). Recycled aggregates used in this study were generated by crushing of construction and demolition waste (CDW). Seven different grades of concrete mixes (M20 to M70) were produced with five recycled aggregate contents (0%, 25% 50%, 75% and 100%). Compressive strength, split tensile strength and flexural strength of the concrete were determined. It was observed that there was no significant variation in compressive strength, split tensile strength and flexural strength of concrete. The findings from the study show that the recycled concrete aggregate may be useful for construction industry as an alternative construction material to natural aggregates.

Keywords: *Recycled concrete aggregate, Construction and Demolition Waste (CDW), Recycled Aggregate Self Compacting Concrete(RASCC). Sustainable Environment.*

Proceeding Abstract Book of National Symposium on Sustainable Waste Management (NSSWM-2019)
20th April, 2019

An Analytical Approach on Effective Selection of Sustainable Materials in Construction Industry by Environmental Management System (EMS) & Green Supply Chain Management

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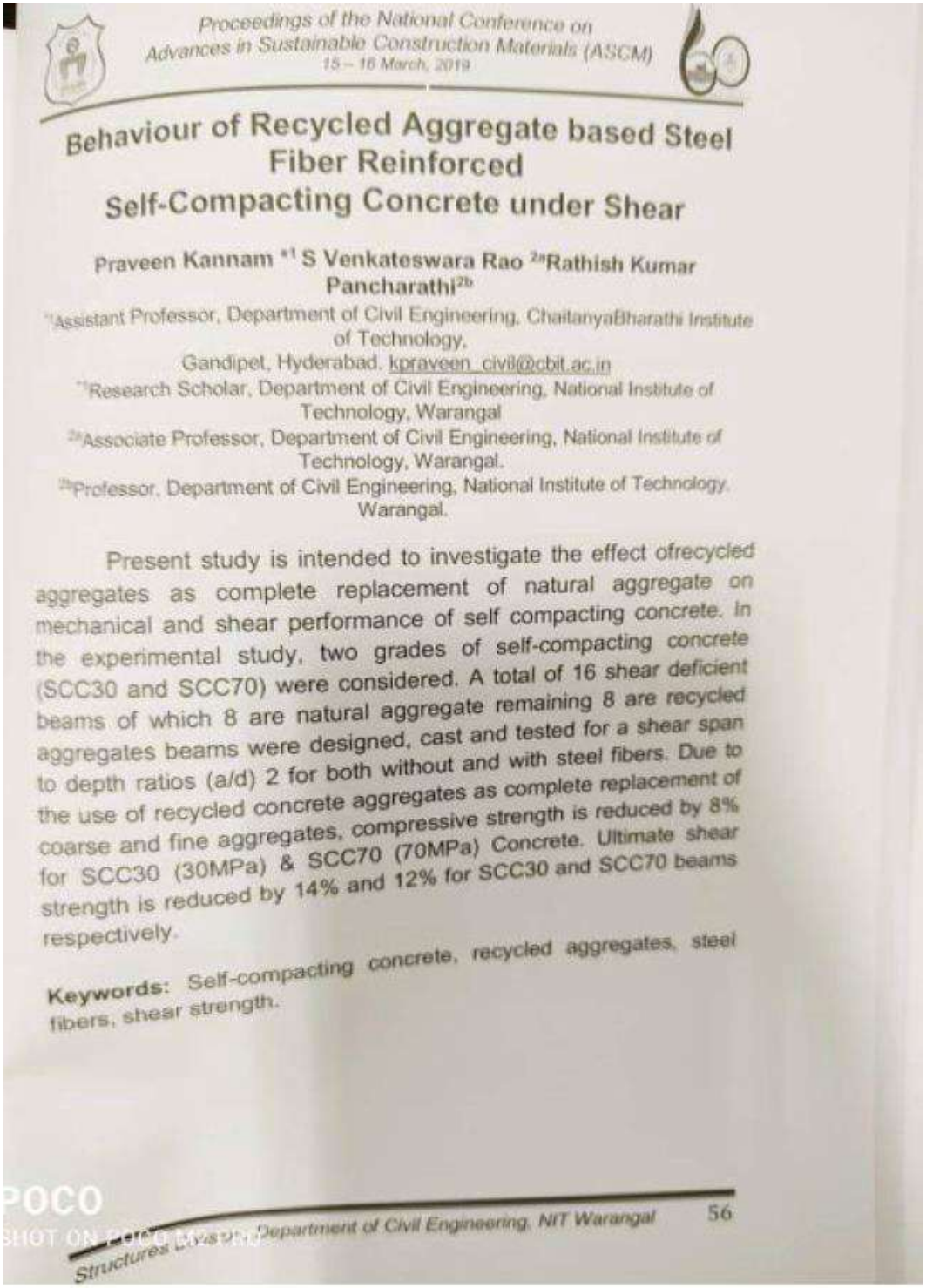
Abstract

For the construction industry the 'sustainability' has become a common word and is also a mandatory concept that is being persisted by the client in the contract itself such has become its importance. The construction industry which has been the predominant contributor for the environmental pollution has been trying to march towards reduction of CO_2 foot prints by making use of sustainable materials.

In this paper, a critical literature review has been conducted about the sustainability and its concepts in a detailed manner. Further review has also been conducted on the possible new sustainable materials which might yield better results in reduction of CO_2 emission and shall sustain though the life span of the project in an effective and efficient manner. Under pinning the fact that selection of these sustainable materials for different construction projects has become a major concern in present construction industry. This paper shall discuss on possible effective methods for identification of suitable sustainable materials for the projects by environmental management system and green supply chain management. From this paper it can be understood that construction industry is slowly marching towards usage of eco-friendly materials and more importantly trying to implement an effective environmental materials selection system such as adoption of green supply chain management thereby which striving towards reduction of CO_2 emission in projects.

Keywords: Environmental management system, Green supply chain, Supply chain management

Behaviour of Recycled Aggregate based Steel Fiber Reinforced Self-Compacting Concrete Under Shear



Proceedings of the National Conference on
Advances in Sustainable Construction Materials (ASCM)
15 – 16 March, 2019

Behaviour of Recycled Aggregate based Steel Fiber Reinforced Self-Compacting Concrete under Shear

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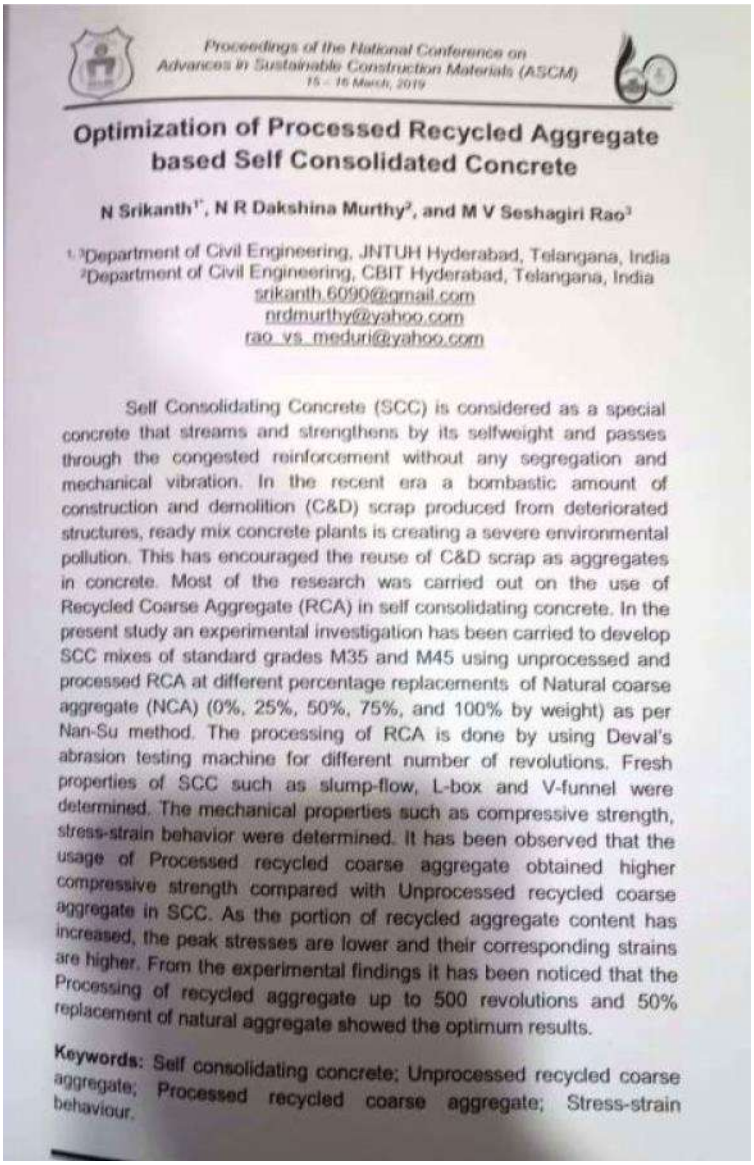
Present study is intended to investigate the effect ofrecycled aggregates as complete replacement of natural aggregate on mechanical and shear performance of self compacting concrete. In the experimental study, two grades of self-compacting concrete (SCC30 and SCC70) were considered. A total of 16 shear deficient beams of which 8 are natural aggregate remaining 8 are recycled aggregates beams were designed, cast and tested for a shear span to depth ratios (a/d) 2 for both without and with steel fibers. Due to the use of recycled concrete aggregates as complete replacement of coarse and fine aggregates, compressive strength is reduced by 8% for SCC30 (30MPa) & SCC70 (70MPa) Concrete. Ultimate shear strength is reduced by 14% and 12% for SCC30 and SCC70 beams respectively.

Keywords: Self-compacting concrete, recycled aggregates, steel fibers, shear strength.

Optimization of Processed Recycled Aggregate based Self Consolidated Concrete



Proceedings of the National Conference on
Advances in Sustainable Construction Materials (ASCM)
15 – 16 March, 2019

Optimization of Processed Recycled Aggregate based Self Consolidated Concrete

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Self Consolidating Concrete (SCC) is considered as a special concrete that streams and strengthens by its selfweight and passes through the congested reinforcement without any segregation and mechanical vibration. In the recent era a bombastic amount of construction and demolition (C&D) scrap produced from deteriorated structures, ready mix concrete plants is creating a severe environmental pollution. This has encouraged the reuse of C&D scrap as aggregates in concrete. Most of the research was carried out on the use of Recycled Coarse Aggregate (RCA) in self consolidating concrete. In the present study an experimental investigation has been carried to develop SCC mixes of standard grades M35 and M45 using unprocessed and processed RCA at different percentage replacements of Natural coarse aggregate (NCA) (0%, 25%, 50%, 75%, and 100% by weight) as per Nan-Su method. The processing of RCA is done by using Deval's abrasion testing machine for different number of revolutions. Fresh properties of SCC such as slump-flow, L-box and V-funnel were determined. The mechanical properties such as compressive strength, stress-strain behavior were determined. It has been observed that the usage of Processed recycled coarse aggregate obtained higher compressive strength compared with Unprocessed recycled coarse aggregate in SCC. As the portion of recycled aggregate content has increased, the peak stresses are lower and their corresponding strains are higher. From the experimental findings it has been noticed that the Processing of recycled aggregate up to 500 revolutions and 50% replacement of natural aggregate showed the optimum results.

Keywords: Self consolidating concrete; Unprocessed recycled coarse aggregate; Processed recycled coarse aggregate; Stress-strain behaviour.

Flexural and Shear behavior of high strength pond ash concrete

National Conference on "Recent Advancements in Civil Engineering" (NCRACE-2K19)

FLEXURAL AND SHEAR BEHAVIOR OF HIGH STRENGTH POND ASH CONCRETE

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Abstract: Concrete is most widely used construction material. Traditionally concrete is made up of cement, river sand as fine aggregate, crushed stone aggregate as coarse aggregate and potable water. Nowadays, river sand is not readily available for use in many places. Instead of natural river sand, crusher sand or manufactured sand obtained from stone aggregate quarries is widely used as fine aggregate in concrete. The main objective of this study was to identify alternative source of good quality fine aggregates which is depleting very fast due to the fast pace of construction activities in India. In the present study the experimental investigations carried out to evaluate the effects of replacing the pond ash with river sand use of super plasticizer, on various concrete properties. Use of pond ash is a waste industrial by-product of power plants provides great opportunity to utilize it as an alternative to normally available aggregates It is found that as the percentage of Pond ash increases from 10% to 15% the strength of the pond ash concrete increases but the results are lower than the target mean strength of the respective M50 and M60 grades of concrete. Hence in the present work 20% replacement of sand by pond ash is considered and the target mean strength values are obtained. The target mean strength of (M50, 66 N/mm² and M60, 69 N/mm²) pond ash replacement was considered to cast the cubes, cylinders and prisms reinforced concrete beams. The Flexural Behaviour of RC beams shows that the ultimate load carrying capacity and shear capacity of concrete. The 28days characteristic compressive strength of M50 and M60 grade Pond ash concrete is 6% and 7.7% higher than the target mean strength of M50 and M60 conventional concrete respectively. The flexural behavior of RC beams with pond ash shows that the failure is brittle when compared to the conventional concrete. The energy absorbed by the conventional beams is more than the pond ash beams. Therefore pond ash is suggestible for construction practices by improving the properties by conducting future studies.

Keywords: High strength concrete, Pond Ash, Fine aggregate, Waste material, Environmental issues, Mechanical properties, Flexural behavior.

1. INTRODUCTION

1.1 GENERAL

Concrete is a commonly used building material in the world. Conventional concrete is a mixture of cement, fine aggregate, coarse aggregate and water. Compare to all other ingredients, aggregates occupy 75 to 80 % of the total volume of concrete and affect the fresh and hardened properties of concrete. In the total composition of concrete, 25 to 30 % was engaged by the fine aggregate in volume. The quality of concrete is persistent by its mechanical properties. The mechanical properties mainly divided into short-term and long-term properties. Compressive strength, Split tensile strength, Modulus of Elasticity and Flexural strength are short term properties. Porosity and impermeability are the long term properties.

1.2 HIGH STRENGTH CONCRETE

American concrete Institute defines a high-strength concrete and high performance concrete as concrete that has a specified compressive strength to design of 6,000 psi (41 MPa) or greater. Under the ACI definition durability is optional and this has led to

Optimal Identification and selection of Phasor Measurement Units- A Methodology

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***Abstract*—The Phasor measurement unit (PMU) is becoming an important tool for monitoring, controlling and protecting the electric networks. Hence its deployment for the present and future power system networks has become a great challenge for the planning engineers. The optimal PMU placement (OPP) is quite important strategy for deploying the PMUs optimally. Since the optimization techniques yield multiple solutions, it has become an important task again for the engineers to select the best set out of all the available solutions of results. This paper, after presenting the literature on various optimization methods used for solving OPP problem, suggests Multiple Criteria Decision Making (MCDM) methods to select the suitable solution based on the criteria.**

Keywords*— *PMU; Observability; OPP; optimization; constraints; MADM; Alternatives; Attributes;

I. Introduction

The invention of Phasor Measuring Unit (PMU) has introduced the backup protection schemes[1], adaptive protection schemes [2-8], model analysis based network redesigning and highly secured power networks [9-10]. Starting from the introduction of optimal PMU placement, many authors have suggested many algorithms to answer the optimal PMU placement. Most of these placements were purely based on observability constraints. And, their results are different from author to author even though their number is different. But, the power utilities are not clear about which set of PMUs should be considered and which set will serve the most of their purpose. To answer this problem, this paper suggests the Multi-Attribute Decision Making methods to be used for selecting the best solution for their desired criteria.

This article is sectionalized as follows: section I introduces PMU and the problem of OPP. Sections II-V List out the mathematical, topological and heuristic algorithms used for solving OPP problem. Section-VI introduces to MCDM techniques and explains TOPSIS method. After discussing the results in section IV, it concludes the work in section V.

A. Phasor Measurement Unit

The Phasor Measurement Unit (PMU) is capable of measuring various synchronized parameters from the power system. To achieve synchronism, it uses synchronizing signals from Global Positioning Satellite (GPS). This has made the PMU the most prominent tool for various power system strategies.

The observability of a bus can be referred as its ability of being measured either directly or indirectly by the PMU placed either to itself or its incidence bus.

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II. Mathematical Algorithms

A. Integer Linear Programming (ILP)

An Integer Linear Programming (ILP) is deterministic strategy in which all the design parameters would take only integer values. An integer linear programming (ILP) based optimal PMU placement for system observability was introduced in [11] where it considers the locations of conventional measurements. The algorithm [12] extends to incorporate conventional measurements to identify the optimal PMU locations. This scheme also gives the PMU locations under any desired level of redundancy. An ILP based multi-stage PMU placement is suggested in [13]. It models zero-injection constraints as linear.

B. Integer Quadratic Programming (IQP)

It deals with the optimization of a quadratic objective function subjected to linear constraints. It assures integer values to all the design variables. In [14], a PMU placement technique was suggested using integer quadratic programming, but, with no including zero-injection effect. It considers both normal as well as the outage of a transmission line or PMU conditions. Paper [15] suggests another IQP approach that uses the network connectivity matrix to determine optimal PMU locations.

III. Topological Algorithms

A. Depth First Search (DFS)

The Depth First Search algorithm is a recursive algorithm used for traversing network. It searches the vertices of network based on the criteria called backtracking. This algorithm continues visiting all the nodes until the unvisited nodes have been visited. Authors have used DFS algorithm to solve the OPP problem. As the DFS criterion is rigid and unitary, the solution may not be optimum. So, it is failed in finding optimum solution even though it is computationally faster.

B. Minimal Spanning Tree (MST)

It is nothing but the modified DFS method. This modification makes the MST algorithm faster, and improves the complexity and convergence.The PMU placement strategies using this approach are implemented.

Analysis of partial discharge due to copper spherical particle in power transformer under different oil flow models using CFD

Intelligent Manufacturing and Energy Sustainability pp 391–400

Investigation of Partial Discharge Due to Copper Spherical Particle in Power Transformer Under Various Oil Flow Models Using CFD

N. Vasantha Gowri

Conference paper | First Online: 15 February 2020

Part of the Smart Innovation, Systems and Technologies book series (SIST,volume 169)

Abstract

Power transformer is an important and costly device in electrical power system. Analysis of power transformer is useful to protect the device from different hazards. Mineral transformer oil acts as a coolant and part insulation in power transformers. Transformer cooling is ensured by non-directed or directed flow of oil inside the transformer. Transformer oil is found to consist of conducting

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Investigation of Partial Discharge Due to Copper Spherical Particle in Power Transformer Under Various Oil Flow Models Using CFD

Author: N. Vasantha Gowri

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Abstract

Power transformer is an important and costly device in electrical power system. Analysis of power transformer is useful to protect the device from different hazards. Mineral transformer oil acts as a coolant and part insulation in power transformers. Transformer cooling is ensured by non-directed or directed flow of oil inside the transformer. Transformer oil is found to consist of conducting particles moving along the flow path of transformer oil. Particles which are conductive in nature when come in contact with the disc, get stress formed on them and may lead to partial discharge (PD). Partial discharge due to particle is one of the grounds of failure of transformers. To find the behaviour of

Optimal Combined Overcurrent and Distance Relays Coordination using Teaching Learning based Optimization

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***Abstract*— Relay coordination is an important aspect to maintain proper power system operation and control. Relays should be organized in such a way that every relay should have a backup and Coordination time interval (CTI) between primary and back up and different zones of the relay should be maintained to achieve proper fault identification and fault clearance sequence. The relays should operate in minimum desirable time satisfying all the co-ordination constraints. So, relay coordination is nothing but highly constraint problem. Heuristic techniques are often used to get optimal solution of this kind of problem. In this paper this constraint problem is solved by Teaching learning based optimization(TLBO) on a WSCC-3-Machine-9bus system. Proper desirable time setting multiplier (TSM) with minimum operating time of relays are calculated. We also incorporated intelligent over current relay characteristics selection to get the desired results in this work. The results seem to be satisfactory as the results obtained from TLBO are comparatively better than so called conventional methods like Genetic Algorithm(GA) and Particle Swarm Optimization (PSO).**

Keywords*— *Coordination of relay; Coordination time interval; Teaching learning based optimization; Plug setting; Time setting multiplier; Over current relay characteristics.

I. INTRODUCTION

Relays should be organized such a way that every relay should have a backup and CTI between primary and back up and different zones of the relay should be maintained. Relay co-ordination is necessary to achieve proper fault identification and fault clearance sequence. These relays must be able to distinguish between the normal operating currents including short time over currents that may appear due to certain equipment normal operation(e.g- Motor starting currents, transformer inrush currents) and sustained over current due to fault conditions. During fault conditions , these relays must operate quickly isolating the faulted section of the network and allows for continued operation of the healthy circuits. If primary relay meant for clearance of the fault fails, backup relay must operate after providing for sufficient time discrimination for the operation of primary relays. Hence the operation of back up relays must be coordinated with those of the operation of the primary relays. The flexible settings of the relays (e.g- plug setting , Time multiplier setting and possibly selection of suitable time-current operating characteristics), must be set to achieve the desired objectives.

Over current and distance relays are often used for protection of power system. Now a days this scheme is used in almost all sub-transmission system. To achieve better co ordination , a distance with a distance, an over current with a over current relay and an over current relay with a distance relay must be coordinated. One of them will act as main relay and another one as back up. Proper co-ordination time interval should be maintained between them.

The study of co-ordination of relays was first done among over current relays. Initially it is done by using linear programming method including simplex, two-phase simplex and dual simplex methods[1]-[4]. But the problem regarding using these methods is the solution will not come unless all the constraints are satisfied.

So, people gradually started to use intelligent and meta – heuristic approaches which gives optimal solution instead of exact solution meeting all the constraints criteria. In ref.[5], optimal co-ordination is done by Genetic Algorithm. Ref.[6] shows optimal co ordination by using Particle swarm optimization and Ref.[7] shows the time co ordination by using evolutionary algorithm. But these schemes are having two types of problems. First one is mis coordination and other one is lack of solution for relays with both discrete and continuous time setting multipliers (TSMs). The problems are resolved in [8] by adding a new expression with the objective function. All the above discussed methodologies are done by using over current relays and the relay characteristics are assumed to be fixed. While in digital relays different over current relay characteristics can be selected. So, the algorithm for relay co ordination should be capable of selecting the best fitting characteristics of over current relays to have optimal co ordination.

Ref.[9] shows relay co ordination with an hybrid GA algorithm which is helpful in relay coordination of over current and distance relays. Ref.[10] shows relay co ordination using GA and intelligent relay characteristics selection. Ref.

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Power quality enhancement using particle swarm optimization based shunt active power filter

Power quality Enhancement using Particle swarm optimization based shunt active power filter

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Abstract. The shunt active power filter is one compelling arrangement is utilized for reducing the source current harmonics distortion in nonlinear load distribution system. The synchronous reference frame (SRF) control algorithm is utilized for creating the current controlled reference signals. The acquired reference control signals are compared with hysteresis controller for better switching of shunt active power filters. Generally SRF with PI controlled shunt active power filter are used for harmonic compensation. But, they won't give better results to bigger variety loads. In these papers a particle swarm optimization (PSO) system is proposed for better tuning of PI values of SRF with PSO-PI controlled shunt active power filter. The simulation results without and with conventional PI and furthermore with PSO-PI is analyzed for nonlinear load distribution system.

Keywords: Shunt active power filter, PI controller, PSO-PI controller, Harmonic compensation, synchronous reference frame theory.

1 Introduction

In presently, the vast number utilization of power electronic and nonlinear devices causes harmonic in distribution system [1]. The harmonic distortion may cause power quality issues, for example, low productivity, poor power factor and influence the neighbouring communication lines [2-5]. These issues are repaid by using passive filters. However, these passive filters are huge in size, consistent compensation and low over loading capacity. To keep away from these disadvantages a shunt active power filters with voltage source inverter (VSI) is created for compensation of current source harmonics and for power factor correction [6]. The triggering signals for the VSI based shunt active power filter are gotten from the proposed synchronous reference frame control algorithm with PI controller [7-10]. The DC interface voltage of VSI is normally controlled by utilizing conventional PI control technique. In conventional technique obtained PI values are not agreeable. In this case, by utilizing PSO control program the obtained PI values are exact and keep up the constant dc bus voltage when compared with the conventional PI controller [11, 12]. PSO is an iterative based enhancement method. It is actualized dependent on the behaviour of of bird's flock and fish school. In pso, the particles have with certain velocity and position in a space is taken from the social conduct of creatures. Here population is called swarm. Swarm comprise of number of particles. Every particle in swarm looking through the best position individually encounters and speaks with their neighbouring best position in swarm insight and gets the position and updates their position and velocity. The particle is seen in the best approach to show signs of improvement and better looking position. The updating of velocity of every particle is their very own encounters and in addition involvement with their neighbours. PSO method is increasingly proficient tackling nonlinear, non differential and high dimensional issues [13-15].

In this paper a VSI based shunt active power filter is implemented. Here the Proportional & Integral values of the of PI controller for the DC link voltage is controlled by utilizing PSO program rather than conventional PI control for better harmonic reduction and power factor enhancement. The simulation results with PI and PSO-PI is analyzed in MATLAB/SIMULINK software.

2 Shunt Active Power Filter

Fig-1. Shows the system setup of three phase three wire non linear load distribution system with the proposed shunt active power filter.

The nonlinear load introduces harmonics disturbance at the source side. The harmonics disturbance is eliminated by connecting shunt active power filter. The shunt active power filter comprises of 3-Leg voltage source inverter with dc link capacitor. The voltage source inverter comprises of 6 IGBT switches with anti parallel diodes. The gate signals to IGBT's are gotten from the proposed synchronous reference frame control circuit. The filter inductance L_f is utilized for smoothing the injected compensating currents.

A Novel tehnique to observe the performance of virtual solar PV module system

Innovations in Electrical and Electronics Engineering pp 653–660

A Novel Technique to Observe the Performance of Virtual Solar PV Module System

G. Suresh Babu & N. R. Sai Varun

Conference paper | First Online: 24 March 2020

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 626)

Abstract

Photovoltaic (PV) energy source or a PV emulator is required to analyze the performance of PV equipment under fluctuating conditions. Typical PV modules are costly and static with limited customization abilities. A PV emulator can realize the characteristics of various PV modules under various test conditions (type of locality, climatic conditions, different irradiations, varying temperatures, and various maximum power point tracking (MPPT)

Cite this paper

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18

Significance of festivals and understanding Cultural heritage

Nagadevi Darapureddy

Abstract

Festivals are impalpable cultural assets maintaining the past and passing them to the future generations. Festivals are eloquent to indicate culture, traditions, and heritage. Festivals are celebrated irrespective of caste and religion in the country. It creates relations and a strong bond in humanity. It builds social relations and social communication which leads to unity among the people. The present generation will come to know about our customs and old-age practices during these celebrations. Various festivals have religious inchoation and entwine cultural and religious paramountcy in traditional activities. Festivals can accommodate tourism advantages such as increased visitation and development of a destination's image. Communities experience arrange of benefits from festivals. These benefits include building social cohesion, providing a specific time and place for families and friends to show their commitments to the area, and to provide a socially acceptable area for publications. The main aim of this article is to represent the significance of festivals, the main festival which is celebrated grandly in every state

Advances in Decision Sciences, Image Processing, Security and Computer Vision pp 327–334

An Experimental System Level Performance Analysis of Embedded Systems for GSM Application

M. Rajendra Prasad & D. Krishna Reddy

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Part of the Learning and Analytics in Intelligent Systems book series (LAIS,volume 4)

Abstract

As per the requirement of embedded industry domain the processor system level performance has to be evaluated and tuned to match the required constraints of an application specification, so system level design methodology for embedded application-specific development system is becoming challenging. A novel System Level Design Methodology (SLDM) is developed to implement system level computational platform to evaluate the system level performance, investigate the system level issues and performance improvements of

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Comparative Analysis of Serial and Parallel Satellite Positioning Algorithms for GPS and NavIC

K. Sudershan Reddy ✉, Md. Khaja Rahmatullah, Sameeha Fahmeen, Quddusa Sultana & D. Krishna Reddy

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Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 601)

Abstract

India has established its native satellite navigation system called as Indian Regional Satellite Navigation System (IRNSS) which is officially named as Navigation with Indian Constellation (NavIC). Global Positioning System (GPS) is an all-round, all weather, real time global satellite navigation and positioning system developed by US. In these systems, the time needed for the computation of satellite positioning affects the accuracy of the final observation point positioning. However, as GPS is widely used in real

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

International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249 – 8958, Volume-8, Issue-6S3, September 2019

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

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

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

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

I. INTRODUCTION

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

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

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

II. ANTENNA CONSTRUCTION AND DESIGN

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

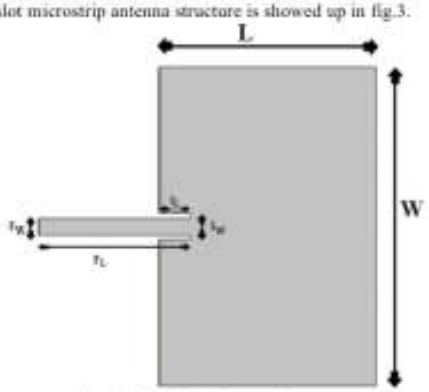

Fig. 1. Inset fed microstrip antenna

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

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

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ABSTRACT

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

Key words: FRB, Instrumental Delay, SVD, SCORE

1. INTRODUCTION

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

2. SINGULAR VALUE DECOMPOSITION ALGORITHM

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

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

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

[E, S, A] = elevation (receiver(x,y,z),satellite(X,Y,Z)) (1)

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

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

TEC=(P2-P1)/40.30*($f1^2 * f2^2$)/($f1^2 - f2^2$) (2)

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

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

STEC= Slant factor*TEC-(fitted biases) (3)

Where, Slant factor is estimated from,

1+(16*((0.53-elev).^3)) (4)

"Augmentation of NavIC with GPS Over Indian Region"

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Augmentation of NavIC with GPS Over Indian Region

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ABSTRACT

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

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

1. INTRODUCTION

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

2. OVERVIEW OF GPS AND NAVIC

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

The NavIC has three segments. They are: Space segment, Ground segment and User segment. The NavIC space segment has a constellation of 7 satellites, orbiting above the earth at a height of 36000 km approximately. Out of 7 satellites, 3 satellites are placed in Geostationary Orbit (GEO) and 4 satellites are placed in Geosynchronous Orbits (GSO). NavIC satellites in Geosynchronous Orbits (GSO) are at a height of 36000 km, and are inclined at an angle of ±29° with the equator [3]. Due to this inclination, satellites provide coverage to the higher and lower latitudes near the poles. In Geostationary Orbit (GEO) they remain above the equator.

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

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

Preliminary Performance Analysis of IRNSS in Sea Environment”

"Configuring Artificial Neural Network by using Optimization Techniques to Recognize Speaker Voice"

Forecasting of Ionospheric Scintillations by using Statistical Models

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Global Positioning System (GPS) signals when propagate through ionosphere, experience random amplitude and phase fluctuations due to ionospheric irregularities. The variations in amplitude and phase if severe enough, degrade the receiver position accuracy and may result even complete loss of lock. The occurrence of ionospheric scintillations depends on geographic area, time of the day, solar cycle and season. From the literature, the occurrence of scintillations is more in low latitude region, medium at polar region and low at mid latitude region. Forecasting of scintillations is necessary in strategic applications to avoid the disruption of services. Significant work on forecasting TEC over low latitude region is reported, but not much on forecasting scintillations. In this paper, various forecasting statistical models like Holt-Winter (H-W), Exponential Smoothing (ES) and Grey Model (GM)) are used for forecasting amplitude (S_4) and phase (σ_ϕ(rad)) scintillations of GNSS signals. In the present analysis, the Golden Section Search method is used for optimization of statistical errors for better performance. The Golden Section Search method provides the optimum values of smoothing coefficients (α, β and γ) for achieving the minimum statistical error. For this analysis, GAGAN TEC receiver data (2016) of low latitude station Hyderabad is considered. Acquired data is segregated into 4 seasons namely winter (January and February), pre-monsoon or summer (from March to May) and southwest monsoon or rainy (from June to September) and post monsoon or autumn (from October to December) according to India Meteorological Department (IMD) and is used for analysis. Finally, the forecasted results are compared with observed scintillations for evaluating the performance of models in terms of various statistical parameters like Standard Deviation (SD), Mean Square Deviation (MSD), Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE) and Mean Percentage Error (MPE). The forecasted results due to considered models are satisfactory. Our preliminary results indicate that the performance of Grey model is better than the rest of the models.

“Comparative Performance Analysis of Galileo and NavIC at a Low Latitude Station

Comparative Performance Analysis of Galileo and NavIC at a Low Latitude Station

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Galileo is an emerging civilian controlled Global Navigation Satellite System (GNSS), being developed by European Space Agency (ESA) and European Union (EU). Galileo comprises of 30 MEO (Medium Earth Orbit) satellites constellation. Currently, 17-satellites are operational and are visible from India at different times. The NavIC (Navigation with Indian Constellation) is an independent and indigenous regional navigation system developed by ISRO, India. NavIC is a seven satellites constellation, three are geostationary and four are geosynchronous satellites, and provides continuous visibility over Indian region. The Galileo operates on L-band (1-2 GHz) whereas NavIC operates on both L-band and S-bands (2-4 GHz). The advantage of S-band is ionospheric delay is relatively less, but susceptible to interference. Galileo's received signal power levels are 3dB higher than NavIC. For evaluating the comparative performance of Galileo and NavIC, 24-hours data form two static-mode receivers with 5^0 mask-angle located at Osmania University, Hyderabad (17°24'28.07"N, 78°31'4.26"E) are considered for two continuous days (8 and 9 August 2018). During a whole day, 3-8 Galileo satellites are visible; whereas a minimum 4 satellites are available for about 4-5 hours. Often, Galileo DOP's values (1.5) are better than NavIC DOP's (2.5). A good Galileo satellite geometry results in best GDOP (1.88) and PDOP (1.70) better than NavIC when four or more satellites are visible. For a dual frequency receiver with 99% of service to public, the Galileo horizontal position accuracy (4-meters) is better than NavIC horizontal accuracy (5-meters). The Galileo satellites E3, E7 and E25 are at high elevations (>60^0) and therefore, experience less propagation effects due to troposphere and ionospheres and are useful to obtain better accuracy. In contrast to GPS, the high elevated satellites are useful for low latitude and polar region's weather monitoring. It is likely that, NavIC with Galileo satellites rather than GPS will provide more precise and reliable GNSS applications and services in low latitude regions.

Ref: Devadas kuna, N. Santhosh, P. Naveen Kumar and A.D. Sarma **"Comparative Performance Analysis of Galileo and NavIC at a Low Latitude Station"** on 20th symposium NSSS-2019 **(National Space Science Symposium),** 29-31 January 2019, **Savitribai Phule Pune University, Pune.**

"IRNSS and GPS Satellite User Range Accuracy Analysis for Receiver Autonomous Integrity Monitoring
"

“Predictive Data Optimization of Doppler Collision Events for NavIC System”

"Development of Raspbian kernel Customization for Automatic Railway Level Crossing Application"

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Development of Raspbian kernel Customization for Automatic Railway Level Crossing Application

Sathish Pasika, D. Krishna Reddy, N. Alivelu Manga

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

Index Terms: **Raspbian OS, Customization, Web server, Internet of Things**

I. INTRODUCTION

Linux is an open-source operating system in which the source code of the kernel is freely available and can be customized for various applications based on their specifications.

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

II. RASPBIAN FILE STRUCTURE

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

bin - a standard subdirectory that contains executable programs

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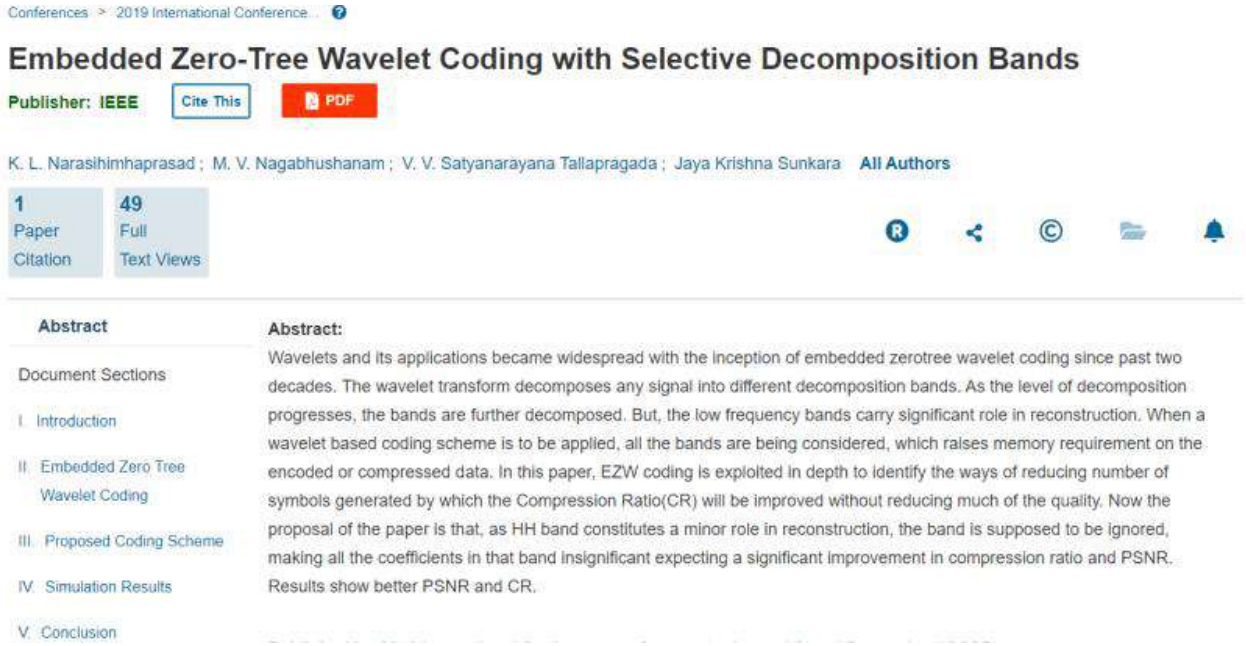
"Performance Analysis of Acquision Algorithms of NavIC"

“Embedded Zero-Tree Wavelet Coding with Selective Decomposition Bands”



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Embedded Zero-Tree Wavelet Coding with Selective Decomposition Bands

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1 Paper Citation | 49 Full Text Views

Abstract

Document Sections

I. Introduction

II. Embedded Zero Tree Wavelet Coding

III. Proposed Coding Scheme

IV. Simulation Results

V. Conclusion

Abstract:
Wavelets and its applications became widespread with the inception of embedded zerotree wavelet coding since past two decades. The wavelet transform decomposes any signal into different decomposition bands. As the level of decomposition progresses, the bands are further decomposed. But, the low frequency bands carry significant role in reconstruction. When a wavelet based coding scheme is to be applied, all the bands are being considered, which raises memory requirement on the encoded or compressed data. In this paper, EZW coding is exploited in depth to identify the ways of reducing number of symbols generated by which the Compression Ratio(CR) will be improved without reducing much of the quality. Now the proposal of the paper is that, as HH band constitutes a minor role in reconstruction, the band is supposed to be ignored, making all the coefficients in that band insignificant expecting a significant improvement in compression ratio and PSNR. Results show better PSNR and CR.

" Deep learning-basedfire fighting robot"

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9th & 10th April 2019, Chennai, India

65. DEEP LEARNING BASED FIRE FIGHTING ROBOT

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

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"Augmentation of NavIC-11 with BEIDOU-3 Over Indian Region"

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

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

Keywords*—*BeiDou-3, NavIC, satellite visibility, DOP

I. INTRODUCTION

Recently, India has developed its individual navigation satellite system to cater both civilian and defense requirements, called as Indian Regional Navigation Satellite System (IRNSS) with an operational name of Navigation with Indian Constellation (NavIC). It provides real-time positioning and timing services. Presently, the NavIC, called as NavIC-7, comprises of 7 satellites, with 3 launched in Geostationary Orbit (GEO) and 4 in Inclined Geosynchronous Orbit (IGSO) [1]. The future constellation of NavIC will be of 11 satellites, called NavIC-11. NavIC-11 will increase the coverage to extended regions of northern and southern parts of India, and even the Polar Regions, by placing the new 4 satellites highly inclined in Geo Synchronous Orbits (GSOs). Though, presently NavIC-7 is sufficiently good for social applications but for critical applications it needs to get supplemented with other navigation systems. The other visible global navigation satellite systems visible over India are GPS, GLONASS, Galileo of Europe and Chinese BeiDou-3.

The BeiDou System (BDS) is a navigation system developed by China. It is been developed in three phases. The first phase called BeiDou-1 (since 2000) had only 3-4 satellites which were launched for experimental reason. The second phase is named BeiDou-2 also called as COMPASS. It is a home-grown system with a constellation of 10 satellites which became operational in 2011. Since December 2012, it has been offering services in the Asia-Pacific region [2]. The modernization plan of BeiDou-2 is characterized as BeiDou-3. The first BeiDou-3 satellite was launched on 30th March, 2015. As of January, 2018, nine BeiDou-3 satellites have been launched. By 2020, BeiDou-3 is planned to have 35 satellites in which 5 are Geostationary Orbit (GEO), 27 are Medium Earth Orbit (MEO) and 3 are Inclined Geo Synchronous Orbit (IGSO) [2]. This paper focuses on the augmentation of proposed constellation of NavIC-11 and BeiDou-3 over Indian region. Estimation of DOP value which is a function of satellite geometry is very important in assessing the performance of the navigation system. This aspect is also considered in this paper.

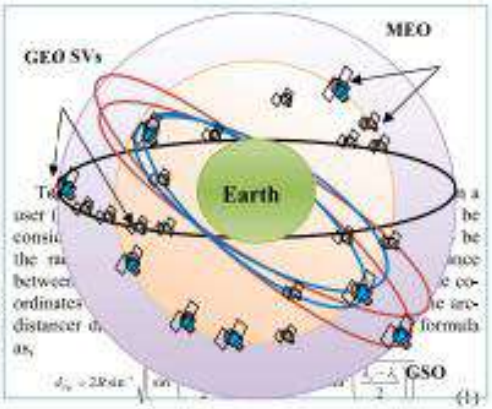
II. OVERVIEW OF NAVIC AND BEIDOU-3

NavIC is a self-governing regional and native satellite navigation system. NavIC-7 provides position precision of < 20 m throughout India. There are future plans to extend NavIC-7 system by escalating constellation size from 7 satellite vehicles (SVs) to 11SVs [3]. NavIC-11 is intended to provide position accuracy of < 10 m over India and beyond it.

China started to build up the third generation BieDou system called BeiDou-3, a global one, in 2015 (Fig. 1). The Beidou-3 uses satellites in MEO, GEO and IGSO. BeiDou-3 SVs are already in operation for the Chinese and Asia-Pacific Area with global availability planned to be completed by 2020 [4]. The details of the BeiDou satellites are mentioned in Table I.

TABLE I. SATELLITE VEHICLES OF BEIDOU-3

Block	Launch Period	Satellite Launches			Currently in Orbit
		Success	Failure	Planned	
BeiDou-1	2000-2007	4	0	0	0
BeiDou-2	From 2007	10	0	0	10
BeiDou-3	From 2015	9	0	26	9
Total		23	0	26	19



IV. RESULTS

NavIC-7 satellite locations are provided in open literature [5]. Data on proposed satellite locations for NavIC-11 is collected from Indian Space Research Organization (ISRO).The data on proposed satellite locations of BeiDou-3 satellites is collected on 15th October, 2018 at four different epochs i.e. 6:00am, 6:00pm, 12:00am and 12:00pm from a website [6]. The NavIC-11 IGSO satellites trace dumbbell shaped orbits, as for the observer on the ground. When the satellites are at maximum inclination they are said to form the best configuration. This configuration forms at two epochs as per Indian Standard Time (IST). They are 06:00am (Best case-1) and 06:00pm (Best case-2). The satellite configuration at four different

" A Scheme for Latency Analysis of Different Cryptography Methods for Security in 5G Era"

A Scheme for Latency Analysis of Different Cryptography Methods for Security in 5G Era

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***Abstract*—In this paper, we present a scheme for performance analysis of different cryptography methods namely symmetric ciphers, and asymmetric ciphers to encrypt and decrypt the text, and audio data for online secure data access in the browser window using LabVIEW approach on myRIO hardware module for 5G systems. In this work, the text message with the different payloads is encrypted and decrypted. Similarly, the same process repeated for audio data. First, the text, and audio data are converted into string format; then the data format is encrypted using different cryptography methods from the sender side. On the receiver side, same cryptography method is used to decrypt the data with a generated key associated among the parties. In the case of symmetric ciphers, AES, Blowfish, DES, and IDEA are used to encrypt and decrypt the data. Further, the asymmetric ciphers, RSA, ECC, and DSA are used to encrypt and decrypt the data. LabVIEW programming tools are used to develop a scheme of cryptography methods. Finally, latency analysis is made on text, and audio data with symmetric and asymmetric ciphers.**

***Index Terms*—Symmetric ciphers, AES, Blowfish, DES, IDEA, asymmetric ciphers, RSA, ECC, DSA**

I. Introduction

The Pervasive computation process in the 5G era plays a crucial role to understand data security [1]. The Cryptography methods, namely symmetric and asymmetric ciphers, are used for encryption and decryption on text, and audio data by sharing a private and public key between the sender and receiver. When selecting a cryptography algorithm for 5G user case, low area, low power, and low latency options are to be considered. The first two terms are to be considered for area and power constrained applications. Certain applications are more effected by latency rather than throughput, such applications require low latency. The latency is to be considered for applications that require low latency. The fifth generation (5G) communications have to support a multitude of services. The URLLC (ultra-reliable low latency communications) is one of the services to be supported by 5G. URLLC transmission, that requires a short information block lengths at low code rates with a low BLER (block error rate) at low error flows. URLLC is required for ultra-reliable and latency-sensitive applications and services. In contrast to the current communication systems that are modeled for human-to-human (H2H) interactions, URLLC aim to human-to-machine (H2M) [2] interactions and high reliable machine-type interactions such as telesurgery, factory automation, autonomous vehicles, tactile internet, and remote control. All of these applications have the most strict requirements on low latency, which cannot be accomplished in Long-Term Evolution (LTE) systems. However, the performance analysis of different cryptography methods based on audio files for low latency applications is lacking in literature. Therefore, in this paper, a scheme is proposed for comparative timing analysis of various cryptography algorithms using LabVIEW.

II. Proposed Scheme

The block diagrams of the proposed schemes based on symmetric ciphers and asymmetric ciphers are shown in Figs.1 and 2, respectively.

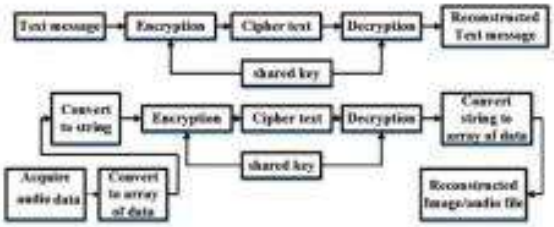

Fig. 1. Block diagram of symmetric ciphers on text, and audio signals

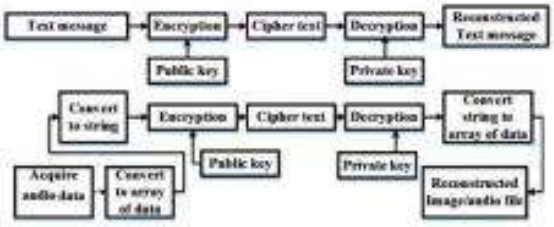

Fig. 2. Block diagram of asymmetric ciphers on text, and audio signals

The text message is encrypted with the shared key, and then converted into a ciphertext; again at the receiver, it is

"Low cost IoT based emission monitoring system for thermal power plan"

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Low Cost IoT Based Emission Monitoring System for Thermal Power Plants

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***Abstract*— Nowadays, Internet of Things (IoT)) has turn out to be a part of an Embedded system for controlling and monitoring purposes. Monitoring of gases produced by thermal power plants is very much essential to mitigate their impact on the environment like air pollution also, to prevent health hazards to human beings. In this paper, an attempt is made to design IoT based Embedded application, a prototype, which is specifically developed for monitoring toxic gases released by thermal power plants. This system measures the concentration levels of Carbon Monoxide (CO), Particulate Matter (PM) released by thermal power plants. Various sensors are used to measure the concentration levels of the gases. Node MCU is used, to read data from the sensors and send it to the cloud using ESP8266 module. The data can be monitored by the environmental agency, either by using web application (Thingspeak) or mobile application (Blynk app). If the measured data is greater than the emission standards, an email notification is send to the Power Plant agency and they may initiate to limit the toxic emissions.**

Keywords—Internet of Things, Sensors, ESP8266, NodeMCU

I. INTRODUCTION

Air pollution is the major concern nowadays. It is causing serious effects on human health, animals, environment etc. it can be caused by nature(volcanic erosions) and human activities(industries). Percentage cause of air pollution due to nature is less than the cause of air pollution by human activities. Air pollution challenges facing today include: limiting climate change, reducing risk from toxic air pollutants, meeting health based standards for common air pollutants and protecting the stratospheric ozone layer against degradation [1]. Today, Industries and automobile vehicles are the major cause for air pollution. World Health Organization (WHO) says, ambient air pollution accounts for an estimated 4.2 million deaths per year due to stroke, heart disease, lung cancer and chronic respiratory diseases. Around 91% of the world's population lives in places where air quality levels exceed WHO limits. While ambient air pollution affects developed and developing countries alike, low- and middle-income countries experience the highest burden, with the greatest toll in the WHO Western Pacific and South-East Asia regions [2]. Adverse health consequences to air pollution can occur as a result of short- or long-term exposure. The pollutants with the strongest evidence of health effects are Particulate Matter (PM), Ozone (O_3), Nitrogen dioxide (NO_2), Sulphur dioxide (SO_2), Carbon monoxide(CO), Carbon dioxide (CO2)[3]. To limit the emission of these pollutants in air caused by industries, WHO working with countries to monitor air pollution and improve air quality by setting emission standards and guidelines to industries [4]. Since Monitoring of air quality plays a major role in improving the air quality, the new emerging technologies can be used for monitoring, like Internet of Things with sensors. Internet of things has become the trending technology nowadays, since it connects the devices. It can be used as a system, which connects various computing devices, mechanical and digital machines, objects, to develop specific application. It has the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction [5]. Hence, it is widely used in various applications such as emission monitoring system.

Thus, in this paper a prototype is designed that can be implemented in real world which is of low cost. System uses NodeMCU, which is an open source platform of IOT. By using it, dust sensor (PM2.5) and carbon monoxide (MQ7) is used for measuring the dust particles and CO composition emission by power plants. Thingspeak and Blynk mobile app is used for data display and monitor purpose. An email notification will be send to the client if the CO and PM levels are above threshold values by using If This, Then That (IFTTT) notification service.

Section II says about the related work has been done for air quality monitoring. Section III gives the brief description of the system architecture and Section IV explains about the different hardware and software components which are used in system. Section V shows the experimental setup and the relevant results and discussions. Conclusion is seen in section VI.

II. RELATED WORK

An air pollution monitoring system is introduced in which Nucleo F401RE is used to read data from the sensors and Wifi module for sending the data to application [6]. Raspberry pi 3 is used as a gateway and base station. It receives data, stores it. Using Mean stack data visualization is done.In [7] air quality monitoring system is developed which uses NodeMCU for controlling and it uses DTH11 sensor for temperature and humidity measuring, MQ-135 for measuring smoke, gases and other sensors. In this, NodeMCU acts as publisher for Message Queuing Telemetry Transport (MQTT) broker and NodeRED as subscriber. Node red is used for data receiving purpose as well as data display by using NodeRED dashboard. If the

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"Augmentation of NavIC with BeiDou-2 Over Indian Region"

Augmentation of NavIC with BeiDou-2 Over Indian Region

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Abstract—**This paper focuses, initially, on the study of satellite visibility of augmented NavIC with BeiDou-2. Comparative analysis of NavIC and NavIC augmented with BeiDou-2 is also performed in terms of Dilution of Precision (DOP). DOP is a term used in satellite navigation to stipulate the supplementary multiplicative result of navigation satellite geometry on positional measurement precision. The augmentation has caused improvement in the satellite visibility and DOP.**

Keywords—BeiDou-2, NavIC, Satellite Visibility, DOP

I. Introduction

Today, multiple constellations of navigation satellites from the U.S, Russia, China and Europe orbit the Earth, providing numerous location-based services for consumers, businesses, militaries and civil aviation. With the launch of India's IRNSS in orbit, India now has an operational regional satellite navigation service developed by Indian Space Research Organization (ISRO) to meet its security requirements since 2016, and updated in April, 2018 [1] [2]. IRNSS is also known as Navigation with Indian Constellation (NavIC). NavIC provides an absolute position accuracy of better than 10m throughout Indian landmass and better than 20m in the Indian Ocean.

Though NavIC is expected to provide navigation services with sufficient accuracy, its accuracy can be enhanced through a technique called augmentation. For augmentation, other satellite navigation systems visible over India can be taken into consideration. This paper focuses on the augmentation of NavIC with BeiDou-2.

The BeiDou System (BDS) is a Chinese satellite navigation system. It is been developed in three phases [3]. The first phase was for experimental purpose, called BeiDou-1 (since 2000) had only 3-4 satellites. It was decommissioned in 2012 [4]. The second phase is named BeiDou-2 also called as COMPASS. It is a regional system and become operational in 2011 with a constellation of 10 satellites. Since December 2012, it has been offering services to navigators in the Asia-Pacific region [5].

II. Overview of NavIC and BeiDou-2

NavIC provides two levels of service, the Standard Positioning Service (SPS) for open use and a Restricted Service (RS) for authorized users. The space segment of NavIC consists of a constellation of seven satellites [1], orbiting around the earth at an altitude of around 36,000 km. The satellites are launched at various locations to provide navigation primarily over India. Three satellites are placed in Geostationary Orbit (GEO) and four satellites are placed in Geosynchronous Orbits (GSO). Satellites in GSO are inclined at an angle of ±29° with the equator. Due to this inclination, they provide coverage to the higher and lower latitudes near the poles [6].

BeiDou-2 provides two levels of services, a free service to civilians and licensed service to the Chinese government and military. The free civilian service has a 10m location-tracking accuracy. Clocks have an accuracy of 10 ns, and provide speed within 0.2 m/s error. The restricted military service has a location accuracy of 10 cm [7]. Presently, the BeiDou-2 constellation consists of 19 satellites. By 2020, the BeiDou orbital constellation will include 35 satellites [8].

III. Estimation Of Satellite Visibility

To find the number of satellites (SVs), visible from a given point on earth, the sub-satellite point (P) on the ground should be taken into consideration. Assuming 'R' to be the radius of the earth, i.e., 6371km approximately, arc-length d_{PQ} to be the radius of coverage area, on the surface of the earth and arc-length d_{PQ} be the arc-distance between the sub-satellite point (P) and the user (Q). Let the co-ordinates of point P be (λ_1,Θ_1) and the co-ordinates of point be (λ_2,Θ_2). Using Haversine formula, the expression for d_{PQ} can be written as,

$$d_{PQ} = 2R\sin^{-1}\sqrt{\left|\sin^2\left(\frac{\theta_2-\theta_1}{2}\right)+\cos(\theta_1)\cos(\theta_2)\sin^2\left(\frac{\lambda_2-\lambda_1}{2}\right)\right|} \quad (1)$$

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” Design of an area efficient Braun Multiplier using high speed parallel prefix adder in cadence"

Design of an Area Efficient Braun Multiplier using High Speed Parallel Prefix Adder in Cadence

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***Abstract*— Matrix multiplication is one of the most fundamental part of digital signal processing systems and is also used as a recursive routine in many signal processing and computational problems. The circuit complexity mainly depends on the multiplication count required for developing the system. Parallel array multiplier is the solution for achieving high execution speed demands. A conventional Braun multiplier includes an array of 16 AND gates, 9 Full Adders, and a ripple carry adder (RCA) in the final stage. A new design of Braun replaces RCA with Kogge-Stone Adder (KSA) for performing faster multiplication. Two designs of KSA are proposed using 14T XOR and 12T XOR gates. A conventional Braun multiplier and Braun multiplier with KSA are designed in cadence Virtuoso tool for 180nm technology with 1.8V source. It is observed that the area reduces by 258 transistors and delay is decreased by 4.65 ns.**

Keywords*—*Digital Signal Processors (DSP), Ripple carry adder (RCA), Kogge-Stone adder (KSA).

I. INTRODUCTION

The advances made in VLSI technology both in terms of speed and size, have made possible the hardware implementation of parallel multipliers. The growth of technology further ensures enhanced performance characteristics and widespread use in DSP systems. It performs such operations as accumulating the sum of multiple products much faster than an ordinary microprocessor. The DSP architecture is so designed that it performs parallel operation and thus reduces the computational complexity and enhances the speed for repetitive signal processing required for such applications.[1]. These features are designed in the programmable DSP to higher speed and throughput. For a given application, there is a large number of programmable DSPs to choose from, based on such factors as speed, throughput, arithmetic capability, precision, size, cost and power consumption [2]. The advent of single-chip multipliers and their integration into microprocessor architecture is the most important reasons for the availability of commercial VLSI chips capable of DSP functions. These multipliers are called parallel or array multipliers [3]. Generation of product of two binary numbers requires a single processor cycle. Earlier, either a software based shift and add algorithm or one using micro-coded controllers, which implement same algorithm in hardware were used as popular multiplication schemes. Both these options require several processor cycles to complete multiplication. Kogge-Stone Adder (KSA) is a design of parallel prefix adders using XOR and AND gates [5],[6]. Conventional multipliers designed with 22T XOR or 16T XOR gates. 3T XOR, 6T XOR and 10T XOR models are already available but these have the problem of threshold loss [7],[8].12T XOR gate is preferred for current design of KSA, that gives full swing output[9]. In this work, Braun Multiplier with Kogge-Stone Adder is used for decreasing the area and delay.

II. CONVENTIONAL BRAUN MULTIPLIER

Braun multiplier is built conventionally in CMOS technology. All the basic building blocks that form the multiplier use CMOS technology. It has 16 AND gates and 12 FULL ADDERS FA1 to FA12 .

"Augmentation of Modernized CAPS with NavIC Over Indian Region"

Augmentation of Modernized CAPS with NavIC Over Indian Region

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Abstract— **India has developed its indigenous regional navigation satellite system called as Indian Regional Navigation Satellite System (IRNSS). IRNSS is given an operational name as Navigation with Indian Constellation (NavIC). NavIC satellite constellation is planned in such a way that at least four satellites are visible over India and 1500km outside its boundary. Satellite visibility of NavIC indicates its ability to provide navigation services. Knowledge of satellite visibility is vital as it is a significant parameter to analyze the accuracy of the user position. Moreover, to increase user position accuracy, the NavIC can be supplemented with other navigation satellite systems, such as Global Positioning System (GPS) of US, Global Navigation Satellite System (GLONASS) of Russia and Chinese Area Positioning System (CAPS) of China. The CAPS is a regional navigation satellite system developed by National Astronomical Observatories of China (NAOC). This paper focuses, initially, on the analysis of satellite visibility of standalone CAPS, over India. Eventually, satellite visibility of augmented CAPS with NavIC is paid attention. Comparative analysis of CAPS and CAPS augmented with NavIC is also performed in terms of Dilution of Precision (DOP). DOP is a factor which indicates the accuracy of the user position. The augmentation has caused improvement in the satellite visibility and DOP.**

Keywords—CAPS, NavIC, Satellite Visibility, DOP

I. Introduction

GPS has been considered as a sufficiently good navigation satellite system by the whole world. However, one's nation's security requirements demand independent navigation systems. In this respect, Indian Space Research Organization (ISRO) of India has developed its indigenous navigation satellite system called Indian Regional Navigation Satellite System (IRNSS) and is operational since 2016, and updated in April, 2018 [1] [2]. IRNSS is also known as Navigation with Indian Constellation (NavIC). NavIC provides military as well as civil services.

Though NavIC is expected to provide navigation and guidance with good accuracy, its accuracy can be enhanced through a technique called augmentation. For augmentation, other satellite navigation systems visible over India can be taken into consideration. This paper focuses on the augmentation of CAPS with NavIC.

CAPS is a passive one-way navigation satellite system of China. CAPS development was initiated in 2002 based on a proposal by National Astronomical Observatories of China (NAOC), Chinese Academy of Science (CAS) [3].

II. Overview Of NavIC And CAPS

The NavIC has three segments. They are space segment, ground segment and user segment. Ground segment basically comprises of a Mater Control Station, Monitoring stations and transmitting antennas. The space segment has a constellation of seven satellites (Table 1), orbiting around the earth at an altitude of around 36,000 km. The satellites are launched at various locations to provide navigation anywhere over India, and its neighboring countries. Three satellites are placed in Geostationary Orbit (GEO) and four satellites are placed in Geosynchronous Orbits (GSO). Satellites in GSO are inclined at an angle of ±29° with the equator. Due to this inclination, they provide coverage to the higher and lower latitudes near the poles [4].

CAPS consists of a ground segment, a user segment and an space segment. Space segment broadcasts navigation messages, uploaded from the ground segment [5]. The CAPS constellation consists of six commercial GEO communication satellites and an Inclined GSO (IGSO) satellite [3] [6]. To modernize CAPS, two more satellites are planned in IGSO with a phase difference of 120° each as shown in Fig. 1 and Table II [6]. Further, CAPS uses the communication satellites to assimilate the navigation and communication features.

TABLE I: Satellite Vehicles Of NavIC

	NavIC Satellite Locations			
Sl.No.	*Satellites*	*Longitude*	*Altitude(km)*	*Inclination*
1.	IRNSS-1H	55°E	Perigee:35701; Apogee:35881	27.39°
2.	IRNSS-1B	55°E	Perigee:35714; Apogee:35870	30.57°
3.	IRNSS-1C	83°E	Perigee:35697; Apogee:35889	4.78°
4.	IRNSS-1D	111.75° E	Perigee:35750; Apogee:35884	30.43°
5.	IRNSS-1G	111.75° E	Perigee:35791; Apogee: 35948	28.4°
6.	IRNSS-1E	32.5°E	Perigee: 35716; Apogee: 35872	4.6°
7.	IRNSS-1F	131.5° E	Perigee: 35778;Apogee: 35805	4.7°

"Analysis of Telugu Hand Written Characters using Transform based Techniques"

"IRNSS User Range Accuracy Evaluation for Receiver Autonomous Integrity"

IRNSS User Range Accuracy Evaluation for Receiver Autonomous Integrity

Publisher: IEEE Cite This PDF

D. Sony ; V. Satya Srinivas ; P. Naveen ; D. Krishna Reddy All Authors

Abstract:
Civil aviation is one sector that immensely will get benefited from Indian Regional Navigation Satellite System (IRNSS) services. However, for safety of life applications, integrity of navigation solution is crucial. Integrity of the system depends on Signal-in-Space (SIS) errors. The user range accuracy (URA) transmitted in navigation message for each satellite is a conservative estimate of SIS error and can be mainly used for integrity monitoring. Therefore, investigation of URA is important. Further, for development of receiver autonomous integrity monitoring algorithm for IRNSS, the typical value of URA has to be defined. In this paper, the cumulative distribution of URA is analyzed to over bound SIS errors. The sigma URE for 68% over bound is 2.8m.

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Feasibility of Soft Real-Time Operations Over WLAN Infrastructure-Independent IoT Implementation by Enhancing Edge Computing

Data Engineering and Communication Technology pp 223–230

Feasibility of Soft Real-Time Operations Over WLAN Infrastructure-Independent IoT Implementation by Enhancing Edge Computing

Sujanavan Tiruvayipati & Ramadevi Yellasiri

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Abstract

The subsequent generation of IoT devices must work on a multi-protocol architecture to facilitate M2M communication along with endpoint user interfacing to solve the network infrastructure dependencies accompanied by redundant data flow overhead. An ideological solution is proposed to facilitate a change while cutting down infrastructure cost and enhancing the current setups through proper implementation of edge computation. End devices cooperate with each other along with providing GUI and Internet to

Telangana, India

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Recommended System For Wellness Of Autistic Children Using Data Analytics and Machine Learning

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Abstract: Autism is a mental condition which hinders social and communication skills. It's a lifelong disability which makes the child's day to day life very difficult. But in most of the cases early intervention has helped the children to develop the skills which are needed to the fullest to overcome autism. As early the intervention, better the development of the child. Most of the research has been carried out to detect the autism using various machine learning algorithms which consider autistic diagnostic tools such as ADI-R, ADOS or CARS. Once autism is detected, different areas which need to be developed are considered and recommendations are given to the child. In this paper, a system is proposed which uses multi dimensional data collected from facp, DST and Diet to perform analytics using machine learning and provide recommendations to the child.

Keywords: Autism, Functional Assessment Checklist for Programming (facp), Developmental Screening Test (DST), Diet.

1. Introduction

Autism is a spectrum condition which hinders with the daily activities. The child will not be able to communicate properly, lack of fine motor skills and poor eye contact. They will be more interested in rotating objects such as fans, wheels etc. It's a lifelong disability but the early intervention plays a major role. If the disease is detected early, the child can develop the skills required and overcome the symptoms of autism. Most of the research has been carried out to detect autism is in the direction of developing machine learning algorithms which uses autistic diagnostic tools such as ADI-R,ADOS and CARS to check the accuracy of the machine. But there can be other factors which can be the cause for the existing condition. So, In this paper we are considering multi dimensional data collected from facp, DST and Diet to do the analysis. The rest of the paper is organized as follows: Autism, Machine learning in autism, facp, DST, Diet, Recommended system, Conclusion and Future scope.

2. Autism

Autism is a spectrum condition which causes different disabilities such as lack of communication skills, social skills and fine motor skills. The symptoms include unable to utter a word by the age of 2, not responding to name calling, strict compulsion of daily routine, repetitive movements like head banging, spinning, and hand flapping, no sitting tolerance, not aware of danger, and echolia. The child will be assessed by the pediatrician during their regular visit and if any of the symptoms are found will be referred to the experts. The psychologists will examine the child behavior and use various screening tools like Ages and Stages Questionnaires (ASQ)(1 month to5.6 years),Communication and Symbolic Behavior Scales (CSBS)(6 months and 24 months),Parents' Evaluation of Developmental Status (PEDS)(birth to 8 years),Modified Checklist for Autism in Toddlers (MCHAT)(16 to 30 months of age),Screening Tool for Autism in Toddlers and Young Children (STAT) (24 and 36 months of age) to initially check for the

Viality of uncomplicated IoT SaaS Development for Deployment of DIY applications over HTTP with Zero Investment

Advances in Decision Sciences, Image Processing, Security and Computer Vision pp 206–213

Viability of an Uncomplicated IoT SaaS Development for Deployment of DIY Applications Over HTTP with Zero Investment

Sujanavan Tiruvayipati & Ramadevi Yellasiri

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Abstract

IoT administrations are ordinarily conveyed of IoT as physically disconnected vertical arrangements, in which all framework segments running from tangible gadgets to applications are firmly coupled for the prerequisites of each explicit venture. The productivity and versatility of such administration conveyance are naturally constrained, presenting noteworthy difficulties to IoT arrangement developers. In this context, we propose a novel SaaS structure that gives basic stage administrations to IoT

Dr. Margarita N. Favorskaya

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A novel framework for quality of service aware vertical handover process in heterogeneous wireless networks

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A novel framework for quality of service aware vertical handover process in heterogeneous wireless networks

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A novel framework for quality of service aware vertical handover process in heterogeneous wireless networks

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Abstract. The evolution of wireless communication technology and the growing number of mobile users with various applications together have formed a heterogeneous environment of wireless communication networks with real-time availability and high bandwidth preferences. Everyone in the world wants consistent mobility to connect seamlessly to the best available network anytime and anywhere. Therefore, an efficient and Quality of Service (QoS) aware Vertical Handover (VHO) techniques are needed when the mobile connections have to switch from one network to another network to provide effective mobility performance, seamless connectivity, and high availability of connections. Applying efficient VHO process in a heterogeneous wireless network is still a big topic of interest in research field. It has been observed that existing handover techniques are not much capable of providing user preference and QoS aware mobile communication and network selection process. This problem incorporates various unwanted factors such as communication delay, inconsistent mobility, security towards the communication process. This paper discusses various existing research works that have been carried out to improve the VHO process to boost overall communication performance and to raise QoS of wireless mobile communications in the heterogeneousnetworks.

Keywords: wireless communication, vertical handover, heterogeneous networks, quality of service.

Web of Things an intelligent approach to solve interoperability issues of Internet of Things communication protocols

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Web of Things an intelligent approach to solve interoperability issues of Internet of Things communication protocols

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Web of Things an intelligent approach to solve interoperability issues of Internet of Things communication protocols

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Abstract. Internet of Things (IoT) is an emerging technology now in a days. It allows each and every physical thing to communicate with each other through internet. To establish communication among physical things they require some communication protocols like hypertext transfer protocol (http). But these devices have constrained computational resources like RAM and processor speed. Due to constrained resources they cannot able to communicate using http. So they require special communication protocols like CoAP, MQTT and AMQP. Various manufactures can build their products using their proprietary architectures and communication protocols, when they try to communicate problems raised due to proprietary architectures and protocols. This is called interoperability problem. To solve this problem we propose a solution using Web of Things (WoT), WoT enables each and every device can connect to a server as web pages. So that we can access any device through web using internet as simple as we access web pages.

1. Introduction

Internet of Things (IoT) [8] enables every device (Thing) to communicate with each other through internet. Every device/thing has a sensor node which is capable of gathering data, processing and transferring to other nodes with the help of sensors, actuators and communication protocols. Different vendors manufacture variety of devices by using their proprietary architectures and communication protocols. Due to different architectures and communication protocols, devices cannot establish successful communication with other devices. ioT devices have less computational resources like Random Access Memory (RAM) and processor speeds. So they require special protocols at each layer. For instance, 6LowPAN being used at network layer, TCP/UDP at transport layer and COAP/MQTT at application layer.

IoT reference model uses CoAP, MQTT, AMQP, XMPP and DDS protocols at application layer to transfer messages among different devices as communication protocols. If a sender wants to send a message using CoAP protocol, receiver wants to receive using MQTT protocol then communication problem will be raised due to heterogeneity between sender and receiver protocols.

Web of Things (WoT) defines an established group of principles by the W3C consortium to solve the interoperability problems of various IoT (Internet of Things) applications at different levels. Web of Things enables every physical thing to be added to a server. So that it can be accessed from

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Detection of Military Targets from Satellite Images using Deep Convolutional Neural Networks

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Abstract*—Due to the varying size, orientation, and background of images in the defense sector, it is a daunting task to discern and distinguish the military targets in them. Multitudes of solutions have been proposed in this arena, yet there is a significant need for much better and flawless outputs. In this chapter, we expound on a two-level solution –Edge Boxes and Convolutional Neural Network (CNN) for the detection of targets in satellite imagery, Super resolution of the image using Dense-skip-connections. In the first level, the military objects are detected from the satellite image using Edge Boxes. In satellite imagery, the edge data of targets contains very prominent and concise attributes. The traditionally engineered features such as Histogram of Oriented Gradients, Hough transform and Gabor feature do not work well for huge datasets. However, the Edge Boxes technique generates contours around the target objects and discards the remaining. The output of this level is fed to the second level, wherein, the proposed targets undergo image super resolution. The presented deep learning model tends to inherently learn an end-to-end mapping between images of lower resolution and higher resolution. This level can be portrayed as one which takes a low-resolution input image and constructs an up-sampled high-resolution image as the output. Unlike traditional methods (sparse coding based method, bicubic method) that handle each component separately, this method aims to optimize all the layers at once. Furthermore, for assuaging the vanishing gradient problem that is common to very deep networks, Dense-skip-connections are employed. These enable the building of shorter paths directly within multiple layers. Though the proposed model has a light weighted structure, it exhibits state-of-the-art restoration quality.

Keywords— Super resolution of image, Dense-skip-connections, EdgeBoxes, Deep CNN, HOG, Gabor feature, Hough transform.

I. INTRODUCTION

Detection of target patches such as aircraft, tankers, artillery, etc. in satellite images is extremely important in military applications like surveillance and security where these applications require accurate identification and tracking of vehicles. Due to these intricacies, it has become an active research topic in computer vision. Because of different size, orientation and background of the target object, it often becomes a significant challenge to detect the military vehicles and differentiate them from non-military vehicles. Identifying individual target patches from the image would be difficult and the results might be ambiguous due to the size and resolution of the image. Hence, it becomes important to super-resolved the image to get better results. Diverse fields like medical image processing, remote sensing pose in numerous technically challenging use cases that make it necessary to achieve super resolution imaging. For image classification, convolutional neural networks have become state-of-the-art models and are regarded as one of the potential solutions for image super- resolution. Recently, convolutional neural networks classify objects with many clear or slightly blurred images with around 90 percent classification rates, even if there are variable-sized images [1]. Usually, large datasets are required for training. In this chapter, we address vehicle identification and recognition for imaging in defense applications. We propose the use of EdgeBoxes algorithm for extracting individual aircraft patches from the satellite image and a deep CNN model using dense skip connections for image super-resolution of the aforementioned patches.

II. RELATED WORKS

Satellite imagery has a very high significance in military applications. Various techniques and features have been proposed to date for automatic target detection in satellite imagery. There are several traditionally engineered models such as Histogram of oriented gradients, Hough transform, Gabor feature, etc. They tend to produce inaccurate results for huge data of low resolution. Computationally efficient and robust systems are required that can learn presentations from massive satellite imagery. Zhang et al [2] developed a hierarchical algorithm based upon the Adaboost classifier. This approach entails the use of HOG and Depth-First-Search (DFS) to detect the targets.

Another hierarchical classification algorithm is proposed by J.W Hsieh et al in [3]. This approach includes several image pre-processing techniques to remove the variations in the input image. It then employs a booting algorithm and uses the area feature to identify the targets.

[4] Proposes a method based on graph search strategy and improved Hough Transform for the detection of oil tanks in satellite imagery. In [17] symmetric properties of oil tanks are leveraged for their detection. In [5] Gabor filter was

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Poisson and Logistics Regression Analysis on Electromagnetic Field Radiation: A Case of Environmental Pollution

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Poisson and Logistics Regression Analysis on Electromagnetic Field Radiation: A Case of Environmental Pollution in Healthcare

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Abstract

The universal study reveals that Electromagnetic Frequency (EMF) exposure is upsetting the environment. It focuses keenly on the people residing in the neighboring of the base stations / mobile towers were affected by environmental radiation pollution. The effect of EMF radiation on human life is unusually increasing on day-to-day basis. As the number of customers using mobiles rises, one would see the mobile phone towers / base trans-receiver station (BTS) increases; and this has a great and huge impact on radiation hazards. Mobile phones have the capability of emitting radiations that would affect human tissues and it runs a two-way communication paradigm. Radio Frequency (RF) wave establishes communication around the globe in the mobile network. However, the radiations emitted by RF waves are harmful if absorbed into the human tissues. The most side effects experienced when nearer to these towers are headaches, discomfort, anxiety and other diseases. The radiation hazards are found to be extraordinarily more where the cell towers were installed nearer to educational institutes, healthcare and few residential areas. They were recommended to move / stay away from such areas, the radiations can cause tumors, disturbance of the nervous system and other diseases. The study is to understand the radiation exposure limits that would protect the public health from the EMF exposure. RF radiations were mapped by geographic information system (GIS) based measuring approach that helps in detecting places where users are in health hazards in exposed areas. This helps government and health organization to estimate the distribution of radiation in areas nearer to the location of mobile towers. Realization among the people was made to live and spend less time based on the radiation levels of exposure with the mobile towers. The analysis was carried out by STATA software to measure the poisson exposure of confidence interval. The poisson regression calculated for the mobile towers is 47473.38 and -0.00001 for Andhra Pradesh state respectively. Similarly, the poisson exposure is 19.2096 and CI is found to be 0.0013 to 0.2900 in Telangana state of India.

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Keywords: Poisson Regression, Logistics Regression, Geographical Information System, Electro Magnetic Field, Radiation, Mobile Towers.

Introduction

The mobility location-based service includes three components, namely Geographic Information System (GIS) technology, position tracking, and visualization. Two ever reliable techniques for identifying and locating various EMF radiation sources are Global Positioning System (GPS) and GIS. GIS-based approach is that which a user utilizes and mobile tower locations to detect the exposure area. The factors that influenced the exposure level includes the frequency of the radiation,

Emotion Analysis in Text using TF-IDF

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***Abstract*—A myriad of the population has adapted to the evolving technology, which includes text communication. Users advertently or inadvertently share emotions. As we know, emotions are one of the most critical aspects of human life; they impact human's behavior, thinking, compelling of action, and most important, decision making. There are many alleged emotions known to us, and each having its significance. In this era of modern technology, it is hard to find any unexplored area; this applies to emotion. People express their emotions through text a lot nowadays, which has led the Emotion Recognition as an important research area. Extracting emotion is a very complicated task. This paper shows a new approach to detect emotion based on TFIDF, and it is a measure that reflects the value a word holds in a document. In this method, emotion is classified into six types. There are other researches on the simple distinction between positive and negative emotion, but this does not add much to understanding human emotion. Emotion is extracted from different sentences, and data representation is based on semantic structure. It generalizes each sentence into six major predefined emotion sets. The evaluation shows that this method is well accomplished to categorize a sentence into different emotion categories and with a reasonable accuracy rate.**

Keywords—TF-IDF, Random Forest Classifier, Emotion Recognition

I. INTRODUCTION

The process of identifying human emotion is known as emotion recognition. It is vital for the human to human communication in daily life. People often use social media applications to share their emotions and feelings with others. Recognizing an emotion has always been a major challenge both for humans as well as machines. Often it is found that people may fail to recognize their own emotions at a certain instance. Ekman [1] classified emotions into six types: anger, fear, disgust, joy, surprise, sadness. Earlier, people used to express themselves using face to face interaction, but now most people have started using technologies to express themselves. These include the emergence of social media applications. Artificial Intelligence has always been tireless towards solving human problems and also understanding them better. Eventually, AI is pushing boundaries to obtain what is possible and efficient than ever before, so it has entered emotion analysis. Hopefully, this paper can be a minuscule contribution to this vast field of Artificial Intelligence.

Emotion detection [2] plays a key role in human-computer interaction. People express their emotions through speech, facial, and text. Much research has been done concerning facial recognition and speech recognition, but identifying a person's emotional state on looking at a person's face is missing key information. Emotions depend not only on facial expression but also on the present situation, whereas in speech recognition, the feature extraction is often complex as it consists of several acoustic time-based characteristics like amplitude, frequency, and formant.

On the contrary, emotion recognition in the text is playing a promising role in the field of AI. The primary reason behind this is the availability of an immense amount of data. An analysis done by Slick Text [3] shows that 80% of North America's total population prefers text-based communication. Text-based emotion recognition has a variety of applications. For example, suicidal prevention and depression applications detect the emotion present in the user's text. Another area where emotion detection can be used is in the recommendation system by improving a customer's perception to increase brand reputation. The government can also use it to gauge how happy its citizens are, which can be considerable input for the happiness index.

This paper aims to propose an efficient solution to the existing emotion analysis method. Furthermore, to study the problem in-depth and suggest an alternate algorithm that is logical and tends to obtain good accuracy. A dataset that consists of a set of sentences, and its corresponding emotion has been chosen. This dataset is then subjected to an algorithm that helps the machine to understand the relation between the sentence and the emotion-based on specific terms. On successful implementation of the algorithm on the dataset, emotion recognition rules are generalized. For example, consider the sentence "This is the first time I won the competition" to depict the emotion "happy." This model is tested on many sentences similar to this sentence and achieved an F score of 85%.

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Diabetic Retinopathy Classification Using Lightweight CNN Model

Morarjee Kolla & T. Venugopal

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Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 828)

Abstract

Diabetic Retinopathy (DR) is a dangerous disease nowadays, which may cause vision loss. Current deep learning models are successful in classifying different stages of DR effectively. Still, there is a memory bottleneck to deploy these models into mobile-like devices. The computational cost of existing deep learning models needs to reduce for commercial medical applications. Existing lightweight models facing challenges with parameter reduction, minimizing quantization loss, and gradient error. To combat these challenges, we proposed a lightweight

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FUEL OIL FROM PLASTIC WASTE.

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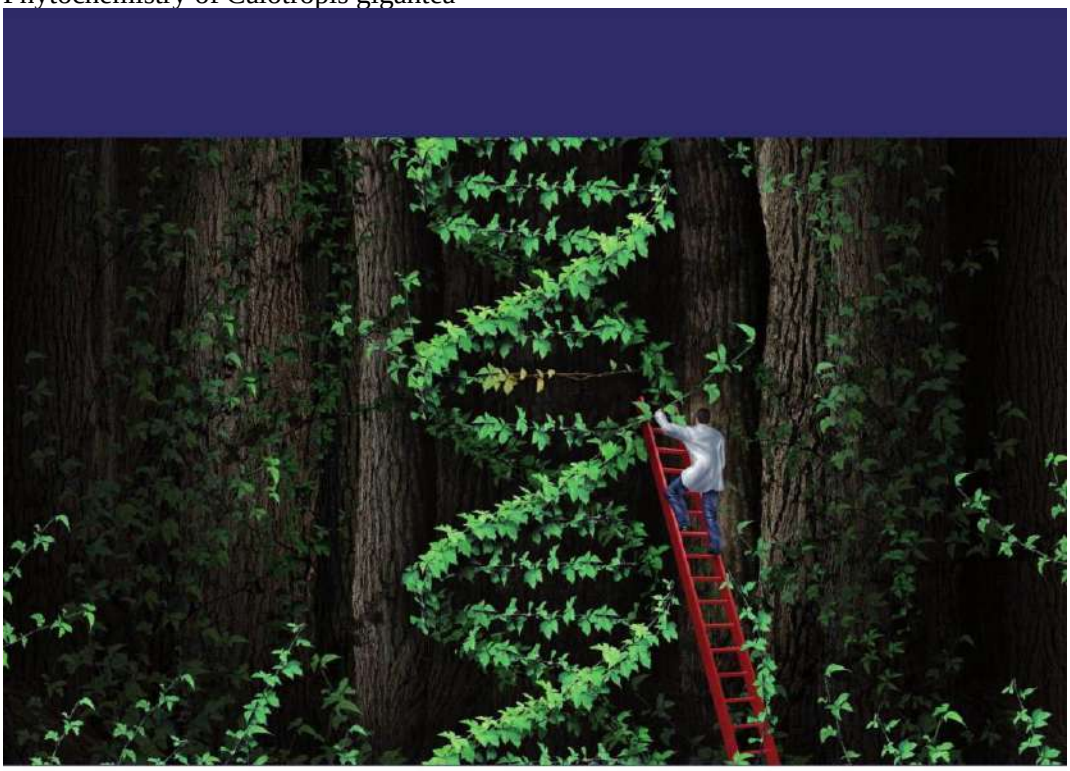
Abstract:

In Earlier days PLASTIC was a revolutionary invention which brought many changes in industrial & daily activities. But now a days, it has become a major problem as it is increasing the landfills which is leading to more pollution because of its high degradation time and no proper disposable way which is affecting the environment. The global production of plastic has shown an increase from around 1.3 MT in 1950 to 300 MT in 2010 due to the introduction of plastic in various fields. Out of the total consumption of plastic,53 % constitute polyolefins which is a large hydrocarbon. Polyethene is most consumed one i.e. 33% of total due to this it is taken into consideration.

To overcome this problem, we used Thermal Cracking i.e. Pyrolysis, it is a process which converts the large hydrocarbon chains in to small hydrocarbon chains by heating the plastic at high temperature (350 – 400°C) & the products obtained are fuel oil and non- condensable fractions. The fuel oil can be used for heating purposes and non-condensable fractions to reduce air pollution. Polythene, Polypropylene are used as they are pure hydro-carbons and burnt completely.

Key words: Alternative fuels, GCMS, CHNS and HDPE.

Phytochemistry of Calotropis gigantea



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Phytochemistry of CALOTROPIS gigantea

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In the present era, there are rapid advancements in the fields of medical and pharmaceutical sciences.Even though there is a rapid advancement, equally there is emergence of new diseases caused by different microbial organisms.Extensive use of the existing drugs leads to emergence of antibiotic resistance pathogens.There were several reports that the pathogenic bacteria were evolving and becoming resistant to the drugs over the time. Pathogenic organisms cause many infections in human beings such as pulmonary, respiratory, cutaneous, nosocomial and several other communicable infections.Majority of the times, we observe these infections in immune deficient patients who are sensitive and more likely to be affected by these pathogens. Chemically synthesized drugs are very effective against the infectious diseases but, on the other hand, they are found to have many side effects.Therefore, there is a need to look for alternative drugs for the chemical drugs.Plants serve as major sources of potential drugs. They are bio compatible and have no side effects.Plants produce secondary also called as phytochemicals. Calotropis gigantea is one of such plant which possess medicinal properties..

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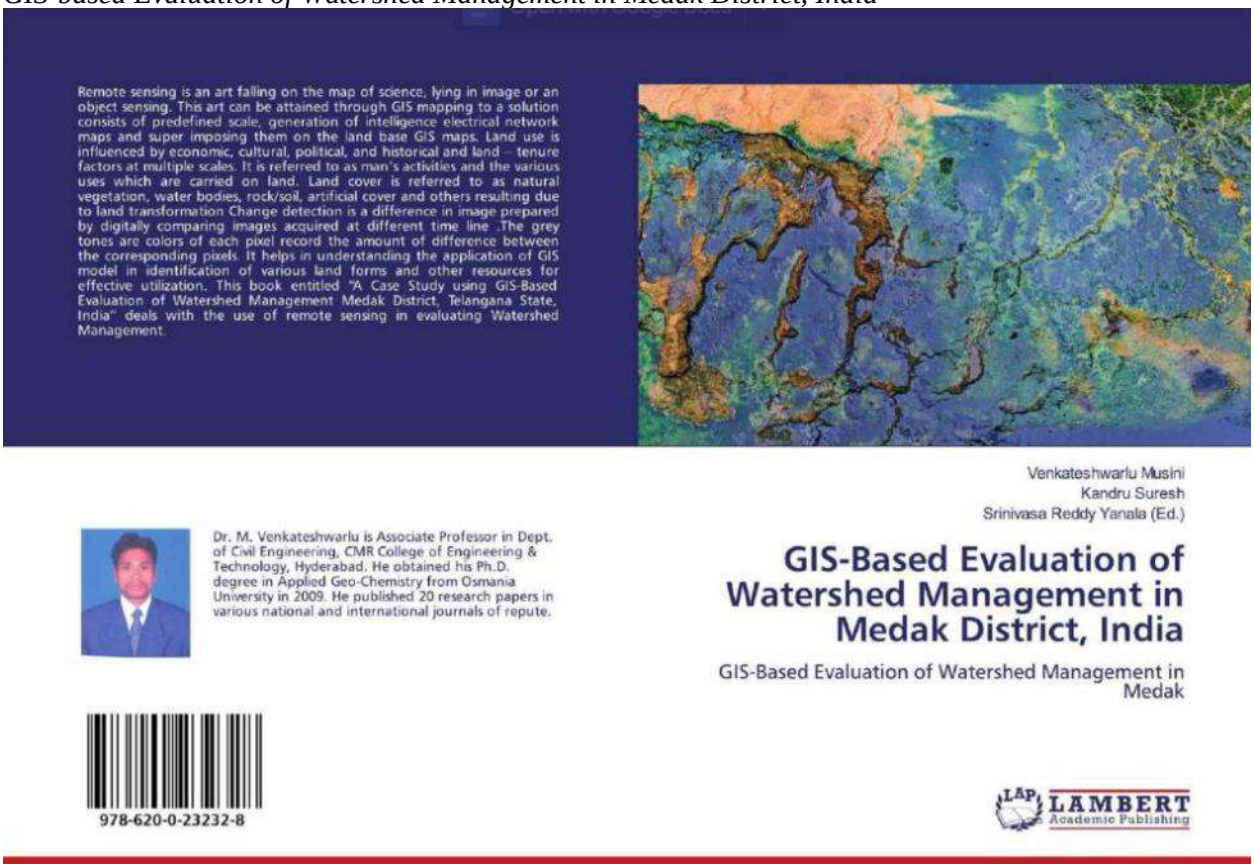

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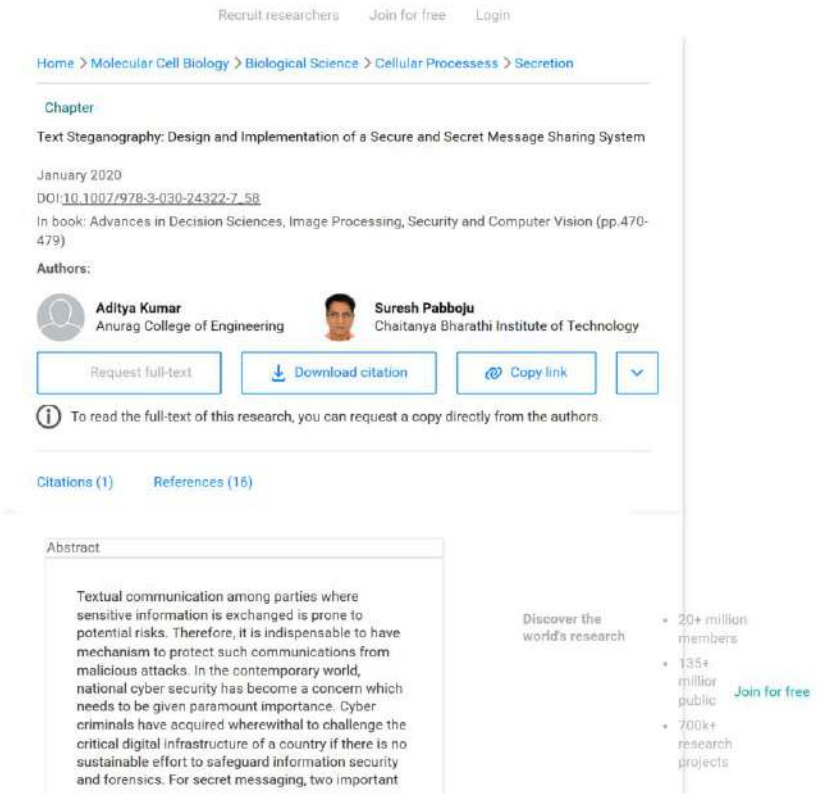

Real Time Aspect based sentiment analysis on consumer reviews

Data Engineering and Communication Technology pp 801–810

Real-Time Aspect-Based Sentiment Analysis on Consumer Reviews

Jitendra Kalyan Prathi, Pranith Kumar Raparthi & M. Venu Gopalachari

Conference paper | First Online: 09 January 2020

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Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 1079)

Abstract

The rise of e-commerce websites, as new shopping channels, led to an upsurge of review sites for a wide range of services and products. This provides an opportunity to use aspect-based sentiment analysis and mine opinions expressed from text which can help consumers decide what to

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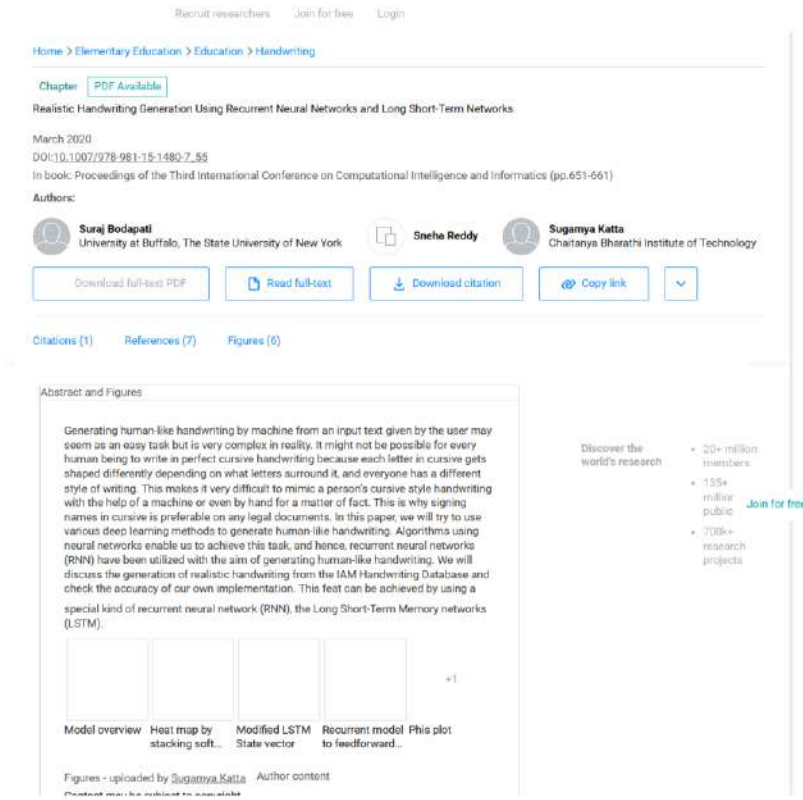


Rough Set-Based Classification of Audio Data

Proceedings of the Third International Conference on Computational Intelligence and Informatics pp 627–637

Rough Set-Based Classification of Audio Data

T. Prathima, A. Govardhan & Y. Ramadevi

Conference paper | First Online: 18 March 2020

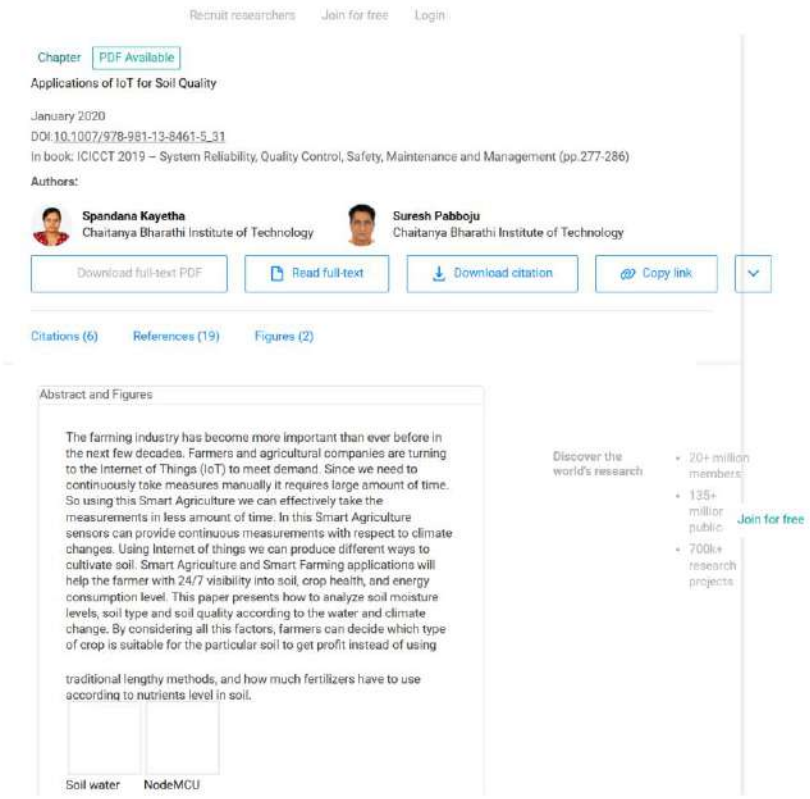
477 Accesses

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 1090)

Abstract

For effective multimedia content, retrieval audio data plays an important role. Recognising classes of audio data which is neither music nor speech is a challenging task; in this aspect, the authors proposed to work on environment sounds. To represent the audio data, low-level features are extracted. These low-level descriptors are computed from both time domain and frequency

Applications of IoT for Soil Quality. In: System Reliability, Quality Control, Safety, Maintenance and Management.



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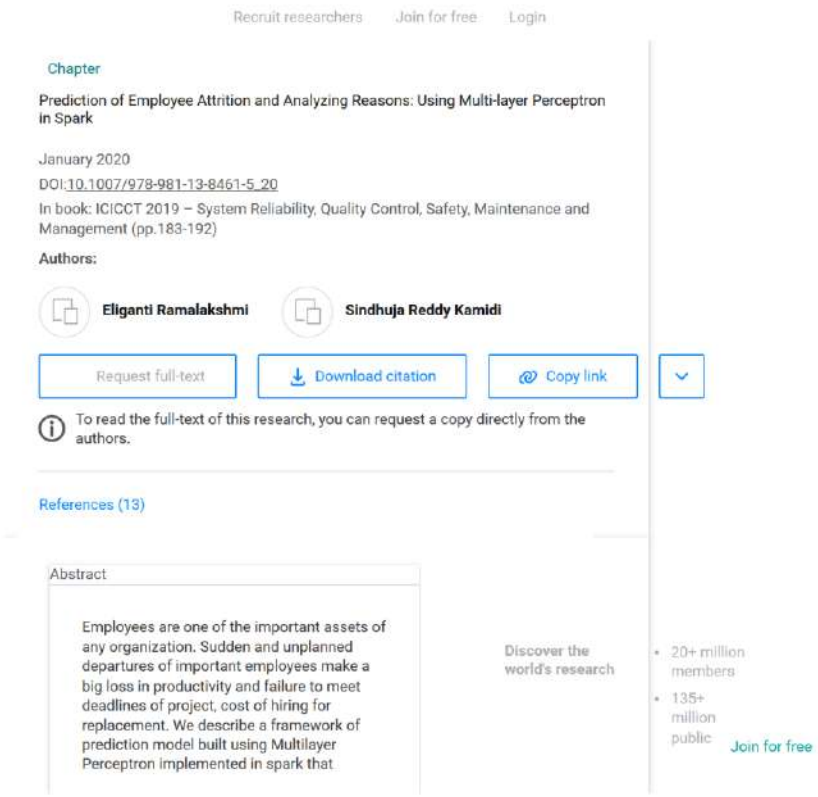

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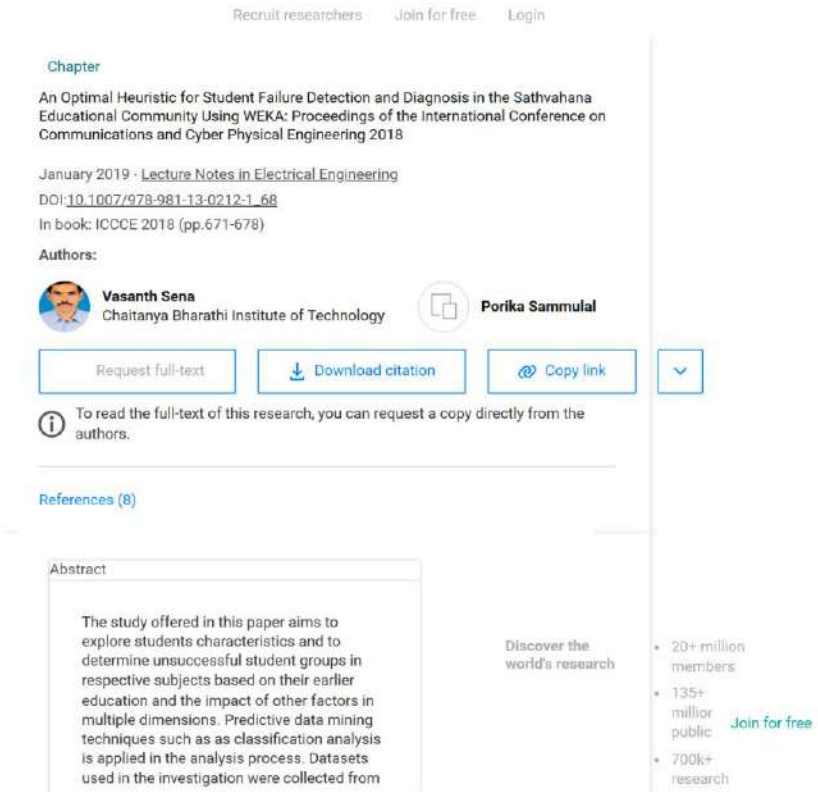

An approach to mine time interval based weighted sequential patterns in sequence databases

Hexagonal image processing and transformations: A practical approach using R

Cognitive Science and Artificial Intelligence pp 91–99

Hexagonal Image Processing and Transformations: A Practical Approach Using R

E. Ramalakshmi & Neeharika Kompala

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Abstract

Hexagonal structure is remarkable in connection to the standard square structure for picture depiction. The geometrical course of action of pixels on hexagonal structure can be portrayed similar to a hexagonal system. Hexagonal structure gives a straightforward way to deal with picture translation and turn information. Winding Architecture is a reasonably new and competent approach to manage machine vision structure. Regardless, all the present hardware for finding picture and for indicating picture are made in light of rectangular building. It has transformed into a noteworthy issue impacting the pushed research on Spiral Architecture. In this

DYNAMIC PHONE WARPING – A METHOD TO MEASURE THE DISTANCE BETWEEN PRONUNCIATIONS

Akella Amarendra Babu[1], and Ramadevi Yellasiri[2]

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ABSTRACT

Human beings generate different speech waveforms while speaking the same word at different times. Also, different human beings have different accents and generate significantly varying speech waveforms for the same word. There is a need to measure the distances between various words which facilitate preparation of pronunciation dictionaries. A new algorithm called Dynamic Phone Warping (DPW) is presented in this paper. It uses dynamic programming technique for global alignment and shortest distance measurements. The DPW algorithm can be used to enhance the pronunciation dictionaries of the well-known languages like English or to build pronunciation dictionaries to the less known sparse languages. The precision measurement experiments show 88.9% accuracy.

KEYWORDS

Natural Language processing, word distance measurements, pronunciation dictionaries.

1. INTRODUCTION

Pronunciation dictionaries are not available for all languages and the accents of various regions. This paper aims to build online pronunciation dictionaries using sound distance measurements. Human beings hear a word; compare it with the words in the memory and select the word which highest similarity to the input word. The objective of this paper is to follow the technique adopted by the human beings and prepare the pronunciation dictionaries. The primary focus of this paper is to measure distances between and sounds and to use this data to measure the distances between the words.

The reasons for the pronunciation variability are as under:

1.1 Speaker's Accent: The accent of the speaker depends on his mother tongue [1, 2]. The difference is negligible in respect of the speakers of the same country. But the difference is glaring in respect of foreign speakers.

1.2 Speaker's Emotions: The pronunciation of the same word would be different when spoken with different emotions like joy, love, anger, sadness and shame [3, 4].

1.3 Speaking Style: The speaker style varies when speaking to various people. The same name is spoken with different pronunciation while addressing an office peon and while addressing your friend.

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Automatic Framework of Music Ringtone Extraction from Tollywood Songs

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AUTOMATIC FRAMEWORK OF MUSIC RINGTONE EXTRACTION FROM TOLLYWOOD SONGS

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Abstract: An automatic framework is used to extract the ringtones from music automatically. In this, song is considered as the grouping of segments of music such as intro, chorus, verse, bridge, outro. Mostly the ringtone will be the 'chorus' or 'intro' segments of music. The process of manually checking each song and cropping specific parts of the song is a tedious process. Western music and Bollywood songs are widely used for ringtone extraction. The accuracy is not stable for different genres of the songs such as hip-hop, ghazal etc work, for automatic extraction of ringtone, beat tracking is done by using Simon Dixon BeatRoot followed by feature extraction process as the audio data lies within beats. Songs from Tollywood (regional) were used for experimentation. SVM and Naïve Bayes classifiers are used for comparisons. The class labels are predicted based on training samples. The accuracy gained by SVM is 62.9% with 11093 beat data and the Naïve Bayes classifier gained 75% accuracy with the same beat data. In the two datasets of experimentation Naïve Bayes performed better than SVM.

Index Terms - BeatRoot, Feature Extraction, Classification, Segment Boundary Detection.

I. Introduction

Automatic music extraction is very useful in significant fields. In this a song is taken as input and divided into segments which are considered as meaningful regions such as verse or chorus. The structure of song is usually divided into intro, verse, chorus, outro, etc. Ringtone is an audio file played on mobile phones to indicate an incoming call. Ringtones are popular because in a crowd of people with cellular handsets it is easy to identify easy whose phone is ringing.

Ringtones and ring-music bring more fun when people make calls and it remains as labor intensive work, people need to listen each and every song to set the starting point and ending point for a clip with in audio file, then extract the segment [1]. In this paper our main goal is to extract the ringtone automatically by detecting the boundaries of segments correctly with good accuracy.

Song forms are made up of a number of sections that may or may not be repeated within the same song. Some of the popular song structures are strophic (AAA) form, AAB (12 bar blues) form, AABA song form, AB or verse/chorus song form, ABC song form or verse/chorus/bridge song form. South Indian music song forms are very similar to western music forms.

A. Genres of Telugu songs

In music genre refers to musical style. Some of the popular genres of Indian music are [2]:

- Classical: The composition of classical music is based on ragas, which are the scales of seven basic notes such as sa, re, ga, ma, pa, dha and ni. The commonly played musical instruments of this genre includes sitar, surbahar, sarod, sarangi, santoor, bansuri, pakhavaj and tabla.
- Ghazal: According to Arabic dictionary the word ghazal means 'talking about woman', it is generally a poem consisting of five to fifteen couplets known as 'shers'. The ghazals became a part of the Indian music with the invasion of Mughals.
- Pop- Indipop music is a hybrid of Indian and western musical traditions.
- Devotional: Bhakti or devotion, constitutes an important part of Hindu religious practice. The broad sweep of devotional music includes chants and readings of scriptures such as the Vishwasahasranam, Shivamahimmah stotra, Bhagavad Gita and holy mantras, such as Om Namah Shivaya.
- Folk: India folk music owes its origins to the villages, which represents the folklore and lives of the villagers
- Tribal: Indian tribal music is originated from the inhabitants of the hilly regions and they are composed among the tribals of northeast India and southern states.

Folk and tribal music was composed and performed in order to celebrate a particular festival or to deliver a message.

B. Structure of Indian song

A Wavelet Based Digital Image Watermarking for Broadcast Monitoring using Genetic Algorithm

6th International Conference on Advanced Computing, Networking, and Informatics

(ICACNI 2018)

CERTIFICATE

This is to certify that ***Sridevi Tumula and Rahul Chandra Nagu*** *authored a paper titled* ***'A Wavelet Based Digital Image Watermarking for Broadcast Monitoring using Genetic Algorithm'*** *in the 6th International Conference on Advanced Computing, Networking, and Informatics (ICACNI 2018) held during 04 - 06 June 2018 co-organized by Department of Computer Science & Engineering, National Institute of Technology Silchar and Centre for Computer Vision and Pattern Recognition, National Institute of Technology Rourkela.*

Shyamosree Pal

Shyamosree Pal

Ripon Patgiri

Suitability of Ionospheric Coefficients for IRNSS Single Frequency Receivers

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***Abstract*— For single frequency navigation receiver, there are various techniques to estimate the ionospheric delay. Klobuchar model is a standard technique for single frequency signal that is used to estimate the ionospheric delay globally. It uses two sets of ionospheric coefficients, namely, alpha and beta, to compute the ionospheric delay. There are two different ionospheric model coefficients for IRNSS and GPS. This paper compares the estimation of ionospheric delay using single frequency (two sets of ionospheric model coefficients) and dual frequency signals. The dual frequency estimation is used to validate the results due to Klobuchar model. The ionospheric delays due to GPS ionospheric coefficients are found more suitable than the delays due to IRNSS ionospheric coefficients.**

***Keywords*—GPS, IRNSS, Klobuchar Model, etc.**

I. Introduction

Indian Regional Navigation Satellite System (IRNSS), now termed as Navigation with Indian Constellation (NavIC) is an autonomous system developed by Indian Space Research Organisation, Govt. of India. It provides signals in two frequency bands, namely, L5 band and S1 band. The propagation of these signals is effected by various errors. One prominent error, namely, ionospheric error, delay the travel time of the signals. Ionospheric delay can be estimated using single frequency and dual frequency signals [1-3]. For single frequency receivers, in particular for civil aviation, ionospheric time delay degrades the positional accuracy. Approximately 50% of the ionospheric time delay can be reduced by the Klobuchar model (1987) that uses two sets of coefficient. In this paper, Ionospheric delay is estimated using ionospheric coefficients provided by navigation files of GPS and IRNSS. Also, to validate the results more precise estimation of ionospheric delay is required. Hence, ionospheric delay using dual frequency is also estimated.

II. Data Acquisition

Under an MoU between Chaitanya Bharathi Institute of Technology (CBIT) and Space Applications Centre (SAC), ISRO two Accord made IRNSS receivers are installed at CBIT, Hyderabad. Extensive research work and several experiments are carried out. Data is continuously acquired, stored and shared with SAC periodically. This paper uses Receiver Independent Exchange (RINEX) and Comma Separated Value (CSV) data provided by the receiver. The CSV data provided by the receiver is termed as IRNSS Receiver Software (IRS).

III. Methodology

The navigation message of the GPS and IRNSS contains ionospheric Alpha and Beta coefficients. Klobuchar model use these coefficients with Elevation and Azimuth angle between the user and satellite [4]. The vertical ionospheric time delay (T_{Id}) is given as,

$$T_{Id} = f * \left[5 \times 10^{-9} + \sum_{n=0}^{3} \alpha_n \emptyset_m^n \times \left(1 - \frac{x^2}{2} + \frac{x^4}{24}\right)\right] \quad (1)$$

where

$$x = \frac{2\pi(t - 50400)}{\sum_{n=0}^{3} \beta_n \emptyset_m^n}$$

α and β — Ionospheric coefficients from navigation file
$\emptyset_m^n$ — Geomagnetic latitude (semi-circles)
f — Slant factor

As the delay due to GPS coefficients are for L1 frequency, the calculated delay is converted for L5 frequency using a correction factor of 1.7934. Klobuchar model provides vertical ionospheric delay, hence, it is converted to slant ionospheric delay. To estimate the slant ionospheric delay, the vertical delay is to be multiplied with a standard mapping function. The most commonly used Mapping Function (MF) to calculate slant ionospheric delay is given as [5],

$$MF = \left(1 - \left(\frac{R_e \times \cos(el)}{R_e + h_{ION}}\right)^2\right)^{-\frac{1}{2}} \quad (2)$$

Where R_e is the earth radius (6,371 km), el is the elevation angle between user and satellite and h_{ION} is the ionospheric thin shell height considered as 350 Km in this analysis.

The ionospheric delay is directly provided by the IRS software. Apart from this, code measurements are used to estimate the ionospheric delay using dual frequency data. Ionospheric delay is given as

$$I_f = \frac{40.3}{f^2} \times TEC \quad \text{(m)} \quad (3)$$

where, f is frequency (Hz), TEC is Total Electron Content (el/m^2).

Total Electron Content (TEC) is defined as the total number of electrons a signal experience with a cross sectional area of 1 m^2. TEC due to code measurements is given as [3,6],

$$TEC_C = 4.4192 \times (P_1 - P_2) \quad \text{[TECU]} \quad (4)$$

where, P_1 and P_2 are the pseudoranges from S1 and L5 frequency respectively.

IV. Results and Discussion

Several days of data has been analysed, but, for convenience results due to only two typical days (21st July and 30th July 2018) are shown. Estimation of ionospheric delay for 21st July and 30th July 2018 are shown in Fig. 1 and 2 respectively. Two results are due to Klobuchar model and

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Analysis of Ionospheric Delay Effects on IRNSS-GPS Receiver Coordinates

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***Abstract*— The ionosphere is one of the major error sources in today's GNSS receivers for accurate position estimation. The signals from the satellites experience delay when propagating through the ionosphere resulting in error in position estimation. Various models and mathematical formulations have been developed to estimate the range error due to ionospheric delay. This paper investigates the effect of ionospheric delay on IG (IRNSS-GPS) receiver position coordinates (x, y and z). The position error and standard deviation of each coordinates is estimated. Also, 2D (x and y coordinates) position accuracy of IG receiver is estimated by using CEP, DRMS and 2DRMS. It is observed that, y coordinate is more effected and this aspect may be useful in analyzing the timing accuracy estimation.**

Keywords—IRNSS-GPS, ionospheric delay, CEP, DRMS and 2DRMS

I. INTRODUCTION

Indian Regional Navigation Satellite System (IRNSS) is an indegineous regional navigation system, developed and controlled by Indian Space Research Organization (ISRO). It operates both in L5 and S1 band of frequencies. The IRNSS receiver consists of 7 satellites (3 GEO and 4 GSO) namely IRNSS-1B, 1C, 1D, 1E, 1F,1G and 1L

. Ionosphere is one of the prominent sources of error in satellite navigation resulting in error in the xyz components and the position estimation consequently[1]. Several reseachers presented 2D position accuracy in the context of GPS [2-4]. Similar work is done on comparative analysis of single and dual frequency of ionopheric delay effects on user position accuracy in the context of GPS [5]. Recently, siginificant work is done on the performance evalution of IRNSS-GPS-SBAS receiver in terms of position and accuracy [6]

II.THEORITICAL BACKGROUND

The geodetic coordinates of GNSS receiver can be (latitude, longitude and altitude) converted to Cartesian coordinate (x, y and z) components as follows [7]

$$x = (n + h)\cos(\phi)\cos(\lambda) \quad (1)$$

$$y = (n + h)\cos(\phi)\sin(\lambda) \quad (2)$$

$$z = [(1 - e^2)n + h]\sin(\phi) \quad (3)$$

Where ϕ is latitude (deg.), λ is longitude (deg.), n is radius of curvature of the earth (meters), h is ellipsoidal height (meters) and e is the eccentricity of ellipsoid, a and b are semi-major and semi-minor axes of the ellipsoid, O_P and I_P are the points outside and on the surface of the ellipsoid respectively (Fig.1). From the equations (1, 2 and 3), it is evident that the variation in x and z coordinates is minimum at low latitude and high longitude angles for a given eccentricity, ellipsoidal height and radius of curvature of the earth. Whereas, the variation in y coordinate is maximum for low latitude and high longitude angles. In the paper, we did analysis for a low latitude and high longitude station, Hyderabad (17.3921° N, 78.3195° E). We also simulated and verified that, variation in y-axis is more than in x-axis and z (Fig. 2)

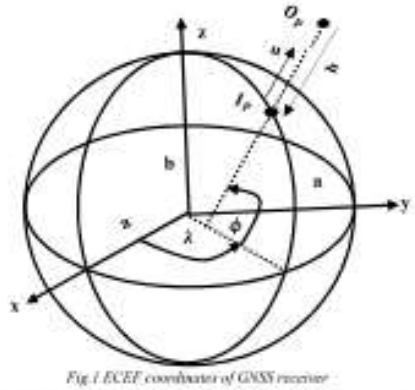

Fig.1 ECEF coordinates of GNSS receiver

The 2D position accuracy is measured in IGS (IRNSS+GPS+SBAS) receiver from the scatter plot using Circular Error Prabability (CEP). The receiver logged the positions over period of a time, positions are spread over an area due to measurement errors called scatter plot. The GNSS receiver designers used various methods like CEP, Distance Root Mean Square (DRMS) and 2DRMS to characterize the position accuracy. The CEP is described as the radius of a circle with true position as the center, which contains the propability of 50% error values with in circle, given by [8]

$$CEP = 0.56\sqrt{\sigma_x^2} + 0.62\sqrt{\sigma_y^2} \quad (4)$$

Where σ_x and σ_y are stadard deviation of x and y coordinates respectively.

In order to characterize the 2D position accury by using DRMS, first need to estimate the standared deviation of position coordinates (x and y). The DRMS is defined as squre root of sum of squares of stadard deviation of x and y position coordinates. The DRMS circle contains the probability of 65% error values with in the circle, is expressed as

$$DRMS = \sqrt{\sigma_x^2 + \sigma_y^2} \quad (5)$$

Similarly, 2DRMS is defined as twice the value of DRMS. The 2DRMS circle contains the probability of 95% error values with in the circle ,is given by

$$2DRMS = 2 * \sqrt{\sigma_x^2 + \sigma_y^2} \quad (6)$$

These parameters are most commonly used position accuracy measures for GNSS receivers

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Sierpinski Monopole Antenna Reconfigurable System using Hairpin Bandpass Filter Sections

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***Abstract*— In this paper, the design and development of a Sierpinski monopole gasket antenna reconfigurable system cascaded with two hairpin bandpass filter sections is presented. The reconfigurability is achieved by incorporating PIN diode switching mechanism to select the appropriate filter section to resonate the antenna at a desired frequency of interest. The proposed structure is aimed to be operated at 3.5 GHz and 7.5 GHz with good amount of gain, bandwidth along with the reduction of interference at the receiver. The proposed model is verified using the commercially available simulating software CST Microwave suite and a prototype is fabricated and tested accordingly. The simulated results are compared with the measured values and the corresponding results are presented. The simulated results shows that the antenna is resonating at 3.5 GHz and 7.5 GHz for a measured values of 3.48 GHz and 7.5 GHz with the appropriate selection of the switching mechanism. The antenna demonstrates a gain of 9.8 dBi and 6.2 dBi when simulated corresponding to a measured values of 10.1 dBi and 7.1 dBi respectively. The antenna offers a bandwidth of 60 MHz and 100 MHZ when simulated and 50 MHz and 180 MHz after the practical measurement at the operational frequencies. Nearly a 26 dB of separation of measured power levels between the operating frequencies can be observed at the receiver. The structure is better suitable for the Cognitive Radio applications as it offers better values of gain, bandwidth and reduced interference levels at the receiver along with design flexibility.**

Keywords*—Sierpinski Monopole Gasket, Hairpin Bandpass Filter, PIN diodes, Reconfigurability, Interference, Gain, Bandwidth, Cognitive Radio

I. Introduction

The growing demand for the wireless connectivity has necessitated a new communication technique to exploit the usage of electromagnetic spectrum in an efficient way. The Cognitive Radio (CR), a prominent technology is intended for the effective utilization of the spectrum in a systematic approach either by using spectrum underlay or spectrum overlay approach [1]. The most important task in this perspective is the design of an antenna that must be capable of adapting the changes in the environment accordingly. Therefore, the antenna systems should be reconfigurable to cater the needs of the CR framework [2]. The microstrip antennas are considered to be the suitable structures for achieving these performance characteristics owing to their advantages of being compact, lesser in weight, ease of integration with feeding mechanism. At the same time, they have the disadvantage that, they offer lesser values of gain and bandwidth. The fractal antennas are considered to be the suitable components in the design of a reconfigurable antenna system. The Sierpinski gasket fractal antennas [3] in particular, allow the design of dynamic structures to obtain the frequency reconfigurability mechanism using suitable switching mechanism. This is due to the nature of their multi-band operational characteristics with reasonably good operational band width and systematic utilization of the spectrum for the efficient communication. Similarly, the monopole configuration offers more gain and band width when compared to dipole arrangement [4]. However, it is essential to note that maintaining the constant gain over the band in a reconfigurable antenna and reducing the interference between the operating frequencies at the receiver is a serious challenge when working at different resonant frequencies. These challenges can be solved by integrating appropriate antenna structures with reconfigurable filters [5]. In this context, the hairpin bandpass filters are considered to be the more appropriate structures for achieving good pass band characteristics as they are compact, simple in design, easy to fabricate at lower costs [6]. Moreover, they offer lesser coupling losses when compared to other coupled line filters and so on. Therefore, these two components can be cascaded together to select a particular resonant frequency by proper switching mechanism. Such arrangements will help to maintain uniform antenna surface current distribution over the structure at a particular frequency and avoids the alterations by tuning the filter components [7] due to which the antennas offer constant gain over a frequency range of interest. On the other hand, the noise performance of the overall system can be improved and interference is minimized effectively at the receiver end due to the independent operation at a given frequency. The frequency reconfigurability of these structures can be obtained by incorporating appropriate PIN diode switching circuitry [8] along with the cascaded hairpin band pass filters. The PIN diodes are also helpful in providing further isolation and to reduce the interference at the receiver. These systems are more dynamic, compact and can be designed easily with stable radiation characteristics, reasonably good values of gain and bandwidth. The similar kind of structures that are available in the literature [9] [10] could not provide the higher values of gain and bandwidth and they do suffer from the coupling losses and interference. Therefore, this paper aims to resolve the problems that are identified from the literature by adopting a different mechanism. The proposed antenna system consists of a sierpinski monopole gasket cascaded along with suitable hairpin bandpass filters operated by the appropriate PIN diode switching mechanism to obtain the reconfigurability. Even though, the Sierpinski monopole gasket can offer multi band operation, i.e at 1.75 GHz, 3.5 GHz, 7.5 GHz, 11 GHz, the proposed structure is designed to operate only at 3.5GHz and 7.5 GHz by using the proper switching mechanism considering the practicality of the design. The proposed model is verified by using commercially available CST microwave suite [11] and the results are compared with the measured values of fabricated prototype and a good agreement has been obtained.

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"Edge cut Dual-Band Slot Antenna for Bluetooth/WLAN and WiMAX Applications"

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Edge Cut Dual-Band Slot Antenna for Bluetooth/WLAN and WiMAX Applications

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Abstract

A novel edge cut dual-band microstrip slot antenna and dual-band slot antenna are presented. The presented antennas find applications in Bluetooth/WLAN and WiMAX. These antennas use microstrip feed; in dual-band slot antenna, the lower band is considered from about 2.38 to 2.42 GHz, and the upper band is considered 2.59–2.64 GHz, whereas edge cut dual-band slot antenna, the impedance bandwidth of lower band is 2.37–2.43 GHz and the impedance bandwidth of upper band is 2.71–2.76 GHz. For dual-band antenna, the center frequency for lower band is 2.4 GHz and for upper band is 2.61 GHz, whereas for edge cut dual-band slot antenna, center frequency for lower band is 2.4 GHz and for upper band is 2.73 GHz which is assumed. The antenna simulations are carried out using HFSS, and a comparison among simulation and measured results is presented in this paper.

Keywords

Edge cut Dual-band Slot antenna HFSS Microstrip antenna WLAN WiMAX

References

"Investigations of Doppler Collision Effects on NavIC"

Investigations of Doppler Collision Effects on NavIC

Publisher: IEEE Cite This PDF

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Abstract:
Doppler collision is a very important effect that will limit the performance of the satellite navigation systems. Therefore, there is a need to analyze the effect on NavIC (Navigation with Indian Constellation). NavIC is the emerging regional satellite navigation system designed and developed by Indian Space Research Organization, India. This system having seven IRNSS (Indian Regional Navigation Satellite System) satellite constellation consists of three geostationary satellites (IRNSS 1C, 1F and 1G) and four geosynchronous satellites. As the NavIC constellation uses the geostationary satellites, the effect of Doppler collision is more, even though they have orbital inclination angle of about ±5°. In this paper, the effect of Doppler collision for NavIC constellation is analyzed by considering three months data acquired from IGS (IRNSS-GPS-SBAS) receiver. It is found that Doppler collision occurs between IRNSS 1C and 1G is more comparatively IRNSS 1C and 1F & IRNSS 1F and 1G. The Doppler collision period occurs twice in a one sidereal day for all IRNSS geostationary satellites combination. For IRNSS 1C and 1G, the Doppler collision period is about 4 hrs 52 min i.e 18.8% of the one day time (24hrs). These results are useful for changing the inclination of geostationary satellites for avoiding Doppler collision which will improve positional accuracy.

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"Performance Evaluation of IRI-2016 Model Using IRNSS Data over a Low Latitude Station: Preliminary Results"

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Performance Evaluation of IRI-2016 Model Using IRNSS Data over a Low Latitude Station: Preliminary Results

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***Abstract*—The International Reference Ionosphere (IRI) model plays an important role in various applications and connected with communication, navigation and other fields. This paper discusses the performance of the latest version IRI-2016 model for estimating the vertical ionospheric delays during geomagnetic quiet (13th May 2017) and disturbed (20th May 2017) days over a low latitude station. The ionospheric delays obtained due to IRNSS L5 (1176.45MHz) signal at low latitude Hyderabad station (17.24° N; 78.31° E), are compared with the results of IRI-2016 model. The obtained results will be helpful in improving the performance of IRI-2016 model over low latitude regions.**

Keywords*— *Ionospheric delay, IRNSS, IRI and Low Latitude.

I. INTRODUCTION

The ionospheric propagation effects play a critical role on the performance of Communication, Navigation and Surveillance system applications. Precise estimation of Total Electron Content (TEC) would be very helpful in improving the system performance in both civilian aviation and defence applications. The low latitude ionospheric layer is highly dynamic in nature, due to several phenomena such as equatorial ionospheric anomaly (EIA) [1], which can result in variations of different ionospheric parameters such as TEC. These TEC variations affect communication and navigation fields to a great extent. Hence, to understand the ionospheric variations over low latitude regions, modeling of ionospheric time delay is necessary. Accordingly, ionospheric models can be classified as global, regional, and local for estimating ionospheric characteristics of a specific region at a specific latitude, longitude, altitude, time, and geomagnetic activity. The IRI model is one of the standard global models to predict the behavior of the ionospheric layer in terms of various parameters. The IRI model is based on the world wide data available not only from ground based but also from space based systems. In the recent past, several regional ionospheric models are investigated over the Indian region [2-3]. Various investigators observed significant fluctuations in ionospheric time delays over low-latitude regions during the geomagnetic storm days [4-5].

II. DESCRIPTION OF IRI-2016 MODEL AND IRNSS

In this section we described IRI-2016 model and IRNSS.

A. IRI-2016 model

The IRI model is a global ionospheric model and is developed by the Committee on Space Research (COSPAR) and the International Union of Radio Science (URSI). The IRI model is an empirical and data based model to predict the variations in ionospheric layer [6]. This can be used to estimate the values of ion temperature, ion composition, electron density, electron temperature, and VTEC (Vertical Total Electron Content) at altitudes ranging from approximately 50 to 2000 km. When new data and new techniques are available, model is being upgraded continuously. In 1978 the first version of IRI model was released [7]. Later this model was followed by several improved versions in 1986, 1990, 1995, 2001, 2012 and 2016. At present, IRI-2016 is the updated version of the model. The IRI model strongly depends on existing database and the regions which are not covered by database experience reduced reliability of the model. India is one such region and needs careful attention while using this model.

B. IRNSS

The IRNSS (Indian Regional Navigation Satellite System) is being developed by India. This system covers India over a range of 1,500 km beyond its borders with 7 satellites constellation. It can provide position accuracy within 10m over the Indian landmass and below 20m over the oceans. It is expected to provide better coverage area and improved accuracy with satellite constellation enhanced to 11 satellites. In the present constellation four satellites are geosynchronous (1A, 1B, 1D, 1E) and remaining is geostationary (1C, 1F, 1G). At present 1A satellite is not operational, its all rubidium atomic clocks on board IRNSS-1A are failed. A new satellite is expected to be launched soon. The system is expected to be operational from early 2018 after a system check. It will provide Standard Positioning Service (SPS) for civilian users and a Restricted Service (RS) for authorized users [8]. Its performance is degraded by several sources of errors such as multipath effects, clock error, DOP (Dilution of Precision),

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‘Multipath and Thermal noise free Relative TEC Estimation using IRNSS L5 and S1 Signals’

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Multipath and Thermal noise free Relative TEC Estimation using IRNSS L5 and S1 Signals

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***Abstract*— Indian Regional Navigation Satellite Systems (IRNSS) is an autonomous system developed to cater navigational and precise time needs over the Indian region and its surrounding. There are various error sources that degrade the positional accuracy of the user. Prominent among them is ionospheric time delay error which is a function of Total Electron Content (TEC). But, the TEC estimation is influenced by the multipath and thermal noise. Therefore, multipath and thermal noise free relative TEC measurements are made and compared with TEC estimated by two other methods, namely, code TEC and IRNSS Receiver Software (IRS) techniques. The L5 (1176.45 MHz) and S1 (2492.028 MHz) signals from IRNSS 1A and 1B satellites are considered in our analysis. The results due to these three techniques indicate that relative estimation technique gives a better performance in terms of smoothness indicating the removal of multipath and thermal noise from the TEC measurements. This will be helpful in proper estimation of ionospheric time delay. In view of this, the relative TEC estimation technique can be used in the IRNSS receiver instead of the present IRS technique.**

Keywords—IRNSS, TEC, Relative TEC, etc.

I. INTRODUCTION

Global Navigation Satellite Systems (GNSS) signals are low power signals propagating through space to Earth. They get affected by various parameters in the propagation path. Ionospheric time delay is one of the prominent errors that affect the positional accuracy of GNSS receiver. The ionospheric time delay can be properly estimated when two coherent signals from the same satellite propagate through dispersive ionosphere. For GNSS applications, several ionospheric time delay models are proposed [1]. For these models, precise TEC estimation is necessary. In the case of GPS, the ratio of the L1, L2 and L5 signals (L1/L2=1.28; L1/L5=1.34) is much less than the ratio of IRNSS S1 and L5 signals (S1/L5=2.19). The high ratio of IRNSS signals is expected to facilitate better estimation of TEC. Further, this delay is directly proportional to the Total Electron Content (TEC). It is to be noted that TEC estimation is influenced by the multipath and thermal noise. A signal arriving at an antenna through different paths due to reflection / diffraction represents multipath phenomenon [2]. Thermal noise is a basic electric noise produced by random movement of electrons in any conductor (including components in IRNSS/GPS receiver)[3]. Once TEC is estimated, the delay can be calculated using a standard expression. TEC can be estimated using either code or carrier phase observations or both. Indian Regional Navigation Satellite System (IRNSS) is a newly added satellite based regional navigation system developed by Indian Space Research Organisation (ISRO). It transmits two frequencies, L5 (1176.45 MHz) and S1 (2492.028 MHz). Recently, a few papers are published on the analysis of L5 and S1 signals [4, 5 and 6]. With the launch of IRNSS-1F on 28 April 2016, the first phase of IRNSS constellation is completed and is declared fully operational [7]. Currently, field trials are going on to analyze the performance of IRNSS at various research organisations and academic institutions in India. Data is available in two formats, namely, Receiver INdependent EXchange format (RINEX) and National Marine Electronic Association (NMEA) data. Apart from these, receiver is also providing data in Comma Separated Value (CSV) format and is termed as IRNSS Receiver Software (IRS) format in this analysis. It contains all the mandatory calculations including user and satellite position information [8]. In this paper, TEC is estimated using three prominent techniques, namely, code, Relative (code and carrier phase) and IRNSS Receiver Software (IRS) techniques. Further, corresponding ionospheric time delay is also estimated for L5 and S1 signals using standard equation. Also, at present IRNSS 1A signal is not being used for position estimation due to failure of three atomic clocks onboard [9]. As data was collected for 17th June 2016, this problem was not encountered.

II. ESTIMATION OF CODE DIFFERENCE AND CARRIER DIFFERENCE OF S1 AND L5 SIGNALS

There are several techniques to estimate ionospheric time delay. One technique is to use code difference measurements of dual frequency receiver. Another technique involves the measurements of both code and phase. These techniques are described in the next section. This section deals with the calculations of the code difference and phase difference of L5 and S1 signals to simplify the calculation of both TEC estimation techniques.

The pseudorange observation equations are given as [10],

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Analysis of PDFs of Ionospheric Scintillation Index Data due to Low Latitude Station

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***Abstract* - Ionospheric scintillations when severe, drastically affects the performance of GNSS system in terms of tracking error, navigation message and C/N_0. For characterization of amplitude scintillation index, four prominent PDFs namely lognormal, Weibull, Nakagami and Raleigh are considered. The Maximum Likelihood Estimation (MLE) method is used to compute the parameters of the PDFs. The Chi-square goodness of fit is used to choose the best fitting probability distribution. It is found that amplitude scintillation index data variations follow lognormal during daytime (4.27) and lognormal more closely than other density functions in the night time (0.92).**

Index Terms— ***GNSS, Ionosphere, Scintillation, PDF***

I. INTRODUCTION

The performance of the GNSS receiver is degraded by many errors including ionospheric delay and scintillations. Using Space Based Augmentation System (SBAS) grid model, the ionospheric error can be reduced [1]. The refractive index of the ionosphere is a function of free electronics, and fluctuations in refractive index induces fluctuations in the propagating signal. These fluctuations are called as scintillations. Scintillations are a function of operating frequency, local time, season, geomagnetic activity, eleven years solar cycle and geographic location [2]. Scintillations are usually expressed by using two indexes namely S_4 for amplitude and σ_ϕ for phase scintillations. Scintillations are more predominant in low and high latitude regions effecting both amplitude and phase of the GNSS signals. Severe scintillation condition can prevent a GPS receiver from locking on to the signal and reduce the performance of the system [3]. The refractive index is a function of free electrons, variations of the scintillation index are random, and the behaviour can be characterized by using a Probability Density Functions (PDFs) [4-5]. Very limited research work has been reported on characterizing ionospheric scintillation index data using PDFs. In one of the research paper scintillation index data was characterized by using Nakagami distribution [6]. To identify which PDF the present low latitude station data exactly follows, four prominent PDFs lognormal, Weibull, Nakagami and Raleigh are considered in the investigation.

II. THEORETICAL BACKGROUND

For a data consisting of p scintillation index data observations $\{x_n\}$, $n = 1, 2, 3, \ldots p$, the empirical PDF, $f(x)$ is given as [7],

$$f(x) = \frac{p_x}{ph} \tag{1}$$

Where, h is bin size centered at x, and p_x is the number of observations lies between $x \pm h/2$. The shape of the probability density curve depends on the bin size.

Several methods are suggested in the literature to identify bin width h [8]. However, in this paper, we considered lognormal, Weibull, Nakagami and Raleigh PDFs. The expressions for the considered PDFs are as follows [9-10].

i) The lognormal PDF $f_{ln}(x,\theta_{ln})$ is given as

$$f_{ln}(x,\theta_{ln}) = \frac{1}{x\sigma\sqrt{2\pi}}\exp\left(-\left(\frac{(\log x - m)^2}{2\sigma^2}\right)\right) \tag{2}$$

where, θ_{ln} gives the parameters of the density function with m as mean and σ^2 as variance.

ii) The Weibull PDF $f_{wd}(x,\theta_{wd})$ is given as,

$$f_{wd}(x,\theta_{wd}) = \frac{a}{b}\left(\frac{x}{a}\right)^{a-1}\exp\left(-\frac{x}{b}\right)^a \tag{3}$$

where, $\theta_{wd} = [a,b]$ is a parameter vector with shape (a) and scale (b) parameters.

iii) Nakagami PDF $f_N(x,\theta_N)$ is given by,

$$f_N(x;\theta_N) = \frac{2m^m}{\Gamma(m)\Omega^m}x^{2m-1}\exp(-\frac{m}{\Omega}x^2) \tag{4}$$

where, θ_N is parameters with m is shape parameter and Ω is scale parameter.

iv) The Raleigh PDF $f_R(x,\theta_R)$ can be expressed as,

$$f_R(x,\theta_R) = \frac{x}{\sigma^2}e^{-x^2/2\sigma^2} \tag{5}$$

where, θ_R is a parameter vector with σ^2 variance.

Each density function parameters are computed by using Maximum likelihood estimation method. Chi-square goodness of fit test (χ^2) is used to identify the best suitable probability distribution from the considered distributions.

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"Performance Evaluation of Mixed-Pair method of Estimation of Ionospheric Gradients on IRNSS L5 Signals",

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Performance Evaluation of Mixed-Pair method of Estimation of Ionospheric Gradients on IRNSS L5 Signals

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***Abstract*—Mixed-Pair method is one of the well-known techniques for estimation of spatial gradients of ionospheric delay. This technique has been extensively used to compute gradients of delay on GPS L1 signals. No significant work is reported on computation of gradients on IRNSS signals using this technique. In this paper, the performance of Mixed-Pair method is evaluated in the context of IRNSS L5 signals. It is observed that with this method, gradients estimated due to the combination of IRNSS 1D and 1E (Geo-Synchronous satellites) is resulting in gradients at short base-lines (tens of kms), whereas, all the other satellite combinations are yielding gradients at long base-lines (hundreds of kms). Therefore, it is inferred that this method can be effectively applied to study the spatial variation of ionosphere over both short and long baselines, especially in IRNSS based DGPS applications.**

Keywords— IRNSS, L5 signals, Ionospheric spatial gradients, Mixed-Pair method

I. INTRODUCTION

Indian Regional Navigation Satellite System (IRNSS) is a result of Indian Space Research Organization's (ISRO's), endeavor to have India's own satellite-based navigation system. IRNSS is a regional satellite navigation system that provides Position Velocity and Timing (PVT) information to users over Indian landmass and regions extending to 1500 kms around Indian boundaries. Currently, there are seven satellites in IRNSS constellation, with three satellites in GEO orbit at 83°E (IRNSS 1C), 32.5°E (1F), 131.5°E (1G) and four satellites in GSO orbit at 55°E (IRNSS 1A and 1B) and at 111.75°E (1D and 1E) [1]. The two pairs of GSO satellites move in such a way that they form a figure of '8', while crossing the equator. All the satellites broadcast signals on two frequencies namely L5 (1176.45 MHz) and S1 (2492.028 MHz). Like any other satellite navigation system, IRNSS signals also experience delay as they pass through the ionosphere and systems working on IRNSS L5 band experience larger delays compared to those on S-band. Also, in low-latitude regions, ionosphere is highly variable both spatially and temporally and these variations affect the performance of Differential GPS (DGPS) systems serving both local-area and wide-area. Accurate low-latitude ionospheric time delay modelling and precise estimation of ionospheric spatial gradients play an important role in designing and developing reliable Augmentation Systems [2],[3]. Ionospheric spatial gradients are estimated using three prominent techniques, namely Time-Step method, Station-Pair method and Mixed-Pair method [4]. In Time-Step method, the difference of ionospheric delays experienced by a satellite at two distinct epochs of time divided by Ionospheric Pierce Point (IPP) separation distance (at those two epochs) results in the estimation of gradients [5]. As IRNSS satellites are either GSOs or GEOs, the time interval between the two epochs has to be sufficiently large to obtain the estimates of gradients over large distances. But, such a huge time interval induces temporal gradient in spatial gradient computations. In Station-Pair method, the difference of ionospheric delays experienced by a pair of stations due to a single satellite, at a particular instant of time, is divided by the corresponding IPP separation distance to estimate the gradients. The disadvantage with this method is that a close network of stations is required to obtain gradient estimates over short base-lines. Mixed-Pair method employs configurations such as one station observing two satellites, two-stations observing two-satellite pairs etc. [6]. In this paper, the performance of this technique is analyzed in the context of IRNSS L5 signals, with an emphasis on the IPP distances covered.

II. METHODOLOGY

Data is acquired from the IRNSS-GPS-SBAS receivers located at CBIT (17.39°N, 78.32°E) and Osmania University (17.24°N, 78.31°E) stations located at Hyderabad, India. The receiver provides significant parameters such as satellite position, elevation, azimuth, pseudoranges, clock parameters, doppler shift, ionospheric and tropospheric delays, etc for all the satellites in Comma Separated Value (CSV) format. Slant ionospheric delays on L5 signal corresponding to each satellite are extracted from the CSV file and converted to vertical delays with the help of mapping function [7]. The gradients of vertical ionospheric delays are computed using Mixed-Pair method. Two configurations of this method are considered, the first is, one station viewing two satellites and second is, two stations viewing two different satellites.

A. One Station – Two Satellites

In this method, the vertical ionospheric differential delays ($Id'_{R_{i,j}} - Id'_{R_{i,j}}$) experienced by a pair of satellites (i, j), with respect to a station ($R_{i,j}$), at a particular instant of time, divided

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Performance Analysis of Different Spatial Domain Methods for Traffic Control Using Image Processing: A LabVIEW approach"

Performance Analysis of Different Spatial Domain Methods for Traffic Control Using Image Processing: A LabVIEW Approach

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***Abstract*—In this paper, we present a scheme for performance analysis of spatial domain methods, namely, Laplacian, Arbitrary, Sobel and Prewitt operator methods for traffic control using an image processing with LabVIEW approach, including timing constraints are used to control the signal along the cross-road signal posts. In this paperwork, the reference image and the real-time image captured from the camera is loaded in the image acquisition of LabVIEW. To process the acquired image, four different methods of kernels namely Arbitrary, Laplacian, Prewitt and Sobel methods are used to obtain an edge detection image. The edge detection images have stored and captured images are compared and the Root Mean Square Error is calculated to estimate the timing constraints to operate the traffic signal lights on a four-lane dynamically. LabVIEW graphical programming tools are used for the development of the scheme and simulation results are shown. Finally, the performance of the four methods analyzed using an image quality metric RMSE value to estimate the time in order to allow the vehicles in a particular direction and dynamically to switch them on and off control from one particular direction to another.**

***Index Terms*—Image Processing, Laplacian operator, Arbitrary operator, Sobel operator, Prewitt operator, Traffic management.**

I. Introduction

The spatial domain method, namely Prewitt, Laplacian, Sobel and arbitrary [2,3] are used for edge detection of the stored image and acquired a real-time image. However, the performance analysis of kernel of four different spatial domain edge detection methods. The edge detection method used in time estimation and traffic control is lacking in the literature [4,5]. Therefore, we introduce the scheme using LabVIEW approach and the block diagram is shown in Fig. 1.

In prior, the empty road image is stored in the database, without any vehicles on the road [6]. The image is converted into an array, where four different edge detection methods are applied to convolve with the store image as well as the real-time image captured to generate edge detection of the stored image and the real-time image. The Root Mean Square Error metrics are applied to compute the result analysis of the stored and captured edge detected images. Based on the error obtained, the time estimation is calculated and applied to the traffic light display pole, then the vehicles are allowed to move in one direction to the other directions. The procedure is followed for all the directions dynamically with respect to the traffic density existing in the particular direction.

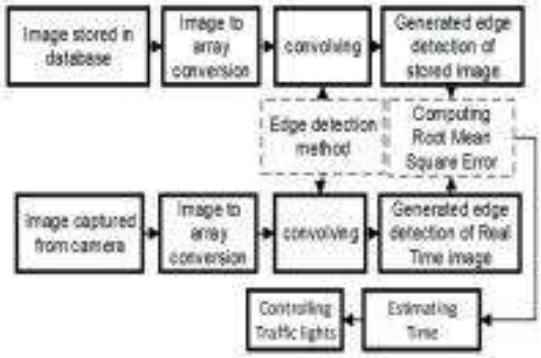

Fig. 1. Block diagram of the edge detection using spatial domain methods.

Therefore, four different spatial domain edge detection methods are applied to distinguish the edges of the original image. The major problem of the traffic signals is manually done by the traffic police. Hence, focused on annotation of timing without human intervention, using camera vision is the approach to reduce the human resource and computational cost. The Sobel operator edge detection method is a discrete differential operator to compute an approximated gradient of an image to change the intensity levels. The remaining three edge detection methods with different types of masks or kernels of the Laplacian (positive and negative) operators, Prewitt (vertical and horizontal) operator, arbitrary operator and Sobel (vertical and horizontal) operator are used for conducting a test on real-time images captured from the specified location. Further, the error estimation on the desired images is calculated to analyze and manage the timing with respect to the lane to switch on and off the signaling of the signal post.

The paper consists of seven sections. Section II states the related work with spatial domain, Laplacian, Prewitt,

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Performance Analysis of Different Transform Methods for Image Steganography: A LabVIEW approach

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***Abstract*— In this paper, we present a scheme for performance analysis of transform methods namely DCST, FDOST, BIOR2.2 and Haar for image steganography using LabVIEW approach with four stego keys with one, two, three and four LSB bits to embed person details in person image (Online e-filing application form). In this work, hidden text message containing the personal details with different payload (1kbyte to 4kbytes) converted into binary, and then the binary hidden message is embedded into the cover image to obtain stego image. The stego image is transformed using DCST, FDOST, bior2.2, and Haar to produce DCST, FDOST, bior2.2 and Haar coefficients. The hidden message using different keys with the original image is retrieved by applying four different inverse transform methods. LabVIEW programming tools are used for the development of scheme presented and execution of the graphical code for simulation. Finally, the performance of the four methods is analyzed using image quality metrics PSNR and MSE with and without steganography.**

Keywords — Image steganography, Fast Discrete Orthonormal Stockwell Transform (FDOST), Discrete Cosine Stockwell Transform (DCST), Biorthogonal, HAAR

I. Introduction

The transform methods namely DCST, FDOST, bior2.2, and Haar [1, 2] used for compression of stego image [3]. However, the performance analysis of this methods and stego key with more than two LSB bits lack in the literature [4]. Therefore, in this paper scheme using LabVIEW approach presented, the block diagram of this scheme as shown in figure 1.

In the person image (cover medium), personal details (embedded message) are embedded using LSB technique to obtain stego image [5, 6]. Then by applying transformation methods to stego image to obtain transform coefficients by using four different transform methods and then transmitted through a medium to the receiver. At the receiver end, the selected inverse transformation method used to retrieve the stego image and LSB technique with correct stego key stood for searching precisely detectable structure in the extracted one, two, three or four bit/s, applied to obtain the text message. The right stego key [7] resolved through a thorough stego key search by measuring the samples of the embedding path. Steganography furnishes with the potential ability to hide the presence of the secret message and finding hardness of identifying the information embedded in an image.

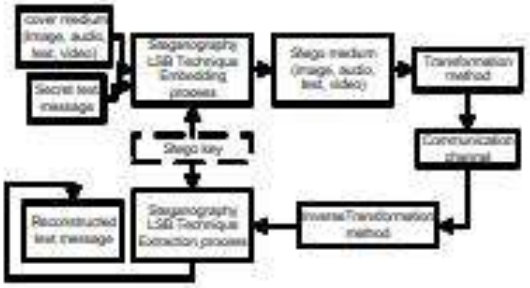

Fig. 1. Block diagram of steganography with transformation method

Therefore, four different compression methods on stego image applied and transform coefficients being to be transmitted. The related work on the multiresolution disintegration of the Stockwell Transforms (ST) [8, 9] is valuable but redundant and computationally costly. From the beginning of this, we will concentrate on its discrete orthonormal form, the DOST to accomplish the desirable efficiency and compactness. The DOST [10] is a readied adaptation of ST. The multiresolution analysis, the time-based resolution required for a low frequency in view of the sampling theorem. In general, individuals are dealing with low frequency dominated groupings in the field of image processing. In those groupings, the useful information kept in the low frequencies, which makes it sensible to drop some high-frequency information to accomplish a good approximation. Because of the multiresolution nature of the FDOST and Time-Frequency Representation (TFR), an approximation can be performed by dropping or controlling time - or/and frequency - specific FDOST coefficients [11]. Fast Discrete Orthonormal Stockwell Transform demonstrates that, various very straightforward modifications made to get different required properties. For instance, this paper presents a real valued Discrete Cosine based DOST (DCST) [12]. Finally, we apply the FDOST and DCST in the evolution of direct compression analysis and contrast with bior2.2, and HAAR compression.

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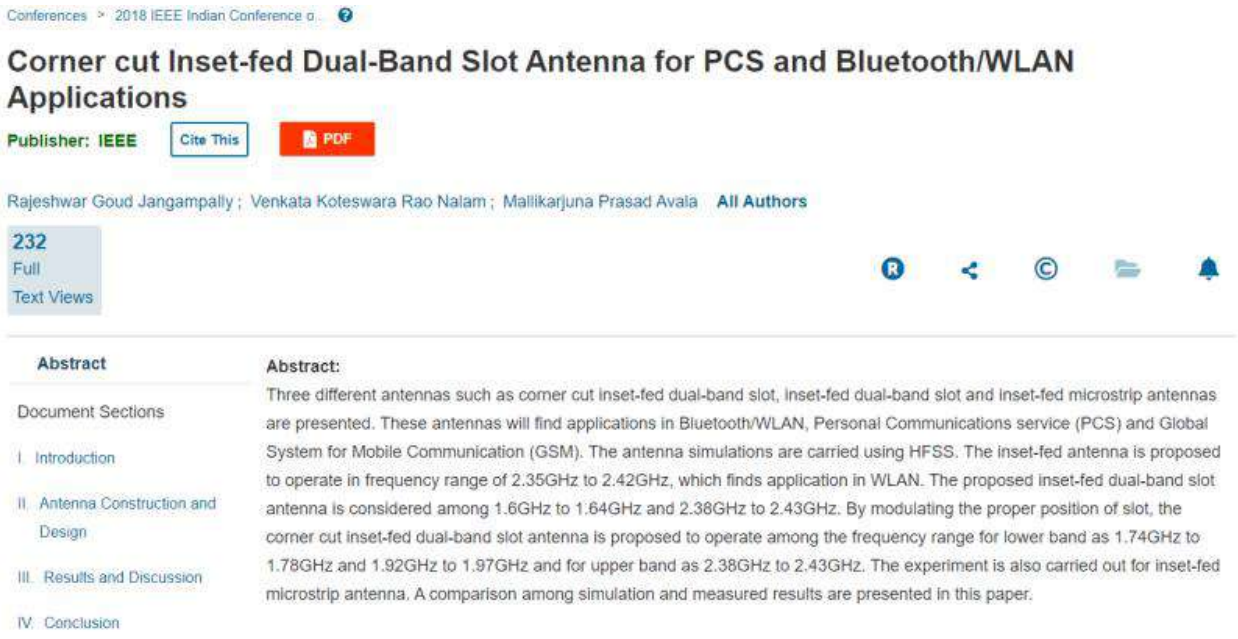
“Wavelet Packet: A Multirate Adaptive Filter for De- noising of TDM Signal”
“Corner cut Inset-fed Dual-Band Slot Antenna for PCS and Bluetooth/WLAN Applications”



"Receiver Bias Estimation of Indian GAGAN System using FRB Technique for Equniox Days: Preliminary Results"

"Estimation of GNSS Receiver Bias using Fitted Receiver Bias (FRB) Method"

Estimation of GNSS Receiver Bias Using Fitted Receiver Bias Method

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ABSTRACT

Global Navigation Satellite System (GNSS) is a collective term given to all the satellite based navigation systems that provides accurate user position, velocity and timing information anywhere in the world. Among various GNSS, GPS is the first operational GNSS. GPS positional accuracy is mainly affected by ionospheric time delay error, which depends up on, the Total Electron Content (TEC) (the integral of the electron density along the ray path between satellite and receiver, it provides the number of electrons per square meter). TEC measurements are corrupted by receiver instrumental bias. The instrumental biases occur due to the frequency dependent delays of analog hardware within the GPS satellite and receiver. Hence, to compute the user position, estimation of receiver bias is essential. One of the simple and less complex method for estimation of receiver bias is Fitted Receiver Bias (FRB) method. To carry out this work, GPS data was collected from two GPS receivers (NovAtel Dual frequency GPS receiver (GSV4004B) at Begumpet (Lat: 17.45°N Lon: 78.47°E) and (GPStation6 (NovAtel) at Hyderabad (Lat: 17.40°N Lon: 78.51°E)), India. In this paper, the receiver instrumental bias of two different receivers was estimated using FRB method. It was observed that estimated receiver bias for NovAtel receiver was -6ns and GPstation6 receiver was -11ns. Two GPS PRN satellites data were considered. In GSV4004B receiver, PRN16, PRN22 and in NovAtel receiver, PRN2, PRN12 satellites were considered. Before removal of instrumental bias, the TEC values obtained were negative values and after removing the receiver bias, the TEC values obtained were positive values. Hence, FRB method is very helpful for estimation of GPS instrumental biases, which greatly helps in improving the user position accuracy for Civilian Applications, such as transportation, search, and rescue operations etc.

Keywords: *Fitted Receiver Bias, GNSS, Receiver instrumental bias and Total Electron Content*

INTRODUCTION

Satellite navigation has evolved from being purely under the control of USA, Department of Defense. In the present day, there are multiple GNSS like GPS of USA, such as GLONASS of Russia, GALILEO of the European Union, and Beidou of China. Accordingly, there are Regional Navigation Satellite Systems (RNSS) like Indian Regional Navigation Satellite System (IRNSS) of India, and Quasi Zenith Satellite System (QZSS) of Japan. A user can determine his position - latitude, longitude, and altitude by receiving signals from these satellites with the help of an appropriate GNSS receiver. The position accuracy of GPS system is limited by

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"IOT Based status tracking and controlling of motor in Agricultural Farms"

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IOT BASED STATUS TRACKING AND CONTROLLING OF MOTOR IN AGRICULTURAL FARMS

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***Abstract*— In India, majority of the population's income by any means depends on agriculture. So it is of cardinal importance to effectively use the technology to enhance vital resources. Nowadays husbandman in agricultural fields are facing many snags due to perceptual power cuts, lack of ground water, motor malfunction. The panacea to overcome motor problems is smart agriculture. This paper gives the solution using raspberry pi3, android and web applications to control the motor using parameters: circuit for tracking power status, ground water availability and motor status. An android application is developed in order to monitor the above three parameters and also to control the motor in farm accordingly.**

Keywords—IoT, Raspberry Pi3.

I. INTRODUCTION

IoT is the web of devices and gadgets to transfer the data with no or little human intervention. Hence, to gain high coherence, IoT works in collaterally with agriculture to obtain smart farming. In 21st century, many agricultural industries turned to adopt IoT for smart agriculture to improve efficiency, productivity, global market and other features such as minimum time, human intervention, and cost etc. The advancement in the technology drives the sensors to be more economic, reliable and small. As internet is also globally accessible, smart farming can be achieved with full pledge. Focusing on innovation in agriculture, smart farming is the panacea to the problems that agricultural industries is currently facing. The solution can be produced using smart phones and IoT devices. Farmer can get any required data or information as well can monitor his agricultural field.

II. IOT IN AGRICULTURE

Internet of things has been providing its audacity across the industries such as retail, banking, telecom industry, manufacturers and more. Amidst the various industries, the one sector it is quickly catching up with is, the agriculture. With the concept of digitization and smart farming, it is gaining popularity like never before and is coming with the potential to offer high precision crop control, data collection and automated farming techniques.

III. NEED OF IOT IN AGRICULTURE

A prediction by the food and agriculture arm of the United Nations (FAO) bluntly says, that the production of food worldwide should see an escalation of 70% by 2050 to feed the ever growing population. The industrial professionalists believe that IoT could play a vital role in meeting this need. Combined with data analytics, it can improve the efficiency of inputs like soil moisture, fertilizers, pesticides, monitoring the livestock and soil nutrition, predicting plant diseases, monitoring storage capacities like water tanks, and ensuring crops are fed and watered well through sensors and actuators. It shows an overall potency to increase the productivity with a reduced cost.

IV. PROBLEMS FACED BY FARMERS

We say India is an agricultural country. Yes, it feeds a billion people but let us acknowledge that ours is not a flourishing one. Agricultural sector is in a state of distress, which is severely affecting many farmers. Many farmers are committing suicides because of debt burden, loss of crop. The government has also announced many schemes to resolve these problems. But these schemes are not solutions to farmer's problems because it provides only temporary relief. We witness many suicidal deaths even after the announcement of these schemes. Some problems faced by them are as shown below.

A. Irregular Power Supply

The supply of power to Indian agriculture, vital for successful irrigation, is in particularly grave condition. Supply is neither reliable nor of the steady quality needed to avoid damaging the irrigation pumps it runs and severely disrupting irrigation and farming operations. The electricity supply is vital to farmers who use electric pumps to irrigate their fields

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A Bandwidth Enhanced U-Slot PIFA with defected ground structure for dual-band mobile Applications

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Abstract: ***The Planar inverted-F antenna (PIFA) is compact antenna and it is widely used in hand-held communication terminals. Despite their favorable features of excellent performance characteristics, low-profile and flexibility of integration, the PIFA is inherently of small bandwidth. Since present day need for multi band communication by a single device, there is necessity for a multi band PIFA. The present work proposes a novel configuration of Planar Inverted-F Antenna (PIFA) for dual band operation with bandwidth enhancement for hand-held wireless communication devices, which is achieved by modification of the physical structure of both radiating patch and of the ground plane. Simulated and measured results demonstrate that the new configuration covers two frequency bands with a considerable bandwidth improvement.***

Index Terms: Bandwidth, Cognitive Radio, Planner antennas, Resonance, Return-Loss, Ultra Wideband, HFSS.

I. INTRODUCTION

There has been an explosion of wireless communication technology in recent times in terms of bandwidth, multi-functionality and miniaturization. The imminent and considerably large commercial deployment of ultra-wideband (UWB) systems has spawned the need of ultra-wideband antennas. The fusion of different radio units into single radio unit has requires multi-band antennas [2].

In miniaturization of the hand held communication terminals, has put limitations on the physical size of the antenna and these aspects influence to choose the low profile, multi-band multi-functional and ultra wideband frequencies. The main drawback of many low-profile antenna designs are the narrow impedance bandwidth and which in turn affects the wideband functionality requirement. The need for multi functionality in terms of multi band operation gives rise to the ability of band-switch-ability of the antenna.

PIFA is having the feasible solution due to its reduced space in the device, its omni-directional pattern and its integrability as a circuit element. The operation of this antenna can be understood easily with the help of other techniques or technologies like, quarter-wavelength monopole and rectangular micro-strip technic. Dual band operation is achieved by cutting a U-slot on the radiating patch of PIFA, and operational bandwidth is enhanced by implementing a Defected Ground Structure (DGS). The U-shaped Slot in the radiation patch the antenna is divided into two categories like radiating patch antennas, the outer patch is working in the lower frequency band (900MHz) and the inner patch in the higher frequency band (1800MHz) [3]. A method of introducing narrow apertures in the ground plane which alters the distribution of currents in it, is a popular way to improve the bandwidth performance[5]. These slots in the ground plane would resonance at same frequencies and therefore may increase the bandwidth. PIFA can be simply represented by a capacitor with shorted plates so anything that lowers the capacitance and so the Q factor, that should result in enhanced band width.

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On the Suitability of Ionospheric Gradient Estimation Techniques for IRNSS based GBAS Applications

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***Abstract*—Time-Step method and Station-Pair method are prominent techniques for estimation of spatial gradients. Since GBAS is meant to serve a limited area of about 50kms of an airport for aircraft Precision Approach and landing, these two methods were considered for gradient estimation within the GBAS service area. Much of the work on these techniques has been reported for GPS-based GBAS applications. In this paper, the suitability of these methods to IRNSS-based GBAS applications is investigated. It is observed that since IRNSS satellites are either GEO or GSO, the time interval (Δt), of Time-Step method should be significantly high (30min for GSO), to obtain gradient data for GBAS' service area. With the Station-Pair method, a dense network of stations, each separated by not more than 1-2 kms is required.**

Keywords— IRNSS, GBAS, Ionospheric spatial gradients, Time-step method

I. INTRODUCTION

Indian Regional Navigation Satellite System (IRNSS) is a regional satellite-based navigation system designed, developed and implemented by Indian Space Research Organisation (ISRO), to provide navigation services over Indian region. It consists of a combination of three satellite in GEO orbit (IRNSS 1C at 83°E, 1F at 32.5°E, 1G at 131.5°E with an inclination of −5°) and four satellites in GSO orbit (IRNSS 1A and 1B at 55°E, 1D and 1E at 111.75°E with an inclination of 29°±2°). All the satellites transmit on two frequencies namely L5 (1176.45 MHz) and S1 (2492.028 MHz). Both the signals experience a delay as they pass through the ionosphere, but S-band signals experience significantly less delay. Also, as India is located in equatorial/low latitude region, severe spatial as well as temporal variability of ionospheric delay is a common phenomenon in this region. The spatial variation of delay (named as spatial gradient) is an important parameter affecting the performance of Local Area DGPS systems like Ground Based Augmentation System (GBAS). Therefore, quantifying and characterizing the gradients is considered as a challenge in the design of robust GBAS systems. Time-step method Station-Pair method and Mixed-Pair method are prominent techniques for estimation of gradients [1],[2]. The suitability of Time-Step method and Station-Pair method was investigated for estimation of spatial gradients on GPS L1 signals within a limited area of 50 kms for Indian GBAS applications and found to be appropriate [3],[4]. In this paper, suitability of these techniques for estimating spatial gradients on IRNSS L5 signals is investigated for IRNSS-based GBAS applications.

II. METHODOLOGY

Data acquired from the IRNSS-GPS-SBAS receivers located at CBIT (17.39°N, 78.32°E) and Osmania University (17.24°N, 78.31°E) stations, Hyderabad, India, is used in this paper. Dual frequency measurements provide precise estimates of ionospheric delay [5]. Raw code and carrier measurements on L5 and S1 frequencies are extracted from the RINEX data. The ionospheric delay on L5 is estimated using code measurements and carrier-phase measurements following the standard equations [6]. The noisy code-based estimates of delay are smoothed using carrier phase-based estimates. The resulting smoothed estimates of delays are slant delays and converted to vertical delays by multiplying with standard Obliquity Factor [7]. The gradients of vertical ionospheric delays are computed using Time-Step method and Station-Pair method.

A. Time-Step method

In this method, the difference of the vertical ionospheric delays experienced by given satellite-receiver pair 'k' at two distinct epochs of time ($Id^{k}_{t1} - Id^{k}_{t2}$) is divided by the corresponding Ionospheric Pierce Point (IPP) separation distance (d) to obtain the gradient of vertical ionospheric delay ($VIG^{k}_{t1,t2}$).

$$VIG^{k}_{t1,t2} = \frac{\left| Id^{k}_{t1} - Id^{k}_{t2} \right|}{d} \qquad (1)$$

IPP latitude and longitude are computed using standard equations [8]. The time-interval ($\Delta t = t_1 - t_2$), can be chosen and varied in order to vary the IPP distance and thereby obtain gradients over the area of interest.

B.Station-Pair method

In this method, difference of vertical ionospheric delays ($Id^{k}_{R1} - Id^{k}_{R2}$) experienced by a pair of stations (R_{r1}, R_{r2}) is divided by the IPP distance (d) between the stations to estimate the Vertical Ionosphere Gradients ($VIG^{k}_{R1,R2}$).

$$VIG^{k}_{R1,R2} = \frac{\left| Id^{k}_{R1} - Id^{k}_{R2} \right|}{d} \qquad (2)$$

The gradients are computed for all the IRNSS satellites for several days using these two techniques (Eqns. 1 and 2). However, results due to IRNSS 1B on a typical day (15 May 2017) (1<Kp<5) are presented here.

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Design and Implementation of Low Noise Amplifier (LNA) for IRNSS Receiver

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***Abstract*—The Low Noise Amplifier (LNA) is the important design in the receiver architectures. Amplification is one of the most basic functions in modern RF and microwave systems. In order to amplify the signal received from the antenna in a RF system, LNA is required. The main function of LNA is to amplify signals without degrading its Signal-to-Noise Ratio (SNR) at extremely low power levels. The front end of any receiver is typically a LNA, whose function is to provide enough gain to overcome the noise of subsequent stages. Aside from providing this gain while adding as little noise as possible, an LNA should receive large signal without distortion and frequently must also prevent specific impedance, such as 50Ω to the input source. As the present LNA's have the Noise Figure greater than 6dB and the consumption of power is more. The following paper illustrates the design of an LNA for Noise Figure ≤ 4dB and Forward Gain≥10dB.**

Keywords*—*LNA, Narrow Band,RF Front End.

I. Introduction

Wireless Operations permit services, such as long range communications that are impossible and impractical to implement with wires. The rapid increase of wireless services and other telecom applications has forced the semiconductor industry towards complete system-on-chip solutions. As we know wireless systems comprise of a front-end and a back-end section. The front-end section consists of all the filters, Low Noise Amplifiers (LNA's), down to conversion mixers and processes analog signals in the high Radio Frequency (RF) range while the back-end section processes analog and digital signals in the low frequency range. The band of Radio Frequency (RF) in the electromagnetic spectrum is from 100 KHz to 100 GHz and this band is used for radio communication.

In general, the frequencies less than 1GHz are represented as baseband frequencies while those greater are described as RF. The process of analog signals in RF circuits must be done with a considerable dynamic range of high frequencies. The received RF signal from the antenna contains noise as the signal travels in air which acts as wave guide and this makes the signal weak. So we need to amplify the RF signal for further subsequent stages. Therefore, an amplifier with a high gain and good performance in noise is needed to amplify the signal before it can be fed to other parts of the receiver. Such an amplifier is mentioned as a Low Noise Amplifier (LNA) and forms an essential component of any RF integrated circuit receiver. The performance of receiver depends on Low noise amplifiers (LNA's) because the signal which is received contains noise which represents the amplifier noise and this noise should be minimized. As the received signal might be very weak due to propagation of signal in air, an LNA is used to amplify the signal and the noise associated with the signal. The total noise performance of the receiver depends on the Gain and Noise Figure of the Low Noise Amplifier (LNA), as can be seen from the Friss formula. As defined by IEEE, L band is from 1 to 2 GHz range of radio spectrum. This frequency band is widely used for Indian Regional Navigation Satellite System (IRNSS) applications.

IRNSS is an independent regional navigation satellite system being developed by India. It is designed to provide accurate position information service to users in India as well as the region extending up to 1500km from its boundary, which is its primary service area. An Extended Service Area lies between primary service area and area enclosed by the rectangle from Latitude 30° South to 50° North, Longitude 30° East to 130° East. IRNSS will provide two types of services, namely, Standard Positioning Service which is an encrypted service provide only to the authorised users such as defence and military.

II. Low Noise Amplifier

A. Topology

The primary stage in the RF receiver design is Low Noise Amplifier (LNA). The frequency of operation of an Low Noise Amplifier (LNA) is in RF frequency band, the circuit should be as flexible as possible, especially for the RF path. Otherwise, if the circuit path is too complicated, the noise of the circuit becomes too high. If the noise is too high the Signal to Noise ratio of the system degrades. Therefore, the parasitic effects may distort the amplified signal. In order to prevent these effects, there are several fundamental Low Noise Amplifier (LNA) topologies for single ended narrow band low power low voltage design, such as resistive termination common source, common gate, shunt series feedback common source, inductive degeneration common source, cascode inductor source degeneration. There are techniques in topologies for Low Noise Amplifier (LNA) design.

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‘Indoor Propagation of IRNSS Signals: Priliminary Results

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Indoor Propagation of IRNSS Signals: Preliminary Results

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***Abstract*— With latest technologies most of the smart devices are expected to work in all types of environments including indoor scenarios. But, conventional Global Navigation Satellite System (GNSS) receivers when used in indoor environments face difficulty in dealing with the propagating signals, hence channel modeling of signals in indoor is necessary. In this paper, experiments are carried out using IRNSS S1 and L5 signals at three indoor locations to compare their performance with the corresponding outdoor locations only differed by altitude. The experimental environment and effect of signal obstructions are explained using C/No and system specifications. The results would be useful in designing indoor applications of IRNSS.**

Keywords*— *Indoor propagation, IRNSS, S1 Band, L5 Band

I. Introduction

Indoor positioning systems are becoming more popular because of increasing number of electronic devices and applications relating to telecommunications and Internet-of-Things (IoT). System designers need to understand the effects of various environments on the propagating signals. The statistics of propagation effects keeps on changing with respect to the size, shape and construction materials of the building and operating frequency. Several models are designed and developed for characterizing the signals in indoor scenario [1-2]. Limited work has been done to statistically characterize the propagation effects inside the buildings for signals in the frequency range of 800 MHz to 5.8 GHz with respect to satellite signal applications [3]. Indian Regional Navigation Satellite System (IRNSS) S1 signals are new for satellite applications, thus investigation of IRNSS S1 and L5 band signals in indoor and outdoor environment is interesting. This work investigates the IRNSS S1 band signal behavior and compares with L5 band signal in a particular indoor/outdoor environment. For this, we have performed several experiments in indoor and outdoor scenarios.

II. IRNSS

Indian Regional Navigation Satellite System (IRNSS) is India's own regional independent navigational satellite system. The constellation consists of three Geo Stationary (GEO) and four Geo Synchronous (GSO) satellites. The IRNSS is expected to provide the positional accuracy of 10m over Indian landmass under open sky environments. The satellite navigation system has several applications and the positional accuracy of IRNSS can be further improved by using latest error modelling techniques [4-5]. Under a Memorandum of Understanding (MoU) with Space Application Centre (SAC), Indian Space Research Organization (ISRO), Ahmedabad, IRNSS receiver was installed at CBIT, Hyderabad, (17.39°N, 78.31°E). The receiver data is stored in two different formats, namely, raw data and NMEA data. Raw data is a binary file that can be converted to the two data formats Receiver Independent Exchange (RINEX) and Comma Separated Value (CSV) format. The user can convert the CSV files into different spreadsheet programs. The files contain several parameters including 3D RMS user position (ECEF), satellite position (elevation, azimuthal in degrees) and signal strength (dB-Hz). Minimum operating received Carrier to Noise Power (C/N_o) for both S1 and L5 signals is 28 dB-Hz. Signal acquisition sensitivity is -165dBW. Receiver self-error contribution is very nominal and is approximately <0.15m at C/N_o > 42dB-Hz [6]. Frequency tracking range is ±10 KHz.

III. Indoor Propagation Models

For better designing of systems, understanding of the indoor propagation characteristics of a radio wave signal in terms of channel model is required. For indoor applications, several path loss models are available in the open literature. Prominent among them are; Motley and Keenan model [7], Seen model [8], Partition Attenuation Model [9-10] and Log-Distance or Log-Normal shadowing model [12]. Each one of these models has certain benefits and drawbacks. For example, Motley Kenn Model has worked on multifloor environment. Signal strength, transmitting antenna and receiving antenna power levels are important considerations for this model and it is a general model without considering wall attenuations. Similarly, Pechac and Klepal has developed Partition Attenuation model, which is useful for successfully modelling the WLAN systems in 2.4GHz ISM Band. But these systems are highly dependent on average signal strength in a specific location and also on fading statistics.

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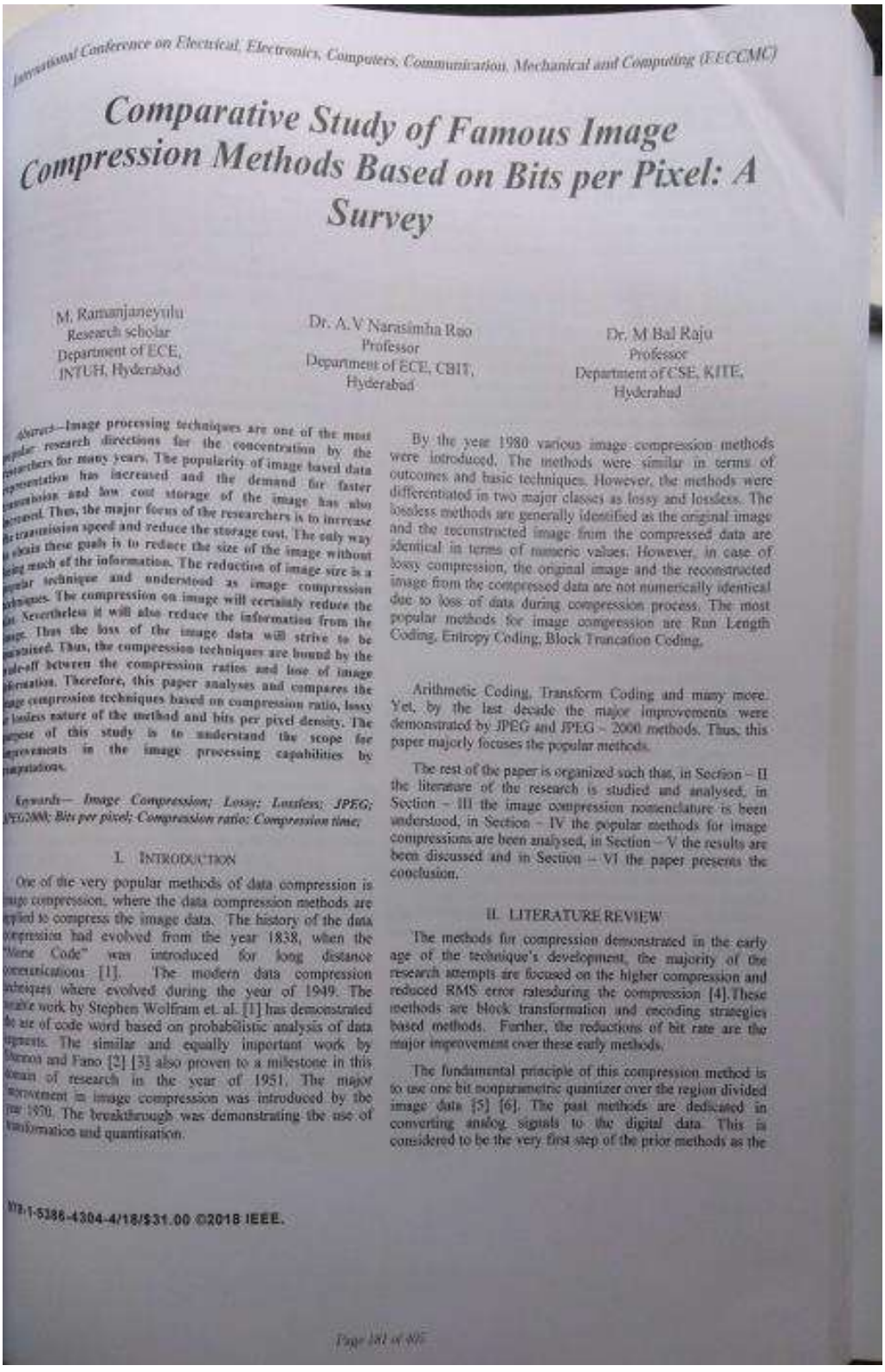
"A Comparative Study of Famous Image Compression Methods Based on Bits per Pixel: A Survey"



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Comparative Study of Famous Image Compression Methods Based on Bits per Pixel: A Survey

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Abstract—Image processing techniques are one of the most popular research directions for the concentration by the researchers for many years. The popularity of image based data representation has increased and the demand for faster transmission and low cost storage of the image has also increased. Thus, the major focus of the researchers is to increase the transmission speed and reduce the storage cost. The only way to obtain these goals is to reduce the size of the image without losing much of the information. The reduction of image size is a popular technique and understood as image compression techniques. The compression on image will certainly reduce the size. Nevertheless it will also reduce the information from the image. Thus the loss of the image data will strive to be maximized. Thus, the compression techniques are bound by the trade-off between the compression ratios and loss of image information. Therefore, this paper analyses and compares the image compression techniques based on compression ratio, lossy or lossless nature of the method and bits per pixel density. The purpose of this study is to understand the scope for improvements in the image processing capabilities by computations.

Keywords— Image Compression; Lossy; Lossless; JPEG; JPEG2000; Bits per pixel; Compression ratio; Compression time;

I. INTRODUCTION

One of the very popular methods of data compression is image compression, where the data compression methods are applied to compress the image data. The history of the data compression had evolved from the year 1838, when the "Morse Code" was introduced for long distance communications [1]. The modern data compression techniques where evolved during the year of 1949. The notable work by Stephen Wolfram et. al. [1] has demonstrated the use of code word based on probabilistic analysis of data segments. The similar and equally important work by Shannon and Fano [2] [3] also proven to a milestone in this domain of research in the year of 1951. The major improvement in image compression was introduced by the year 1970. The breakthrough was demonstrating the use of transformation and quantisation.

By the year 1980 various image compression methods were introduced. The methods were similar in terms of outcomes and basic techniques. However, the methods were differentiated in two major classes as lossy and lossless. The lossless methods are generally identified as the original image and the reconstructed image from the compressed data are identical in terms of numeric values. However, in case of lossy compression, the original image and the reconstructed image from the compressed data are not numerically identical due to loss of data during compression process. The most popular methods for image compression are Run Length Coding, Entropy Coding, Block Truncation Coding,

Arithmetic Coding, Transform Coding and many more. Yet, by the last decade the major improvements were demonstrated by JPEG and JPEG – 2000 methods. Thus, this paper majorly focuses the popular methods.

The rest of the paper is organized such that, in Section – II the literature of the research is studied and analysed, in Section – III the image compression nomenclature is been understood, in Section – IV the popular methods for image compressions are been analysed, in Section – V the results are been discussed and in Section – VI the paper presents the conclusion.

II. LITERATURE REVIEW

The methods for compression demonstrated in the early age of the technique's development, the majority of the research attempts are focused on the higher compression and reduced RMS error ratesduring the compression [4].These methods are block transformation and encoding strategies based methods. Further, the reductions of bit rate are the major improvement over these early methods.

The fundamental principle of this compression method is to use one bit nonparametric quantizer over the region divided image data [5] [6]. The past methods are dedicated in converting analog signals to the digital data. This is considered to be the very first step of the prior methods as the

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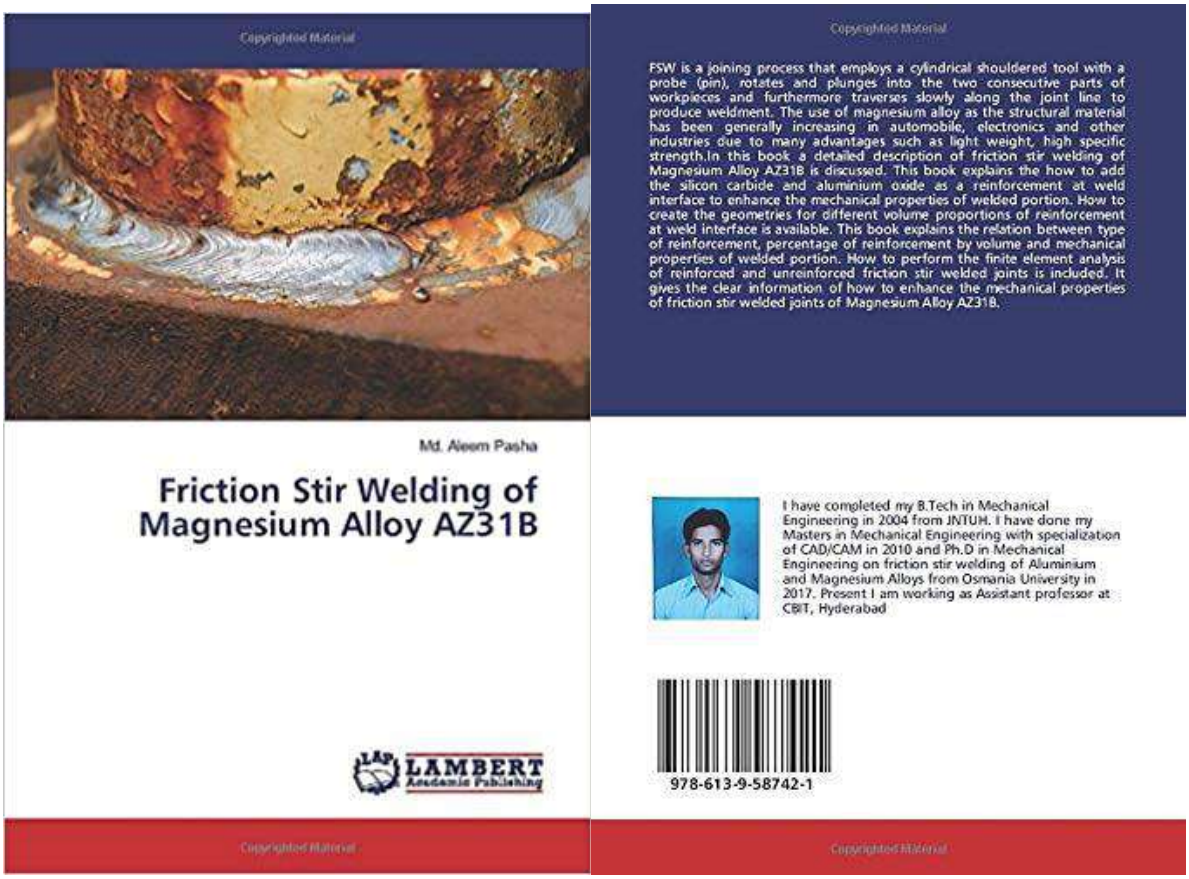
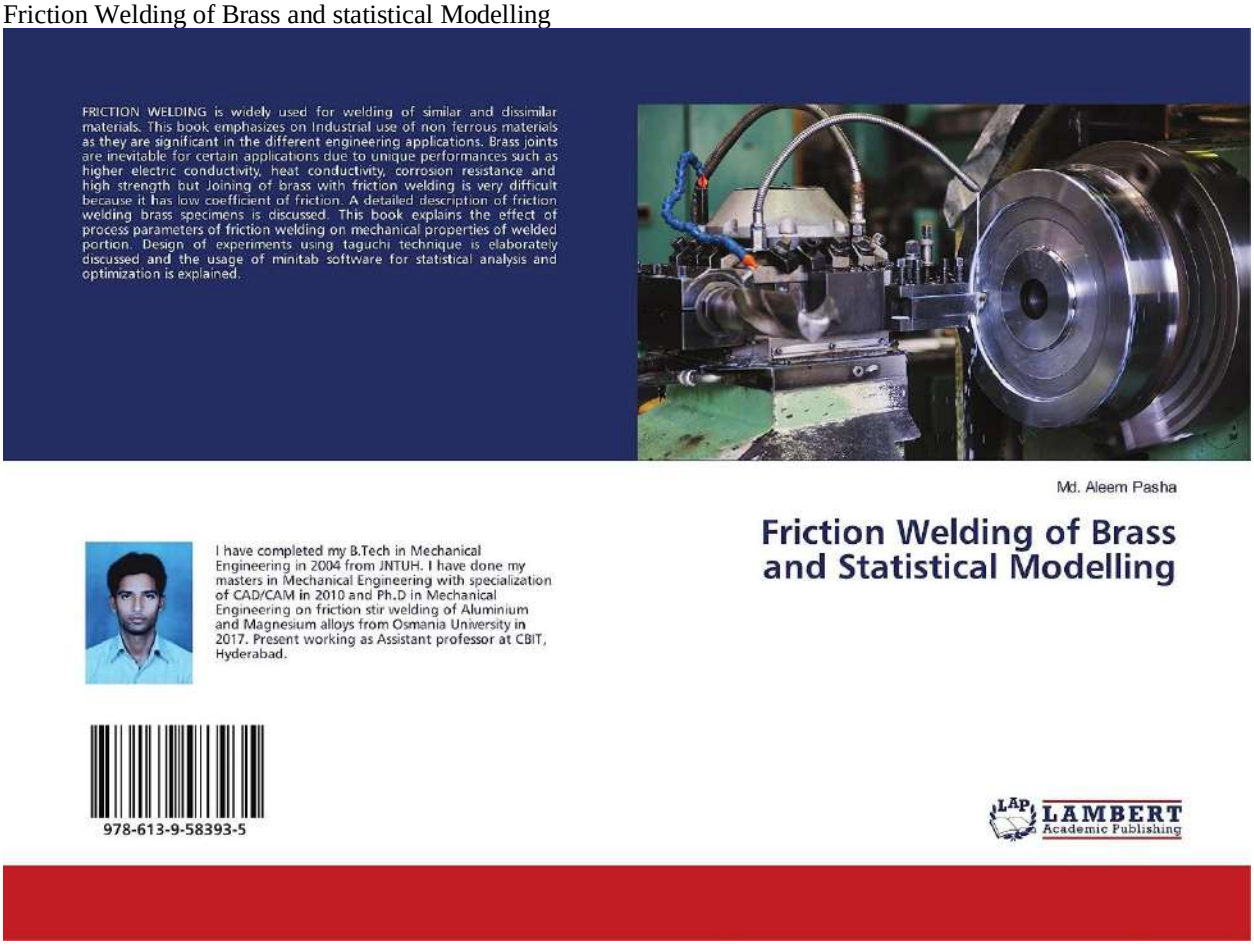
Friction Stir Welding of Magnesium Alloy AZ31B



Friction Welding of Brass and statistical Modelling



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Reinforced and Unreinforced Friction stir welding of AA6061

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Reinforced and Unreinforced Friction stir welding of AA6061

LAP Lambert Academic Publishing (2018-03-21)

€ 55,90

This book presents the enhancement of mechanical properties of friction stir welded portion of Aluminium alloy 6061 by incorporating additional reinforcing particulates of silicon carbide and aluminium oxide at weld interface. Silicon carbide and aluminium oxide has been added as reinforcement by creating separate geometry, at the edges, where the welding is interface with four different volume proportions such as 10%, 15%, 25% and 30%. Tool steel of H13 grade is used as friction stir welding tool. Quality assessment is carried out by visual inspection and non-destructive testing using florescent and radiography to reveal the surface and volumetric defects. Mechanical testing including tensile test, impact test, bend test and hardness test were conducted to study the behavior of reinforced and un-reinforced friction stir welded joints. Metallurgical evaluation has been performed by capturing the microstructures of base materials and at different zones of nugget, heat affected zone (HAZ) by optical microscope to reveal the grain size and grain refinement at different zones.Finite element analysis has been carried out by ANSYS software to know the temperature distribution.

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Strengthening and Joining by Plastic Deformation pp 163–182

SiC and Al_2O_3 Reinforced Friction Stir Welded Joint of Aluminium Alloy 6061

Md. Aleem Pasha, P. Ravinder Reddy, P. Laxminarayana & Ishtiaq Ahmed Khan

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Abstract

This research presents the enhancement of mechanical properties of friction stir welded portion of aluminium alloy 6061 by incorporating additional reinforcing particulates of silicon carbide and aluminium oxide at weld interface. Friction stir welding (FSW) of AA6061, each plate of 200 mm × 100 mm × 4 mm thickness with silicon carbide and aluminium oxide as reinforcement at weld interface in four different volume proportions and without reinforcement are performed on vertical milling machine. In the present research, comparison has

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Experimental investigation on utilization of RCA in low, medium and high strength self-compacting concrete

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

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

1. Introduction

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

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

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

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

1. Introduction

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

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Study on Mechanical Properties of Recycled Coarse Aggregate Concrete with Stone Dust

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Abstract **- In the recent times, usage of recycled coarse aggregate (RCA) as replacement of natural aggregate in concrete is gaining popularity all over the world. In the process of preservation of the environment and sustainable development, recycled coarse aggregate (RCA) is playing a major role in the construction industry. RCA is obtained by crushing the construction rubble obtained from demolished structures. Many countries are giving many infrastructural laws relaxation for increasing the use of recycled aggregates. River sand is most commonly used fine aggregate in the production of concrete. Using river sand in large quantities poses the problem of acute shortage in many areas. In this regard, stone dust can be an economic alternative to the river sand. In the present study mechanical properties of the recycled coarse aggregate concrete with stone dust are compared with that of conventional concrete made of natural aggregates and river sand. M20 and M30 grades of concrete are designed as per IS 10262-2009 and IS 456-2000. Tests were conducted on cubes, cylinders and prisms to study the strength of concrete made of stone dust and recycled aggregate. Recycled coarse aggregate (RCA) used in this work is obtained from crushing old tested concrete cubes to replace the natural coarse aggregates (NCA) in different proportions. Experiments were conducted using 0%, 30%, 60%, 90% replacement of natural coarse aggregate with recycled coarse aggregate and 0%, 50%, 100% replacement of fine aggregate with stone dust. Concrete specimens were tested after 7 and 28 days of curing. Results shows that the concrete with 100% stone dust and upto 60% recycled coarse aggregate qualifies as a substitution of conventional concrete**

KeyWords: **Recycled aggregate, stone dust, compressive strength, split tensile strength and flexural strength.**

I. INTRODUCTION

In the world of construction, concrete, like other materials is playing an important role in development. Concrete is a composite material which is a mixture of cement, fine aggregate, coarse aggregate and water. The major constituents of which is natural aggregate such as gravel, sand, alternatively, aggregates such recycled aggregate, manufactured sand furnace slag, fly ash, expanded clay, broken bricks and stone dust may be used where appropriate. It has many advantages including low cost, general availability of raw material, adaptability, low energy requirement and utilization under different environmental conditions. It is most common practice in all over the world that most of the materials are being recycled to save the natural resources and environment. Concrete is such a costly material but waste concrete is only being used as a landfill material instead of recycling the concrete as a recycled concrete aggregate (RCA) to use for the construction purposes. There is need to improve its properties like workability, strength and durability. The research has been executed in order to utilize smaller quantities of fine aggregate and coarse aggregate, also to conserve our natural resources and reduce the cost of construction. The goal of sustainable construction is to reduce the environmental impact.

II. LITERATURE REVIEW

Mamery Serifou, et al., (2013) It is observed that the compressive strength decreases gradually with increase of the percentage of recycled aggregates. This relationship can be approximated by a polynomial function with $R2$=0.92. The substitution of natural aggregates with 25%, 50%, and 100% of recycled aggregates decreases the compressive strength by about 15%, 25%, and 32%, respectively. The decrease in tensile strength is by 18% when 100% of the recycled aggregates are incorporated.

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Seismic Response Study of Multi-Storied Reinforced Concrete Building with Fluid Viscous Dampers

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***Abstract*-Damping plays an important role in design of earthquake resistant structures. It reduces the response of the structure when they are subjected to lateral loads. There are many different types of dampers in use. In the present study Fluid Viscous Dampers (FVD) are used to evaluate the response of RC buildings. One of the important properties of structure is to receive the effect of lateral loads and transfer it to the foundation. Since the lateral loads acting on a structure due to earthquake are dynamic in nature, they cause vibrations in it. In order to handle these vibrations, fluid viscous dampers are used in the design of earthquake resistant structures. In this study, structures of square and rectangular shaped floor plan with columns of square and rectangular shaped cross- sections are analyzed. ETABS 2015 software is used for finding the response of the structures with and without FVD by performing push over and time history analyses. It is observed that the performance of the structures with square columns is better in terms of response when compared to the structures with rectangular columns irrespective of the shape of floor plan. In Time History analysis, up to 90% decrease in the time period is observed when FVD's are used. FVD-250 reduced the base shear of the structures by 70%. Displacements of top storey are minimized by 90% with the use of FVD's. Hence FVD's can be used in RC multistoried structures to reduce the response effectively.**

***Keywords*: Earthquake resistant structures, Fluid Viscous dampers (FVD), ETABS, push over analysis and time history analysis.**

I. INTRODUCTION

The viscous fluid dampers (VFD) are used to control response of the structures. They are used based on different construction technologies in order to decrease the structural response due to the seismic excitation. The devastative effects of the recent earthquakes such as Northridge earthquake (1994), Kobe earthquake (1995), and Taiwan earthquake (1999) on the buildings of cities adjacent to fault and with regard to the close location of many of the cities of India to the active faults indicate the significance of the research.

In last few years, many essential developments in seismic codes have turned up. Seismic isolation and energy dissipation are widely recognized as effective protection techniques for reaching the performance objectives of modern codes. However, many codes include design specifications for seismically isolated buildings, while there is still need of improved rules for energy dissipation protective systems. [1]

II. LITERATURE

Y. Zhou, et al..2012 [2] "A practical design method for reinforced concrete structures with viscous dampers" shown how compared to the retrofitting technology of seismic isolation, the installation of viscous dampers to those existing buildings are more realistic because of easy construction. However, the design of viscous dampers, which provides a high level of damping in a structure, was relatively new application in China for a well-established and proven technology in other seismically active regions in the world.

V. Umachagi, et al..2013. [3] "Applications of dampers for vibration control of structures: An overview" has briefly explained that viscous dampers works based on fluid flow through orifices. Viscous damper consists viscous wall, piston with a number of small orifices, cover filled with silicon or some liquid material like oil, through which the fluid pass from one side of the piston to the other.

Liya Mathew & C. Prabha. 2014. [4] published "Effect of fluid viscous dampers in multi-storied buildings" in which they mentioned that special protective systems have been developed to enhance safety and reduce

Power quality improvement using custom power devices

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Power Quality Improvement using Custom Power Devices (AVC, DVR, APC)

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***Abstract*—Power Quality exertion has happen to more complex at all stages of power system. Nowadays a new concept of custom power is used for customer's satisfaction. This paper presents a wide-ranging survey of custom power devises in order to get better quality of power. Custom power devices (CPDs) with DVR, AVC and APC be replicated on the customized IEEE 16 bus radial division scheme by Matlab to examine efficiency of every device in a variety of PQ disorders together with voltage sags, harmonic distortions and voltage disturbance. Results of this work show that the application of every apparatus to recompense dissimilar PQ disorders depend on the device's features.**

Keywords*— *Active voltage conditioner, Dynamic voltage restorer, Active power Conditioner, Custom power devices, Power quality, Power quality disturbance.

I.INTRODUCTION

As per consistency deliberation in power system generation unit must spawn acceptable quantity of power, transmission unit should provide highest power to each consumer's location form immensity power systems. Distribution system is situated at the end of consumer. The reason for this is fall down in the electric distribution network accounts for about 91% of the average consumer's intrusion. Earlier, power system consistency decisive on generation and transmission. But today, distribution system is receiving more attention as dependability is anxious. Power quality issues are achieving a chief anxiety due to the augment in number of responsive loads. Also the wide-ranging service of information technology equipment, adjustable speed drives (ASD), arc furnaces, electronic fluorescent lamp ballasts and programmable logic controllers (PLC) have entirely altered the exciting masses scenery. These masses are the foremost sufferers of power quality trouble. the non-linearity of these loads cause disturbances in the voltage waveform. The utility will likely to deliver a low deformation unbiased voltage to its consumers, particularly those with responsive loads. For the enhancement of reliability and power quality of system, the custom power devices are introduced into the power system. DVR, AVR, APC etc. are some of the major devices used for the improvement of voltage sag and swells. With the help of these FACTS devices[12], we are competent of decrease the trouble related to power quality.

This document presents a swot on the most popular CPDs[1] counting AVC, DVR, APC under unlike PQ conflict. every tool is modelled on the adapted IEEE 16-bus [2] radial circulation scheme using Matlab. Numerous PQ issues are generated for investigation and compared.

II.POWER QUALITY DISTURBANCES

Electricity consumers face power quality problem at all stages of usage. Actually, Power quality[3] defines the assets of power supply distributed to the user in standard working conditions. New electronic equipments and devices are more prone to power quality problems[10,11]. Reduced PQ has become a major problem for both power suppliers and customers. Poor PQ means there is enough variation in the power supply to affect equipments and may lead to their mis-operation or failure. It is unfeasible to entirely manage conflict on the delivery scheme but labours and hoard are made by utilities to avoid interruption. standard operation for instance switching loads and capacitors or faults and opening of circuit breakers to apparent faults mainly cause disturbances. significant PQ issues those need realistic solutions are explained below:

A. Voltage Sag or Dip

Voltage sag Fig.1 is defined as a drop in the regular voltage stage linking 10 and 90% of the supposed rms voltage at the power incidence, for durations of 0. 5 cycle to 1 minute. It is clear from Fig:1 that voltage sag reduces the scale of voltage. association of heavy loads, activate of huge motors and faults in consumer's installation are the main reasons for voltage sag. initial of bulky induction motors can result in voltage dip as the motor draw a current up to 11 times the full load current throughout the starting. The Consequences of voltage sag are separation and loss of competence in electric revolving equipment, tripping of electro-magnetic relays and break down of in sequence knowledge apparatus namely micro-processor based control systems.

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Multi objective optimal power flow with generalised interline power flow controller using NSHCSA

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Multi-Objective Optimal Power Flow with Generalized Interline Power Flow Controller using NSHCSA

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Abstract— **A novel power injection model based on voltage sources for the latest multi-line controller namely, Generalized Interline Power Flow Controller (GIPFC) is proposed. The complete modeling is performed in two stages, one is for series voltage sources and the other is for shunt voltage source. In this modeling the switching losses of the converters are considered. The most commonly used power system objectives namely generation fuel cost along with device investment cost of IPFC and GIPFC, emission and total transmission power losses are optimized individually and as well as simultaneously while satisfying equality, in-equality, device constraints and practical constraints. For this, a new evolutionary algorithm by combining Genetic Algorithm (GA) along with Cuckoo Search Algorithm (CSA) is implemented as Hybrid Cuckoo Search Algorithm (HCSA) to improve the convergence characteristics of the single objective optimization problem and along with this a Non-dominated Sorting Hybrid Cuckoo Search Algorithm (NSHCSA) is proposed for multi objective optimal power flow problem. The proposed methodology is tested in standard IEEE-30 bus system with supporting numerical results.**

Keywords— Generalized Interline Power Flow Controller; Power Injection Model; Ramp-rate limits; Prohibited Operating Zones; Non-dominated Sorting.

I. INTRODUCTION

Latest development in FACTS technologies, two or more series and shunt converter combination devices are used to form the hybrid FACTS device. In [1] the basic topology and working principle of Generalized Interline Power Flow Controller (GIPFC) are discussed. GIPFC model is developed by using d-q coordinates for controlling the direct and quadrature components of the ideal source converters in [2]. In this [3], a newly surfaced nature-inspired optimization technique called moth-flame optimization (MFO) algorithm is utilized to address the optimal reactive power dispatch (ORPD) [illegible]

other objective is compromised Optimal Power Flow (MO-OPF) problem has been formulated in [5] paper. Swarm Intelligence methods, such as Particle Swarm Optimization (PSO) and Glowworm Swarm Optimization (GSO) have been used to solve the OPF problem with generation cost and emission minimizations as objective functions.

Further, on observation it is revealed that the power injection model (PIM) of FACTS devices is a powerful model than other models [6, 7]. A steady state control of power system parameters with current and voltage operating constraints has been presented by X.P.Zhang [8] in which it uses a multi control functional model of SSSC.

Mathematical models of generalized unified power flow controller (GUPFC), IPFC and their implementation in Newton power flow are described by X.P.Zhang [9] to demonstrate the performance of GUPFC and IPFC.

S. Teerathana et al. [10] proposed OPF method with IPFC to solve load flow problem and the power and the power generation with the minimum cost. An injection model for congestion management and total active power loss minimization in electric power system was developed Jun Zhang and Akihiko Yokoyama [11]. Suman Bhowmick et al. [12] have given an indirect unified power flow controller model to enhance reusability of Newton power flow codes. A current based model of static synchronous series compensator (SSSC) and interline power flow controller (IPFC) has developed by Vinkovic A and Mihalic R [13, 14].

In this paper presents the power injection model of GIPFC. To prove the effectiveness of the device, considered objectives are optimized individually and simultaneously by satisfying the equality, inequality, device and practical constraints. In this a novel optimization technique hybrid cuckoo search algorithm is proposed by combining basic cuckoo search algorithm with GA based crossover operation. Same

Simulation and Analysis of Single Phase Full Bridge Diode Rectifier with Different Passive Power Factor Correction Techniques

International Conference on Recent Innovations in Electrical, Electronics & Communication Engineering - (ICRIEECE)

Simulation and Analysis of Single Phase Full Bridge Diode Rectifier with Different Passive Power Factor Correction Techniques

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Abstract— It is needless to say that many industrial applications invariably demand DC power supply. As AC power is abduntantly available it is economical to convert it into DC and to used for industrial loads. Converter circuitary being fabricated with solid state components, the supply gets distorted with the harmonics injected. This problem can be overcome by placing proper passive filters in the input side which is evident from simulation analysis carried out in this paper by using different techniques The entire analysis is carried out in MATLAB/SIMULINK environment.

Keywords—single phase diode bridge rectifier, capacitive filter, passive power factor correction technique,THD

I. INTRODUCTION

For control of electric power it is required to convert power from one form to other form. As AC power more cheaper than DC power, so available AC power is converted to DC by using rectifiers. These rectifiers are part of many industrial applications. At low power levels, the application is in the area of computers, air-conditioning etc. At high power levels the application is in AC to DC drives. The output obtained from these drivers are given as input to inverters. Traditionally single phase AC-DC converters are developed by using diodes and thyristors to provide controlled and uncontrolled, unidirectional and bidirectional DC power. These rectifiers suffer from problems such as poor power quality in terms of current harmonics, voltage distortions, poor power factor, low efficiency at input ac mains. Various filters are used at input side and output side to reduce the ripple content in DC output, to improve efficiency, to reduce harmonics in Line current[1]

In this paper a Single-phase full bridge diode rectifier with capacitive filter and its drawbacks are analysed and techniques used to overcome the problems of capacitive filter are studied and simulated in MATLAB/SIMULINK.

II. CONVENTIONAL 1-Φ FULL BRIDGE DIODE RECTIFIER

Single phase diode rectifier with R-Load is shown in Fig-1. It consists of 4 diodes D1, D2,D3,D4. During positive half cycle of supply voltage the diodes D1, D2 conducts and during negative half cycle the diodes D3,D4 conducts and it's voltage and current waveforms are shown in Fig-2. It is observed from waveforms for both positive and negative cycles current flows through load is unidirectional. The ripple frequency is twice the supply frequency. The Peak Inverse Voltage(PIV) of the diode is V_m. The output voltage of Rectifier contains rippled i.e it contains both AC and DC components. These AC componenets are undesirable due to which efficiency reduces. So inorder to minimize ripple content filters are used, which leaves DC component to appear at output. Some important filters are capacitor, inductor, combination of capacitor and inductor. In most of industrial applications single phase diode rectifier with capacitive filter is used at input stage as it is cost effective solution and highly reliable in low power ranges[2]

The average output voltage $V_o = \frac{2 \times V_m}{\pi}$ (Volts)

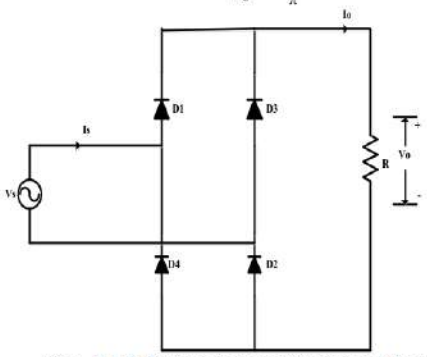

Fig-: 1-ϕ Full bridge diode rectifier without filter

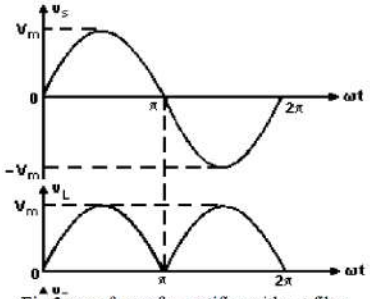

Fig-2 waveforms for rectifier without filter

III. SINGLE PHASE FULL BRIDGE DIODE RECTIFIER WITH CAPACITIVE FILTER

The rectifier without filter produces ripples due to which efficiency and power factor are low. So inorder to reduce ripples in the output, some of the energy is stored in capacitor and is allowed to discharges during pulses. Fig-3 shows the single phase full bridge diode rectifier with capacitve filter.. It is observed from Fig-3 a large capacitor is placed directly across the load terminals. The pulsating voltage from the rectifie without filter as shown in Fig 2 is applied to this capacitor. As we know that capacitor will

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Modeling and simulation of dual Redundant power inverter stage to BLDCM for MEA Application

Innovations in Electronics and Communication Engineering pp 167–174

Modeling and Simulation of Dual Redundant Power Inverter Stage to BLDCM for MEA Application

B. Suresh Kumar, B. V. Ravi Kumar & K. Sindhu Priya

Conference paper | First Online: 08 February 2019

624 Accesses

Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 65)

Abstract

The increasing demand for electrification functions on control surfaces of aircraft leads to a new concept of new advancement "more electric aircraft (MEA)". In the aviation industry, an electromechanical actuator (EMA) is used to maintain the orientation of aircraft, landing gears, and braking systems. As the electrical components such as inverter and BLDC motor are key components in EMA, the designing of these components became a critical issue. To enhance the reliability in actuation system in aircraft, this paper proposes dual redundant power inverter system to

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A New Technique for Designing Restoration Based Reliable WAMS Structure

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***Abstract*— Wide-Area Measurement System (WAMS) plays a significant role in recovering the historical data for power system post-mortem analysis. For this purpose, the paper presents a new methodology for partitioning a WAM network into number of WAMS regions. It enables restoration process easier. Later, it also suggests a reliable placement of Phasor Data Concentrators (PDCs). For this, transformer equivalent bus constraint, generation-load balance and observability constraints are considered. An IEEE-30 bus system is used for demonstrating the proposed scheme.**

***Keywords*— Power system Restoration, PMU, Reliability, PDC, WAMS.**

Nomenclature:
S_p: observability function for bus p, $S_p > 1$.
c_{pq} : Binary connectivity parameter.
r: the total number of regions.
n_r: the number of buses in each island,
P_{Gi}: The maximum generation at i^{th} bus
P_{Li}: the load at i^{th} bus
A_p : system connectivity matrix of p^{th} region.
x_p: PMU placement vector of p^{th} region
k :number of buses in p^{th} island.
A: system connectivity matrix.

INTRODUCTION

In general, power system is highly prone to interruptions in power supply even though many attempts were made to reduce the chances for the occurrence of failures. Sometimes, the power to a complete network will be lost and causes complete outage of network elements like generators, transformers and loads. This phenomenon is called Blackout, which is the most dangerous outage than any normal outage [1]. So, the power system elements need to be restored after blackout. The Build-up strategy achieves this restoration. This power system restoration should be effective as the latency in restoration leads damage to loads, and incurs economic and political costs. The build-up strategy proposed in [2] is followed in this work as it interconnects the islands after being restored separately.

The planning and importance of Build-up strategy are clearly explained in [2-5], but they failed in introducing ideas to sectionalize a network into separate islands. Reference [6] has suggested a method for sectionalizing the power system into islands but as it doesn't consider Generation-Load constraint during initial partitioning, it was failed in producing stable islands in initial partitioning and more number of islands for larger systems. The proposed technique has partitioned without disturbing the observability of every bus in every island.

A model based algorithm for partitioning the WAMS into different regions is proposed in this paper. Unlike [6], it considers generation-load constraint initially, and applies the observability constraint in the final stage of partitioning. Interestingly, this will improve the stability and the number of all the feasible islands. Hence, by separating the faulty islands, it protects the power system from the most dangerous events such as blackouts. Later, it suggests a new placement technique for placing Phasor Data Concentrators (PDCs). The proposed methodology is explained with the help of an IEEE-30 system.

This paper is organized as follows: the optimal PMU placement for the completed network is presented in section I. Section II discusses the constraints of restoration. Sections III and IV describe network partition and final modification. PDC placement is presented in section VI. Section VII concludes the paper.

I. OPTIMAL PMU PLACEMENT

The PMU uses Kirchhoff's laws to calculate different electrical quantities of all the buses connected to the bus where it is located. This section identifies the number of PMUs required for observing the system completely. Initially, the optimization problem was introduced in [7]. After, many heuristic method based approaches were presented to solve the optimization problem.

The proposed Optimal PMU Placement problem uses Binary Cuckoo Search (BCS) method for identifying the minimal PMU locations for complete observability. The locations of PMUs obtained using BCS are listed in Table 1. The problem can be formulated as:

Minimize

$$\sum_{q=N} x_q \qquad (1)$$

Subjected to $$s_p(X) \geq 1, \quad \forall p \in N \qquad (2)$$

Where $$s_p = \sum_{q=N} c_{pq} x_q , \quad \forall p \in N \qquad (3)$$

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Modeling, analysis and simulation of two level, three level voltage source converter for HVDC system

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Modeling, Analysis and Simulation of Two-level and Three-level Voltage Source Converter for HVDC System

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Abstract—With the development of power electronics technologies, control techniques and equipment, a new generation of HVDC technology based on Voltage Source Converters (VSC-HVDC) has evolved and becoming popular for power transmission under the sea and with underground cable. VSC-HVDC converters consist of Insulated Gate Bipolar Transistors (IGBT'S) switches, these IGBT switching devices work with high frequency Pulse Width Modulation (PWM) to get high-speed control of both active and reactive power and to create the desired output voltage waveform. This paper presents modeling, current control scheme and results of simulation studies on two–level and diode clamped three level inverter based VSC-HVDC system. Comparison of %THD for two-level and three-level VSC-HVDC system is also presented at the end.

Index Terms—VSC-HVDC, Two-level, Three-level,

I. INTRODUCTION

High Voltage Direct Current (HVDC) technology is an efficient and flexible method to transmit power compared to conventional AC transmission [1]. HVDC uses power electronics technology with high voltage and power ratings. HVDC usage instead of High Voltage Alternating Current (HVAC) for high power transmission is advantageous [6] for long distance power transmissions, long submarine power crossing, bulk power delivery with low line cost and losses [4]. HVDC offers an economical and reliable technique for asynchronous interconnections [1] between AC networks, renewable resources integration, fast and dynamic power flow control, and power system stability improvement [5]. As a result of using VSC technology and PWM, the VSC-HVDC has a number of potential features compared with classic HVDC [2].

The features allow VSC-HVDC converters to be suitable for a large range of applications related to power flow flexibility, fast response and recovery after the disturbances being cleared. As a result of these merits VSC-HVDC has been an area of growing interest, and it is also expected that VSC-HVDC will play an important role in future power systems. Hence, modeling, simulation and control aspects are essential for power system studies and interactions.

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II. VSC-HVDC

HVDC system based on VSC shown in Fig.1 normally uses the six-pulse connection. This converter produces lesser harmonics compared to LCC 12 -pulse converter that in turn reduces the circuit complexity. By this, the construction of the converter transformer is becoming simple [3].

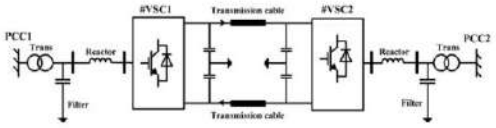

Fig. 1. VSC-HVDC system

A. Control strategy

In case of VSC-HVDC transmission systems, the transfer of power is controlled in the same approach as in the case of a classic HVDC transmission. The rectifier side controls the DC voltage, while the inverter side controls the active and reactive power [8]. With classic HVDC the reactive power cannot be controlled separately as of as the active power. VSC-HVDC makes it achievable to control the reactive and active powers independently. The reactive power flow can be controlled autonomously in each converter by the AC voltage that is requested set manually without changing the DC voltage. Thus, the active power flow, the reactive power flow and the DC voltage can be controlled using VSC-HVDC.

B. Current controller scheme

Current control scheme is the most popular control method used for VSC-based HVDC. The basic principle of the current controlled VSC method is to control instantaneous active and reactive powers independently [8]. The current control technique is shown in Fig. 2.

By employing synchronously rotating dq reference frame in current control scheme, the active and reactive powers are controlled independently. PLL is used to synchronize the turning on or off the power devices, calculate and control the flow of active power or reactive power by

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Efficient Classification of Diabetic Retinopathy using Binary CNN

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***Abstract*— Diabetic Retinopathy (DR) is a fastly spreading disease that may lead to loss of vision if not quickly detected and treated. Early-stage detection is beneficial to restrict the progress of disease and reduces the recovery expenditure. The current detection process of DR heavily depends on domain experts. Machine-dependent approaches are gain attention with large-scale fundus image repositories to overcome this difficulty. Recent techniques with deep learning are successful in getting noticeable results with pre-trained networks. However, the increase of memory occupancy and runtime with existing models is the bottleneck. We propose Binary Convolutional Neural Networks (BCNN), which drastically reduces memory consumption and faster the execution process to combat this problem. Our model is hardware friendly and efficient in DR classification with large scale fundus images. Experiments conducted using the Kaggle dataset reduce memory consumption by 37% and increase runtime by 49% compared to the base model.**

Keywords—Binary CNN, Deep Learning, Diabetic Retinopathy, Kaggle

I. INTRODUCTION

Diabetic retinopathy is the result of long-term diabetes that affects the eyes and causes blindness. DR usually introduces the blood vessels into the larynx (that is, the retina), which is the main reason of vision loss nowadays [1]. While the current results may be positive, it will take time and confidence in a trained employee's knowledge. Existing DR identification solutions are time-consuming and rely on trained professional experience. Several efforts have been made in recent years to develop automated solutions for DR detection to address this issue. In the early stages, various learning and traditional mechanical methods are use to test for DR. Most of the solutions described have two components: feature extraction and detection algorithm [2]. These features components depend on the parameters of the activation tools used, such as displaying objects, lighting, objects, sound, external attention, and sensitivity to background images' quality. These feature-based methods use to execute a particular project. The color fundus photography is more complicated than traditional images. The main images are reduced in the background and are often based on discrimination between sound and objects [3].

Diabetes Mellitus Edema (DME) is a DR-related complication that occurs at any stage of DR, usually due to fluid retention or vascular edema of the macula [4]. Structures such as microvascular, hemorrhage, heavy ejaculation, and low bowel movements are near related to DR. Each of these abnormalities indicates levels of DR in the patient. The severity of DME depends on the shortening of the main enzymes in the macula. The main reason for using a learning tool is to load the processing algorithm directly. This method works well, but it can also cause some problems. With a lot of knowledge and tools, everyone has helped to improve the DR recognition tool. However, high blood sugar levels, in the long run, destroy blood fats and nerves, causing complications such as cardiovascular disease and blindness. Early detection and treatment of DR hindered its development as progression. Automated Retinal Image Analysis Systems (ARIA) systems today are not sophisticated enough for DR classification with different stages [5]. This identification of a subtle change between classes is a daunting task for the retinal imaging technique. The diagnosis of DR depends heavily on observations and evaluation to photograph procedures that may take time, even for experienced professionals. Therefore, computer-aided automated diagnostic methods have great potential for accurate detection of DR in the clinic quickly, which can help improve the screening frequency of DR and reduce blindness [6].

Deep learning approaches have recently played an essential role in recognizing DR with Convolutional Neural Networks (CNNs) [4, 7]. The concepts of existing DR methods can be dividing into three main categories. (1) Machine learning-based approaches: Knowledge-based jobs are channel into distributor training, then distributors select candidates and further determine whether the candidate's position is damaged or not. (2) Machine learning with Deep learning approaches: These methods use deep learning to create jobs and are commonly used in machine learning. (3) Pure Deep learning approaches: With large amounts of tagged data, the pre-prepared network type can automatically display the original images with end-to-end training [7].

II. RELATED WORK

The research carried on classifying DR using Pretrained models and customized models described in this chapter. Some of the crucial contributions relevant to the quantized features and model optimizations are discussed below.

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Feature Selection Optimization Using a Hybrid Genetic Algorithm

ICT Analysis and Applications pp 411–421

Feature Selection Optimization Using a Hybrid Genetic Algorithm

E. Padmalatha, S. Sailekhya, Saif Ali Athyaab & J. Harsh Raj

Conference paper | First Online: 16 December 2020

Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 154)

Abstract

The curse of dimensionality plays a vital role in data mining and pattern recognition applications. There are two methods which can address curse of dimensionality namely—feature reduction and feature selection (FS). The application of FS is such that it selects the most relevant subset of features with the less redundancy. Main objective of the proposed method is to manipulate irrelevant features and redundant features in (high–medium–low) dimensional data. We will aim to provide higher classification accuracy. In this proposed method, it is

Genetic Algorithm. In: Fong, S., Dey, N., Joshi, A. (eds) ICT Analysis and Applications. Lecture Notes in Networks and Systems, vol 154. Springer, Singapore. https://doi.org/10.1007/978-981-15-8354-4_41

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Essentials of Blockchain Technology for Modern World Applicati

VAAGDEVI
COLLEGE OF ENGINEERING
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Machine Learning Technologies and Applications pp 193–201

An Efficient Deep Learning Based Approach for Malware Classification

Madhurima Rana & Swathi Edem

Conference paper | First Online: 16 March 2021

Part of the Algorithms for Intelligent Systems book series (AIS)

Abstract

With the advent of new age computing and swift development of electronic devices that are connected over the network is a biggest challenge in the field of computer science and information security. Malicious software or malware can compromise any user's sensitive data like stealing, hijacking, altering, encrypting, stealing, and tracking the activity, and so on without permission. With the mounting level of complexity of Malware detection, defense in real time is the biggest challenge in the information security domain. In the last few years, many machine learning

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Face detection authentication analysis on smartphones

Face detection authentication analysis on smartphones

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Face detection authentication analysis on smartphones

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Abstract: Smartphones are the absolute very most widely known in addition to significant personal systems. Along with their traditional make use of, that is, referring to as and also texting, they have also been used to do multiple security-sensitive activities, including electronic banking in addition to purchasing, social networking, taking pictures, and also e-mailing. On a positive side, smartphones have boosted the quality of life by offering multiple services that customers need, for example, anytime-anywhere processing. Nonetheless, on the other side, they also pose safety as well as private privacy hazards to the customers' saved data. Consumer authentication is the preliminary series ofdefense to avoid unwarrantable accessibility to the mobile phone. New smartphones using Apple and additionally Samsung have utilized face features to understand their individuals. These smartphone distributors assert that this present-day technology is actually among the most risk-free and also safe and secure in addition to trusted biometrics methods. This paper checks out the functional components of the face identity method installed in these smartphones. Completion results of this particular questionnaire have presented that the majority of cell phone individuals are fulfilled with the face detection strategy while opening their phones. Nevertheless, 59 per-cent of smartphones carry out not utilize face detection approach while doing getting in the app store, offering much a lot less trust fund on this function where economic packages are consisted of.

1. Introduction

Face Recognition has become a brand-new means for secure and safe and secure authentication for cellular telephones. As cellular phones are coming to be substantially solid, the security of the records kept in cellphones is a subject matter of concern; the data may be e-mail handles, sensitive as well as essential information, and so on. Although today phones possess regulation protection to fund, a face recognition system is a lot extra guarded and pliable. In the face recognition component, just through examining the show screen one might open their phone display. Although figure printing is one of the

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An IOT Based Environmental Monitoring System

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An IOT Based Environmental Monitoring System

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Abstract: In this paper, Our team organized an autonomous robot system that is made as well as executed to note environmental standards like temp, moisture, sky premium, and also hazardous gas attention. The robot possesses GPS coordinates as well as it may always keep files on the ThingSpeakIoT system. The mobile robot is regulated with a cell phone that runs an application built on the Android system. The whole system is discovered using a cost-efficient ARM-based inserted system called Arduino as well as additionally Raspberry Private detective which is consistent via a wireless network to the IoT system, where files are conserved, fine-tuned as well as may be accessed making use of a pc or any clever device originating from anywhere. The system might boost sensor details to IoT servers every 15 secs. The kept details might be utilized for extra customer review of the decline of pollution, additional energy and likewise supply a general dwelling establi shing enlargement. The robot system has produced for cost-effective remote monitoring environmental guidelines with no human treatment to stay clear of health and wellness and also wellness threat properly. A proof-of-concept model has been established to reveal the performance of the proposed system.

1. Introduction

Mobile robots possess a lot of requests including monitoring as well as also security, cargo of items, house goals, in addition to, etc. These robots utilize outlook for picking up as well as steering clear of obstacles. In

A Trust Based Method for Providing Secure Data Transmissions in Mobile Ad hoc Networks

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***Abstract*— Now a days Mobile Ad hoc Networks (MANET) are being part of many other heterogeneous networks including "Internet of Things (IoT)". Because of lack of Infrastructure, dynamic topology, Constraints on resources, sharing of bandwidth, security is always a great challenge and critical concern in Mobile Ad hoc Networks. A number of security solutions are proposed but they are not sufficient to provide security in Mobile Ad hoc Networks effectively. In this paper, a trust based approach is proposed which takes into consideration the direct observations of the node and neighbor recommendations about the node under consideration for evolving the final trust. This approach calculates trust based on the behavior of the node by considering network parameters. Simulation results under various performance metrics show that the proposed model performs efficiently.**

***Keywords*— MANET, Dynamic Topology, Security, Direct Trust, Neighbor Trust, Resultant Trust, Routing**

I. INTRODUCTION

Mobile Ad hoc Networks are infrastructure less, self organizing and consists of dynamic topology. These networks will not have any centralized control. They usually forms with set of mobile nodes and exchange data dynamically with one another in the range of one hop directly [1]. In recent years, the widespread usage of cheaper and powerful wireless nodes for communication, mobile ad hoc networks have gained much more attention and emerged as most promising area [2]. Due to their growing importance because of their wireless medium, mobile ad hoc networks are used in many heterogeneous networks like Internet of things (IoT) that also includes other networks like wireless sensor networks, ad hoc networks and ZigBee. In present days, the usage of IoT devices has been increased significantly. The areas include homes, organizations, offices, industries etc.

In MANETs, all the nodes involved within the range of one hop can communicate directly and those nodes that do not fall within the range should depend on intermediate nodes for communication. Each node in the network can work as a intermediate node as well as terminal node, that means each node may generate the traffic while forwarding the packets of data received from source nodes to its neighboring nodes. The intermediate nodes has to dissipate their energy for forwarding others data packets. Due to the infrastructure less and dynamic topology, links between the nodes can change at faster mode and suddenly. Therefore, the nodes in a MANET have to help each other for transmission of data in multi hops.

Security is critical concern in MANET due to frequent connection interruptions, bandwidth and resource constraints, and high mobility of the wireless nodes. The nodes may behave selfishly and maliciously due to the energy constraints in forwarding other nodes packets as they have to use their own energy[3]. Another significant problem in MANETs is malicious nodes can wrongly drop or alter the packets contents. Due to this nature, packet transfer to the destinations can be interrupted, which in turn decreases packet delivery ratio, throughput and reliability [4]. Trust is augmented with Security. Trust can be used as important factor in providing secure transmission in Mobile ad hoc networks. Trust worthiness of all neighboring nodes should be evaluated well before involving them in any routing decision. Finding trustworthiness of a node is always a good measure to make sure the availability of the trusted and dependent nodes for secure path and to ensure secure communication between source and destination. Conventional procedures may not help in order to find such misbehaviors that occur randomly which causes threats to the network security. Trust-based Methods that involves in detecting and isolating untrusted and selfish nodes in MANETs, has been always treated as efficient measure to encounter the security threats caused by pernicious nodes[5].

In this paper, a novel and efficient security model based on trust that combines Direct trust values and Neighbor trust values is proposed. The direct trust value is evaluated through a quantifiable model by considering network parameters. Neighbor trust is calculated by taking into consideration the weights assigned to the neighbors depending on the distance. The proposed scheme combines direct observations of the node and recommendations from various neighbors collected for calculating final resultant trust. In order to provide good performance and trustable links for secure transmission of data, the proposed solution depends on the trust factor.

The remaining part of the paper is arranged as follows. Review of related literature work is presented in Section II. A trust model is proposed in Section III and Section IV shows results obtained through the simulation and shows the effectiveness of the proposed method in terms of performance metrics. Finally, Section

Ground Water Level Analysis & Prediction

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Abstract: Management of ground water in India always suffered with serious problems like extensive irrigation in major canal commands and overexploitation of groundwater for all purposes. Exhaustion of water tables, saltwater infringement, drying of aquifers, groundwater contamination, water logging and saltiness, etc. are major results of overexploitation and serious water systems.. In India, the highest category of groundwater is the irrigation field. This field uses almost 88 per cent of groundwater which in turn drastically decreases levels of groundwater. The goal of the proposed approach in such cases, is to predict groundwater levels based on inputs like history of groundwater and surface water level data, weather forecasts, usage of water, extraction of groundwater, other geographical data and target outputs which incindes groundwater level scenario.

Keywords: Central Ground Water Board, Receiver Operating Characteristic, MLE-Maximum Likelihood Estimation.

1. INTRODUCTION

Groundwater is the one available under Earth's surface in the layers of soil and in the cracks of rock layers. An aquifer is defined as the part of rock that yields a usable amount of water. A water table is called the depth at which the water availability in the soil or rock layers under the earth get saturated completely.. Groundwater gets recharged from the rainfall on the surface. It may dry out in the summer due to humid heat. Groundwater is extracted for agricultural, household, and industrial usages by means of digging and operating wells. The study involved in the extraction, movement and distribution of groundwater is hydrogeology[1].

Groundwater is freely available, more natural and less affected by vulnerabilities than surface water. That's why it is generally used for providing drinking water. As an example, among all the states of the United States, California extracts large amounts of groundwater annually as a part of usable water storage. In the US, Underground reservoirs are used for storing more water than all surface reservoirs and tanks, including the Great reservoirs. In general, many municipalities in India rely on groundwater availability for day to day water supply. Earth's freshwater is almost groundwater. Groundwater is the water that exists underneath the surface of the ground within the spaces between particles and layers of soil, or in holes, breaks and cracks in rocks. Usually groundwater is available not less than 100 meters of the surface of the Soil. Groundwater can contain numerous constituents counting microorganisms, gasses, inorganic and natural materials.

2. RELATED WORK

Groundwater Management in India is facing a lot of problems due to huge extraction and extensive irrigation. Saturation of water tables, increase in saltwater, dry out of aquifers, contamination of groundwater, non availability of water etc. are major consequences.. It has been detailed that in numerous parts of the nation the water table is declining at the rate of 1-2 m/year. At the same time in some areas, the water table rise is as huge as 1 m/year. Degrading the quality of groundwater by several reasons is another problem. Groundwater users of West Bengal become panic due to Increased arsenic content in shallow aquifers. Because of all these problems, the freshwater availability for all purposes like irrigation, industrial, municipal and domestic uses is reducing. Solution is to be provided for all these groundwater problems otherwise India will face a major water crisis in the near future. Looking into this situation, the Government of India has started various protective and useful measures to reduce the groundwater management issues. But the above measures do not create any impact because of political and administrative reasons and lack of awareness. Among all the countries across the world, India is the largest user of groundwater. Groundwater satisfies more than 50% of the total requirement of fresh water in the country. It withdraws more groundwater than the US and China - the next two biggest countries to pull groundwater – combined[2]. The central water resources standing committee identified that groundwater forms the major share of agriculture and drinking water supply in India in the year 2015. Irrigation occupies the major portion of the groundwater extraction which is about 89 per cent, marking it as the largest sector user in the country. Household usage sector becomes second in use of groundwater with 9 per cent. Next is the industry sector which uses only two per cent of it. Totally, groundwater satisfies 80 percent of rural domestic water supply and 55

Hybrid Secure Cloud Storage data based on improved Encryption Scheme

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Hybrid Secure Cloud Storage data based on improved Encryption Scheme

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***Abstract* - Cloud computing is a utility for data storage. Data storage security has become a primary challenge. The users can access, share &transacts the data as the cloud offers services based on the user demand. The Cloud data is originated from various sources, how secure the data is? Data security issues are increasing rapidly as data is flowing across the internet. To protect sensitive information there are many encryption techniques to hide the data from unauthenticated users. To secure the data encryption and decryption methods are used by which only authorized users can only retrieve the data. But sometimes Brute force method can recognize the hidden data. To enrich data confidentiality and authentication problems, a proposed method is used in which combination of AES and proxy re-encryption with Honey encryption is used. The system improves the data security for outsourced data. Honey encryption with hybrid cryptography can make unauthorized users to access only plausible looking messages.**

Keywords – Cryptography, Honey Encryption, AES, Proxy Re-encryption.

I. INTRODUCTION

Cloud computing proved to storage information with many users like organizations, government bodies and enterprises. As data consists of sensitive data security and privacy acts as a crucial role for hiding sensitive data with unauthorized parties. Many existing methods adopted for securing data in cloud but still there are many limitations. Researchers had developed algorithms to protect sensitive data such as posing with Access control and fine-grained like attribute-based encryption, identity-based encryption, homomorphic encryption, role-based encryption, proxy re-encryption, searchable encryption algorithms.[16]

As data is growing every user is storing the data in cloud storage. In which data consists of all personal sensitive data. Cloud providers should secure the sensitive data. For securing the data from unauthorized user's data should be encrypted before uploading into the cloud the data and the secret key will be only given to an authorized user.[6] Encryption methods are used to hide sensitive information from unauthorized users. Protecting private data by encrypting them and retrieve them only when a user has its key to decrypt it.[2]

In this paper, Honey Encryption is combined with AES and proxy Re-Encryption algorithm by which more security is provided to the sensitive data and improves data confidentiality and integrity. Combining two algorithms which give better security.

Honey Encryption is a way in which encrypted data is stored under a password using DTE. When an attacker tries to open with a wrong password doesn't allow him to open the correct data. It gives fake Honey terms looks like a real data. Thus, users who tries for guessing password to open the file will not be able to recognize whether given output data is correct or wrong data.[3]

II. RELATED WORK

To protect data from unauthorized users the common method used to hide data is used to encrypt the data before uploading into the cloud storage.[6] Many symmetric and asymmetric encryption algorithms are used for encryption. In which symmetric encryption is used with only on key at senders and receiver's side. Asymmetric keys are used with two keys one for encrypting with public key and another secret key I used for decrypting it.

For cloud storage proposed a combination of ABE and secret key with fine grained access control [15]ABE and proxy re-encryption provide more security to cloud data. PRE is a third-party server to re-encrypt the file again when the files are uploaded in encrypted format.[6]

To overcome the brute force attack from protecting sensitive information used Honey encryption. With the other encryption techniques, it has limitation with brute force method. Thanda. W et.al [4]. To find unauthorized users in online banking applications used Honey encryption SooF. T, et.al [5]. The proposed system explained about the hybrid encryption with fully homomorphic with additive RSA encryption. Zainab. H. M et.al [6]

According to symmetric encryption cloud storage is used by adopting multiple keys and file partition techniques Li et al. [16]. Proposed a method of "combined encryption with ABE and fine-grained access control in cloud storage data" [4]. In health applications ABE and PRE is used for securing sensitive information of a patient. In this method all health-related data is encrypted and re-encrypted using PRE [9]

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Role of Distance Measures in Approximate String Matching Algorithms for Face Recognition System

B. Krishnaveni & S. Sridhar

Conference paper | First Online: 20 November 2020

Part of the IFIP Advances in Information and Communication Technology book series (IFIPAICT,volume 578)

Abstract

This paper is based on the recognition of faces using string matching. The approximate string matching is a method for finding an approximate match of a pattern within a string. Exact matching is impracticable for a larger amount of data as it involves more time. Those issues can be solved by finding an approximate match rather than an exact match. This paper aims to experiment with the performance of approximation string matching

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Food Calorie Estimation System Using ImageAI with RetinaNet Feature Extraction

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Food Calorie Estimation System Using ImageAI with RetinaNet Feature Extraction

G. Kiran Kumar, D. Malathi Rani, K. Neeraja & Jeethu Philip

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Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 292)

Abstract

People across the world are being more health conscious in their weight, having a healthier diet and avoid obesity. A system that estimates calories and nutrition in food which can be differentiated depending upon its used ingredients can be very useful. So, we propose a system of design and implementation of food calorie estimation system using ImageAI which can recognize the food and gives the list of ingredients and measure of calories before consuming. We propose estimation of category of food type simultaneously along with the

Dr. Debashis De

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Deep Learning in IVF to Predict the Embryo Infertility from Blastocyst Images

Satya kiranmai Tadepalli ✉ & P. V. Lakshmi

Conference paper | First Online: 12 October 2020

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 698)

Abstract

In Vitro Fertilization (IVF) is used to solve infertility problem caused due to damaged, blocked, weak, total absence of fallopian tubes and issues in sperm or endometriosis. Successful IVF depends on assessment of embryo quality. In visual morphology, assessment produced by embryologists are different, as an outcome low success rate of IVF is seen. To develop the success rate multiple embryos are planted which lead to several pregnancies and complications. Artificial Intelligence (AI) method can be followed to analyze embryo quality apart from

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Instrument Recognition in Polyphonic Music Using Convolutional Recurrent Neural Networks

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Instrument Recognition in Polyphonic Music Using Convolutional Recurrent Neural Networks

Bhargav Ram Kilambi, Anantha Rohan Parankusham & Satya Kiranmai Tadepalli

Conference paper | First Online: 25 January 2021

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Abstract

Sounds or music usually occurs in an unstructured environment where their frequency varies from time to time. These temporal variations are one of the major problems in the music information retrieval. Additionally, polyphonic music or polyphony is simultaneous combination of two or more tones or melodic line, where each line is an independent melody of an instrument. As a result, identifying various instruments from recordings of polyphonic music is difficult and inaccurate using conventional

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Cloud-based Internet of things for Smart Water Consumption Monitoring System

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Cloud-based Internet of things for Smart Water Consumption Monitoring System

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Abstract - The levels at which groundwater is depleting around the world is alarming and there is an impending necessity to be judicious with water usage. This led to the formulation of a consolidated architecture to monitor water consumption at the household level. Internet of Things (IoT) is combined with the Thingspeak Cloud Computing platform and Android Studio to facilitate an efficient dashboard for consumers. The proposed model aims at imbibing a sense of responsibility in the citizens as it helps keep a track of water usage periodically using visually appealing charts, lays down the monthly water utility costs as well as provides tips with all in the form of a compact android application in their phones that is needed to be proactive and conserve resources. This paper presents a tested prototype and the pipeline connecting the hardware and software components responsible for streamlining the process of data transfer from IoT to cloud and from cloud to the android application. An overview of the promising technologies and frameworks that have been orchestrated in the development of the system as well as results obtained are thus provided.

Keywords - Water Consumption Monitoring System, Internet of Things(IoT), Thingspeak Cloud, Android Studio

I. INTRODUCTION

Water is one of the primary sources of survival for all life forms on earth. A lot of our day to day activities such as bathing, cooking, washing is dependent on the use of water. The community needs water for various activities beginning with the production of food [6] and irrigation. But now the world is heading towards a water crisis due to the excessive and uneconomical use of water by the large human population[8]. The World Economic Forum has announced in 2015 that the water crisis ranks the eighth global risk with the highest likelihood of occurring within 10 years[4]. This has left many fearing that the shortage of water is probably going to be the most important cause of conflict in the coming years[1]. The importance of groundwater conservation practices has undergone a gradual increase as it can lessen wastewater discharge which can further result in improved water quality. They also diminish the necessity to search for or create new water sources, leaving them in reserve for future use. Hence it is extremely important to conserve groundwater by constantly monitoring and regulating usage starting at the individual household level. The designated system strives to achieve just that. One of the main objectives of the system is to imbibe a sense of responsibility in the citizens by preaching the importance of water and its conservation. The monitoring dashboard provides tips for being conservative with the daily usage consumption and also allows them to set limits on the same. Once the limit is approached or has reached, the consumer receives an alert regarding the same, leaving room for usage reduction.

Some of the real-time applications of the system in the domestic/household-front include -

i. Track units of water consumed hourly/daily/weekly/monthly.
ii. View live analysis of consumption statistics in the form of interactive charts.
iii. Set limits on water consumption and receive alerts when the limit approaches or has reached.
iv. Receive monthly water utility cost bills and log reports based on the units consumed.
v. Be mindful of the usage by receiving tips on conservation timely.
vi. Educate residents as well as house help personnel.

The organization of the rest of the paper is as follows. Section II briefly overviews the technology involved

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A Review on Machine Learning Trends, Application and Challenges in Internet of Things

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Abstract: The rapid growth of the internet and its connecting devices makes the things connected to the entire world. In these days, the world is running on the internet of things (IoT), with the increased communication capability and most effective way of communication and transmission lines many of things are connected to the internet. The advent and revolution in smart sensor technology attracts many of the users and most of the devices are connected to the internet. Internet connected sensors and devices generate exponential data. Knowingly or unknowingly IoT is generating lots of data. This data is significant in decision making system, but the problem is how to segregate this data for the future analysis purposes. The Internet of Things (IoT) offers engineering teams an innovative way to collect data and observe the status of their products, services and equipment in the field. Machine learning techniques are used to learn from these data to make the device or thing intelligent. For example, using the machine learning identifying the abnormalities from our wearable and taking necessary actions like calling doctor and ambulance automatically when it necessary.

Keywords: machine learning, data analytics, Internet of things, smart city.

1. INTRODUCTION

The significance of automation of the industry makes the life of the person more comfortable and easy. With the advent technologies like artificial intelligence and machine learning makes the apathetic things likes computer, robot, mobile phone etc., are able to learn and intelligent. It has been anticipated that very soon all the different things that are going to be connected, that we are seeing around us. They are all going to be interconnected. Unification of technologies such as low-power embedded systems, big-data, cloud computing, machine learning and networking is required to enable the powerful technologies. The enormously generated data will be the biggest problem in these days, how can we utilized these generated data and what is the purpose of this data are the big questions. Fortunately, there is an emergent technology growing concurrently with the IoT that has the potential to stave off the hypoxia in these stagnant data lakes and instead turn them into a healthy ecosystem of usable information. By funneling big data into machine learning algorithms, engineers can breathe life into their development cycles, operations, manufacturing and more. In this work we are trying to identify the scope of the machine learning for IoT. The main challenges and trends of the machine learning techniques in deriving the knowledge for the IoT community to make the devices more automated.

The major share of the IoT comes from its connectivity, connecting anything, anytime anyplace, it make sure what is going to be observed in this new era of ubiquitous computing [3]. It makes the digital world, that is going to result in billions and trillions of things are connected. it means,

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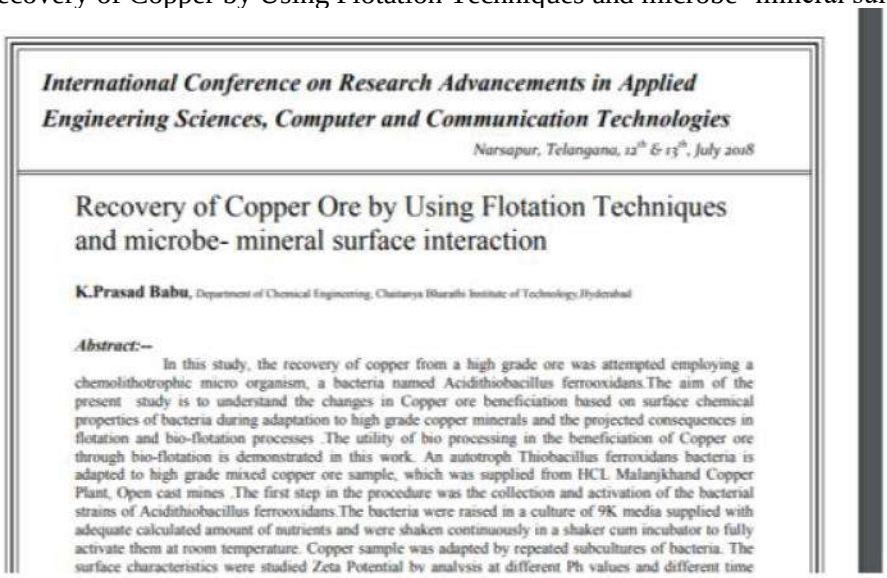
Recovery of Copper by Using Flotation Techniques and microbe- mineral surface interaction”



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Recovery of Copper Ore by Using Flotation Techniques and microbe- mineral surface interaction

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Abstract:--

In this study, the recovery of copper from a high grade ore was attempted employing a chemolithotrophic micro organism, a bacteria named Acidithiobacillus ferrooxidans.The aim of the present study is to understand the changes in Copper ore beneficiation based on surface chemical properties of bacteria during adaptation to high grade copper minerals and the projected consequences in flotation and bio-flotation processes .The utility of bio processing in the beneficiation of Copper ore through bio-flotation is demonstrated in this work. An autotroph Thiobacillus ferroxidans bacteria is adapted to high grade mixed copper ore sample, which was supplied from HCL Malanjkhand Copper Plant, Open cast mines .The first step in the procedure was the collection and activation of the bacterial strains of Acidithiobacillus ferrooxidans.The bacteria were raised in a culture of 9K media supplied with adequate calculated amount of nutrients and were shaken continuously in a shaker cum incubator to fully activate them at room temperature. Copper sample was adapted by repeated subcultures of bacteria. The surface characteristics were studied Zeta Potential by analysis at different Ph values and different time

" Effect of Amplitude Scintillations on the Tracking Error of IRNSS Receiver for Indoor Navigation Applications"

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Effect of Amplitude Scintillations on the Tracking Error of IRNSS Receiver for Indoor Navigation Applications

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***Abstract*— Indoor navigation has become increasingly important for various applications such as emergency services and consumer devices. The performance of Indian Regional Navigation Satellite System (IRNSS) receiver degrades in indoor environment due to attenuation of signal levels in addition to ionospheric scintillations. For indoor navigation applications such as position finding in a multi-story building, the effect of scintillation may result in the loss of lock signal rather than reduced accuracy. The objective of this paper is to investigate the effect of ionospheric scintillations on IRNSS receiver performance for indoor navigation by estimating the receiver phase lock loop (PLL) and Delay locked loop (DLL) tracking error variance (jitter). Our initial results indicate that severe scintillation could cause loss of lock.**

Keywords—DLL, Indoor position, Ionospheric scintillations, IRNSS, Jitter and PLL

I. INTRODUCTION

Indoor navigation has become increasingly important for various applications such as emergency services and consumer devices [1]. Global Navigation Satellite System (GNSS) comprises several satellite systems that can be used to locate the geographic location of a user's receiver anywhere in the world. GNSS receivers, using the GPS, GLONASS, Galileo or Beidou system along with regional systems are used in many navigational applications. Recently, the Indian Regional Navigation Satellite System (IRNSS) has become operational and is undergoing field trials for various applications. The satellite constellation consists of 3 geostationary and 4 geosynchronous satellites and operates in L and S band signals. Position finding of a person/fire in an indoor environment such as inside a multi-story building is very important. The IRNSS in combination with Geophysical Information System (GIS) is expected to give a very good position information in indoor environment. But, the quality of the IRNSS signals severely degrades in the indoor environment due to attenuation as much as 10 to 20dB introduced by the obstructions such as walls etc. In addition, several errors including ionospheric scintillations will further limit the performance of GNSS/IRNSS receiver [2]. Ionospheric scintillations are random rapid variations in the intensity and phase of received signals resulting from plasma density irregularities in the ionosphere [3][4]. Amplitude scintillation directly affects the carrier to noise ratio (C/No), as well as the noise levels in code and phase measurements [5][6]. Amplitude scintillation can be sufficiently severe that the received IRNSS signal intensity from a given satellite drops below the receivers tracking threshold, causing loss of lock on that satellite, and hence the need to re-acquire the IRNSS signals [7]. Therefore, research into the performance of IRNSS receiver in signal-degraded indoor environments under ionospheric scintillation is required.

II. TRACKING ERROR VARIANCE AT OUTPUT OF PLL FOR L5 BAND IRNSS

The carrier phase tracking error variance is often considered as an indicator of receiver performance. In the evaluation of receiver performance, one of the important parameters is the tracking threshold point[8]. This corresponds to the value where the PLL stops working stably and loses the lock and is given as,

$$\sigma_{\phi e/\lim}{}^2 = \left(\frac{\pi}{12}\right)^2 (rad)^2 \qquad (1)$$

Assuming no correlation between phase and amplitude scintillation, tracking error variance at the output of the PLL is expressed as,

$$\sigma_{\phi e}{}^2 = \sigma_{\phi S}{}^2 + \sigma_{\phi Th}{}^2 + \sigma_{\phi osc}{}^2 \qquad (2)$$

where $\sigma_{\phi S}{}^2$ is phase scintillation error component, $\sigma_{\phi Th}{}^2$ is the thermal noise component and $\sigma_{\phi osc}{}^2$ is the receiver oscillator noise. The receiver oscillator noise is assumed to have a standard deviation of 0.1 rad and it is ignored in this work. For the low latitude region like India, the values of $\sigma_{\phi S}{}^2$ are considerably low and well behaved [9].

Under normal ionosphere conditions thermal noise is the main factor causing tracking error. Under severe irregular ionospheric conditions, ionospheric scintillations become an

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"Design, Implementation and Performance Comparison of different Branch Predictors on Pipelined-CPU"

Design, Implementation and Performance Comparison of different Branch Predictors on Pipelined-CPU

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Abstract— **Branch predictors are implemented on pipelined CPUs having different types of instructions. Both unconditional and conditional branches are implemented utilizing different instruction set formats of the CPU. A basic pipelined CPU consists of three stages Fetch, Decode, and Execute. All the instructions are executed in parallel, hence every stage is busy with an instruction which saves the wastage of time and increases the performance. Hazards will occur because of Conditional branches in the pipeline which changes the sequential flow of execution. To overcome these hazards, the pipeline should be made empty and loaded with appropriate instruction which avoids the wastage of time. Hence Branch predictors are essential in CPUs as it saves the wastage of time by guessing the correct sequence of instruction as the conditional branches changes the sequence of instructions. Three types of Branch Predictors are implemented on pipelined CPUs separately which are simulated, synthesized and bit-files are generated using Xilinx ISE tool, the bit-files are later dumped on Xilinx SPARTAN-6 board and the results are analyzed using CHIPSCOPE.**

Keywords— Branch predictors; pipeline; CPU; Xilinx ISE; Xilinx SPARTAN; CHIPSCOPE.

I. INTRODUCTION

A Central Processing Unit (CPU) is an essential hardware within any computer that executes all the instructions of a computer program by performing the basic logical, arithmetical and input/output operations of the system. The two vital segments of a CPU are the arithmetic logic unit (ALU), which performs arithmetic and logical operations, and the control unit (CU), which extracts instructions from the memory then decodes and executes them, calling on the ALU when necessary [1]. An Intel core i7 processor is shown in Fig.1.

Pipelining is an implementation technique in which multiple instructions are processed at same instance of time [3]. It is the process of executing the instruction in an overlapped manner to increase the rate of flow of instructions, hence, improving the speed of a processor and reducing the number of cycles required to execute an instruction. The execution of an instruction will be done in three stages Fetch, Decode, Execute at consecutive three clock cycles together known as execution cycle or instruction cycle [10]. In Instruction pipeline there is no waiting of next instruction, the first stage in pipeline fetches the instruction and buffers it while the second stage is free. The first stage passes the buffered instruction to decode stage, while the second instruction is fetched in to the first stage (Fetch stage). When the first and second instructions are in Execute and Decode stages, the third instruction will be fetched into the Fetch stage and then it is send to the next succeeding stage, this process repeats. Since every stage is busy, it saves the wastage of time and enhances the overall performance of the CPU.

Nowadays every processor is implemented with pipeline to improve its performance, but a problem arises when there is a conditional branch instruction in pipeline. Consider a JUMP on carry (JC) instruction which will be known only in execution stage leading to a hazard in the pipeline as it fetches the wrong instruction from the memory, thereby, taking extra cycles to execute the JUMP instruction [7]. So, to overcome this hazard a concept of Branch Prediction circuit with different algorithms has been implemented on CPUs to predict JUMP instruction in Fetch stage so that the correct instruction is fetched in the next cycle, hence, saving the wastage of extra clock cycles.

Branch predictors are used to enhance the flow of the pipeline as it helps eliminating some of the stalls produced by the conditional branches by trying to guess if the branch is taken or not before leaving the fetch stage [8]. Implementation of the branch predictors with pipeline will increase the performance of the CPU when compared to the non-pipeline CPU, also when prediction rate is high it minimizes the miss rate and hence it avoids the wastage of time. There are several Branch Prediction algorithms such as ALWAYS NOT TAKEN, ALWAYS TAKEN, BINARY and DYNAMIC etc.

A. Hardware Requirements

1) Xilinx SPARTAN-6: An Atlys development board based on a Xilinx Spartan-6 LX45 FPGA, speed grade -3 and compatible with all the Xilinx freely available design tools, is used to test the accuracy of the design logic in real hardware environment [9].

2) Power adapter: Atlys board requires an external 5V, 4A with a coax center-positive 2.1mm internal-diameter plug, a suitable adapter is already provided as a part of the Atlys kit.

3) USB/JTAG cable: A standard USB type A/type B cable is used for communication between the host and the target system i.e., to dump the code and analyse its results.

"Selective Suppression of IRNSS S- band Signals for Specific Applications"

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Selective Suppression of IRNSS S-band Signals for Specific Applications

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***Abstract*— The Indian Regional Navigational Satellite System (IRNSS) has become operational recently. IRNSS S-band signals are more vulnerable to Radio Frequency Interference (RFI) as the S-band spectrum is congested with several other signals including the signals operating in the license free band. It operates in L5 and S1 frequencies. The performance of IRNSS receivers meant for non-precision applications can be enhanced by suppressing S1 signals. In view of this, an aluminium reflector is designed and developed to selectively suppress S1 signals. The results are encouraging.**

Keywords—IRNSS, S- band, RF Interference

I. INTRODUCTION

Global Positioning System (GPS) is an already established space-based navigation system, with applications in diversified fields of science and engineering [1]. However, the Indian Regional Navigation Satellite System (IRNSS) is an emerging satellite based navigation system providing an independent positioning and timing service over Indian land mass and about 1500 Kms from the mainland [2]. IRNSS is designed, developed and controlled by the Indian Space Research Organization (ISRO). The IRNSS satellite constellation consists of 4 satellites (IRNSS 1A, 1B, 1D, 1E) in inclined geosynchronous orbits and three in Geostationary Earth Orbit (IRNSS 1C, 1F, 1G). In contrast to other satellite constellations which use only L-band frequencies, IRNSS uses both L-band (1164.45 – 1188.45 MHz) and S-band (2483.5-2500MHz) signals [3]. The use of these bands compared to C band gives acceptable received signal power with reasonable satellite transmit power levels, and less ionospheric delay and fluctuation in delay, compared to UHF [4]. Several researchers have investigated various aspects of IRNSS such as ephemeris errors even before the constellation became fully operational [5], [6]. IRNSS has been operational since June 2016. Under an MOU between SAC,ISRO, India and CBIT, Hyderabad, India two IRNSS receivers were installed at CBIT (17.39° N, 78.31° E). Since then several field trials on the receiver are being carried out. This paper investigates the robustness of IRNSS signals which are subject to interference from S-band terrestrial sources like Wi-Fi, Bluetooth, Zigbee etc. operating in the license free band of 2.4 GHz. For several general, day to day and non-precision applications, single frequency IRNSS receivers can be used. For such applications, S-band signal interference is detrimental and compromises the position accuracy. Therefore, in this paper it is proposed to design and develop an aluminium reflector plate at S1 frequencies to avoid interference and improve the receiver performance.

II. DESIGN OF ALLUMINRUM REFLECTOR FOR IRNSS RECEIVER

Antennas are an essential part of any navigation system. Its performance can be evaluated by measuring several parameters such as gain, bandwidth, phase centre etc. [6]. Using reflectors, antenna performance can be either degraded or enhanced depending upon the applications. In this paper, an aluminium reflector plate is used to selectively suppress the S-band signals, the details of which are discussed in this section.

A. Basic Analysis

To investigate the robustness of IRNSS signals, it is proposed to study the penetration capability of the signals through a reflector. For this an aluminium plate is used as a reflector positioned in the line of sight path between satellite and receiver antenna. To decide the position and orientation of reflector plate near the receiver antenna, the azimuth and elevation information of the IRNSS satellites is determined. Geostationary satellites have minimum variation of position with respect to earth station. Hence reflector position calculation is done for IRNSS 1G. The azimuth and elevation variations are found to be 97.5° – 109° and 26.9° - 51°. Even though originally it was planned to launch 1G satellite as a geostationary satellite, later it was given an inclination of 5° to improve dilution of precision. Therefore, such a variation in azimuth and elevation is seen for this satellite.

A square reflector plate of dimensions 0.25m x 0.25m and thickness (t) 0.254mm (10mil) (justification of these values can be found in part II B, Calculation of Reflector Design Parameters) is placed in LOS path of IRNSS 1G signal as shown in Fig. 1. The reflector plate is mounted on a tripod whose height can be varied easily. Also a provision is made to rotate the plate both in horizontal and vertical direction. The distance from the antenna to the reflector is also variable. The penetration depth (δ) of such a plate is computed as [7],

$$\delta = \sqrt{\frac{\rho}{\pi f \mu}} \qquad (1)$$

Where ρ, the resistivity of the aluminium is 2.6548×10^{-8} Ω-m, f is the frequency in Hertz, μ is the absolute magnetic permeability of the conductor ($\mu_o \times \mu_r$), μ_o is $4\pi \times 10^{-7}$ H/m, μ_r is 1.00002 [8]. δ is 2.3908μm at 1176.45 MHz and 1.6427 μm

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"Video Enhancement Using Contrast Limited Adaptive Histogram Equalization"

"RLG Dither signal removal using wavelet transforms",

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RLG Dither Removal Us ing Wavelet Transforms

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Abstract— **Ring Laser Gyroscopes (RLGs) are widely used in many airborne and navigation systems for accurate measurement of the true rotation of the body movement. But the RLG's suffer a serious problem at low frequencies known as Lock –in frequency. To avoid lock-in problem, the RLG is vibrated mechanically to a high frequency which is known as Dithering. In order to get the true rotation of the body the dither signal has to be removed. Single stage, multistage and multirate filters are suggested to remove the dither signal. These filters have the disadvantage that either the FIR filter length is too large or the phase characteristics are not linear. In this work multiresolution techniques using Wavelet Transforms (WTs) are used to remove the dither signal. Six level multi resolution analysis is carried out with various types of wavelets like Discrete Meyer and Daubechies 45 (db45) etc. With none of the standard wavelets, the original and reconstructed signals are matched. A new wavelet is designed to remove the dither signal. The required signal can be constructed back using the approximation coefficients at level 6. The dither signal is attenuated by 265 dB, and the phase characteristics are found to be linear in the pass band. The computational complexity is also less compared to the three stage combined filter reported earlier.**

***Keywords*—Ring Laser Gyroscope, Multiresolution.**

I.INTRODUCTION

Gyroscope is basically a rotation sensor which is used to measure the absolute angular rotation of any rotating system. This instrument is an essential requirement for navigation and control of a moving vehicle. The advantage of RLG is that it is less sensitive to environmental conditions and its performance does not depend on gravity of the earth 'g'. It is also less sensitive to thermal conditions and magnitude fields. Hence it is more accurate and more stable.

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"Investigation of Anomalous Ionospheric Gradient Effects on the Performance of Indian GBAS"

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Investigation of Anomalous Ionospheric Gradient Effects on the Performance of Indian GBAS

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***Abstract*— Ground Based Augmentation Systems (GBAS) ensure safe low-visibility aircraft landings at suitably equipped airports. Low latitude ionosphere characterized by ionospheric irregularities and anomalous gradients pose a severe threat to the performance of Indian GBAS. No significant work has been reported on the range and position domain errors introduced by severe gradients identified at low-latitude stations. In this paper, extensive analysis of range domain errors, induced by anomalous gradients is carried out. From the analysis carried out in this work, it is observed that PRN affected by gradient of 460 mm/km induced range error of 8.11m. For other PRNs the error is only upto 2.3m.**

***Keywords*— Ground Based Augmentation Systems, ionospheric gradients, differential range error.**

I. INTRODUCTION

GBAS is a 21st-century safety-critical system capable of supporting aircraft PA and landing even in low visibility conditions. GBAS provides an assured accuracy, availability and integrity initially to Category I PA, and eventually to CAT II, and III PAs [1] [2]. To achieve such high accuracy levels, the Ground Facility computes a single pseudorange correction for each satellite and transmits the corrections to all the users in the service volume. The single correction accounts for all common errors (atmospheric and satellite based errors) between the Ground Facility and the user and hence these errors can be completely eliminated when user applies differential corrections. Errors that are not identical at Ground Facility and the user cannot be cancelled out with differential corrections and cause residual errors at the user. GBAS users compute the bounds on residual errors (called protection levels), with the help of the error sigmas broadcast by the Ground Facility. The residual error that is most challenging to GBAS users is the ionospheric spatial decorrelation error. This error builds up due to the fact that ionosphere exhibits spatial variations, and hence the delays experienced by the Ground Facility and the user are different, giving rise to spatial gradients of ionospheric delay between the two. The spatial gradients are extremely large (of the order of hundreds of mm/km) under ionospheric storm conditions [3]. Several researchers investigated the aspect of large gradients at mid-latitudes ([4]; [5]; [6]; [7]). The impact of such large gradients on GBAS performance has also been investigated ([8]; [9]). At low latitudes, Srinivas et al., [10] analyzed the GPS data of two stations namely National Geophysical Research Institute (NGRI), Hyderabad (17.41°N, 78.55°E) and Research and Training Unit for Navigational Electronics (NERTU) of Hyderabad (17.44°N , 78.47°E). Based on the available data, data of four years (from 2008 to 2012) is analyzed and gradients as large as 300-460 mm/km were observed. Such anomalous gradients induce not only large range errors but also vertical position errors. Range errors induced by large gradients are computed in this paper.

II. ANOMALOUS IONOSPHERIC GRADIENTS AND THEIR EFFECTS ON LAAS

Under normal conditions, ionosphere over equatorial and low latitude regions is characterized by high spatial variation of ionospheric delays. Abnormal solar events like Coronal Mass Ejections from the Sun produces large ionospheric delays and large gradients of the order of hundreds of mm/km. Such large gradients introduce several meters of error in range domain. The ionosphere induced error in range domain is called Differential Range Error (DRE (ε)) and it is directly proportional to the ionospheric gradient amplitude (g_i), for a given separation distance between the LGF and the user (x) [11] (Eqn.1).

$$\varepsilon = \min\left[\frac{50}{W_{\_\_}}, \max(g_i)\right] \times \left(x + 2\tau_s v_{aircraft}\right) \quad \text{(m)} \qquad (1)$$

Where

$W_{\_\_}$ is the width of the ionospheric front (km)

τ_s is the time-constant of the smoothing filter (100s)

$V_{aircraft}$ is the velocity of the aircraft (0.07 km/s)

III. METHODOLOGY

Initially, the dependence of DRE on key parameters such as x and g_i is analyzed. Later, DRE is computed for all the satellites commonly visible between NGRI and NERTU stations on a quiet day (8th March 2012 (1<Kp<5)). Finally, the DRE due to anomalous gradient of the order of 460 mm/km observed between the two stations on a storm day (09 March 2012 (2<Kp<8)) is estimated.

IV. RESULTS AND DISCUSSION

Fig. 1 shows the simulation result of DRE variation with respect to distance between the LGF and user (x). For a given value of gradient, x is varied from 1 km to 45 km (GBAS applicable distances). It is observed that DRE value increased linearly with distance and reached a value as much as 30 m, when the separation is 45 km. Also, the variations in DRE values are directly proportional to the magnitude of the gradient (g_i).

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“Investigation on Performance of Distributed Autonomous Sensors on Embedded Platforms”

Investigation on Performance of Distributed Autonomous Sensors on Embedded Platforms

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M Rajendra Prasad ; B Santosh Pawan Kumar ; A Swarnamani ; A Lahari ; P Prathyusha ; D Krishna Reddy All Authors

Abstract:
A node is an intersection point that can generate, receive, store or transmit data along distributed network routes and allows us to analyze the data at a particular point. In a network node, each sensor has several parts such as transceiver with an internal or connection to an external antenna, micro controller, electronic circuits for interfacing sensors and energy source. The scaling of single node cluster has a limitation of CPU computational powers, maximum memory and number of processes that can run on a single machine. In order to overcome these limitations multi node clusters are needed. To process huge amount of data at the same timeframe, multi node clusters are used. To monitor environment and physical conditions such as temperature, ambient light etc. and to cooperatively pass their data through network to a main location a distributed autonomous sensor called Wireless Sensor Networks (WSN) are used. WSN is a low-cost technology which is built of nodes from few to several hundred or thousands where each node is connected to single or several sensors. It acts like a bridge between virtual and real world. Besides, using a single platform for WSN, the proposed work send and receive the data on different platforms like FRDM-KL25Z, and Arduino Uno using WSN Multiple Nodes. A novel methodology is developed to create a node, transmit the data from the sensor through the created node, calculation of time to transmit and receive data through the nodes and comparing the network latencies.

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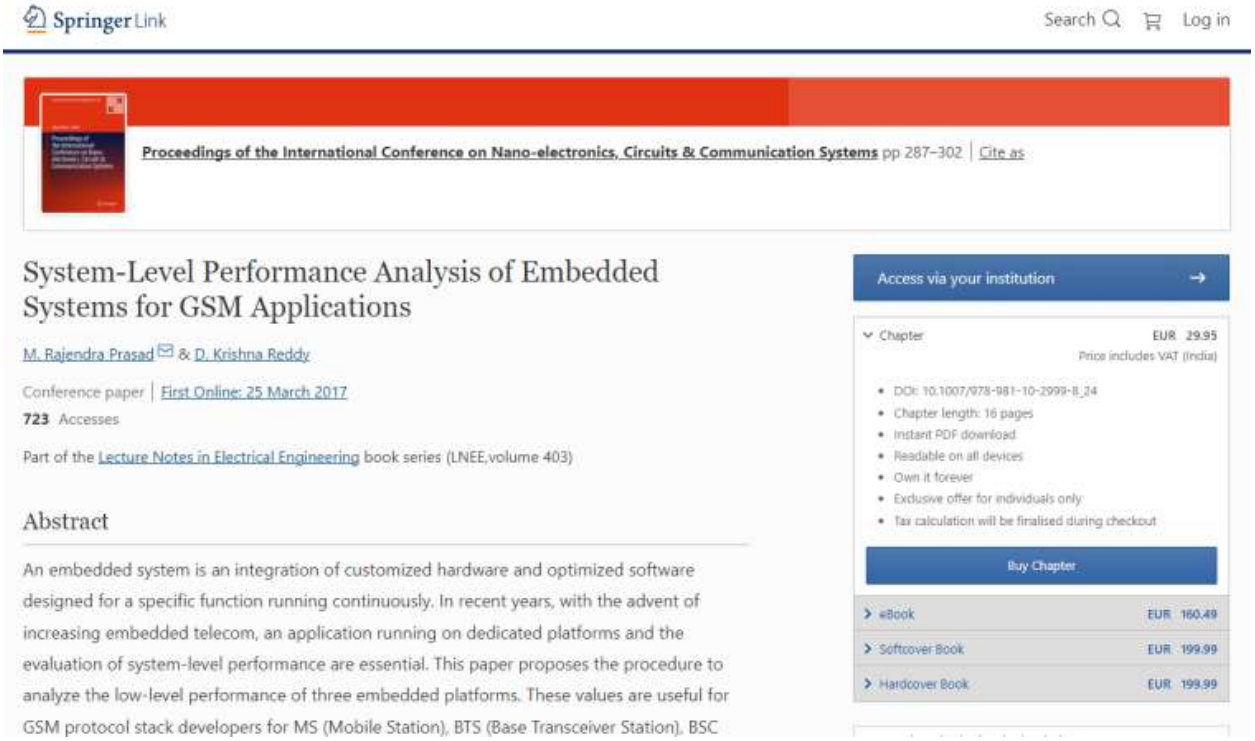
"System Level Performance Analysis of Embedded System for GSM Applications"



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System-Level Performance Analysis of Embedded Systems for GSM Applications

M. Rajendra Prasad & D. Krishna Reddy

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Abstract

An embedded system is an integration of customized hardware and optimized software designed for a specific function running continuously. In recent years, with the advent of increasing embedded telecom, an application running on dedicated platforms and the evaluation of system-level performance are essential. This paper proposes the procedure to analyze the low-level performance of three embedded platforms. These values are useful for GSM protocol stack developers for MS (Mobile Station), BTS (Base Transceiver Station), BSC

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"Development of System Level Computational Platform for IP- BTS Telecom Application"

Development of System Level Computational Platform for IP-BTS Telecom Application

Publisher: IEEE Cite This PDF

M. Rajendra Prasad ; D. Krishna Reddy All Authors

Abstract:
IP-BTS (Internet Protocol Based Base Transceiver Station) is a small computing hardware module designed for integration into an industry standard tower PC housing which provides a complete GSM Access Point. It is used to optimize cost of transmission line for high density multi-band base stations. This paper describes the detailed procedure to develop system level boot loader software (universal boot loader-u-boot) for IP-BTS which is a customized hardware with PowerPC based processor board running on RTLinux operating system. This paper also discusses the brief presentation of the customized hardware platform at system level and the boot loader software development procedure for embedded telecom application IP-BTS. Designing suitable boot software at system or boot level is a complex and challenging task which is included in development of an embedded system for telecom applications. The boot loader connects application software through customized hardware and Real-Time Operating System (RTOS). It is not only responsible for initialization of the processor board and other module of IP-BTS software also upgrades operating system images and IP-BTS software versions. The early initialization code is always developed in the processor's native assembly language. In this paper we presented detailed procedure to transplant boot loader (u-boot) on Power PC based customized board and tested successfully with results.

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Extraction Of Cellulose Nano Fibers And Development Of Nano Cellulose Fiber Composites - A Review,

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EXTRACTION OF CELLULOSE NANO FIBERS AND DEVELOPMENT OF NANO CELLULOSE FIBER COMPOSITES - A REVIEW

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***Abstract*- Natural fibers are abundantly available in nature at a low cost and have the main advantage of being biodegradable. They have low density and high toughness. The structure of natural fiber consists of cellulose crystals surrounded by hemi-celluloses and lignin. Lignin is the glue like substance that binds all the component of the fiber. Strength of the fiber is mainly due to the pure crystalline structure of the cellulose. Various plant sources like, kenaf, jute, flax, hemp, sisal, okra, banana and Roselle are used to produce nano cellulose fibers. The natural fibers are subjected to a sequence of treatments like, alkaline treatment, bleaching, cryo crushing, grinding, high pressure homogenization, acid hydrolysis, ultra-sonication, TEMPO-mediated oxidation, steam explosion, etc. These treatments yield cellulose fibers of three grades such as, micro-fibrillated cellulose, nano crystalline cellulose and bacterial nano cellulose. The fibers obtained in each stage are characterized for their chemical composition. The cellulose nano fiber composites are made using various biodegradable polymers such as, poly lactic acid, thermoplastic starch and poly hydroxyalkanoate (PHAS), poly vinyl alcohol (PVA) and poly esteramide. Partially degradable nano cellulose composites are made using polypropylene, polyester, polyethylene resins are used for making variety of components for domestic, automobile, optical sensors, electronic devices, structural, medical, textile, paint, paper board and packaging industry and also for hygiene products, cosmetics. In this paper, the status of research on extraction of nano cellulose fibers and various processes involved and type of materials employed for making the nano cellulose products are presented focusing the scope for further research and development of nano cellulose composites.**

Keywords: Nano cellulose fibers, biodegradable nano cellulose composites, nano cellulose composites for packaging, electronics and cosmetic industry.

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I. INTRODUCTION

Due to the increased attention on the issues related to degradation of environment, there has been a great demand in the recent years from all sections of the society for the biodegradable and environmental friendly products from sustainable resources [1, 2]. Such products are developed using various biodegradable resins such as, poly lactic acid, thermoplastic starch and poly hydroxyl alkanoates (PHAS), poly vinyl alcohol (PVA) and poly ester amide along with natural fibers [3]. Nano cellulose composites are made using polypropylene, polyester, polyethylene resins and modified starch. Cellulose fibers derived from various plant sources are used extensively in textile, paper and cosmetic industries. In the recent years, nano cellulose products are used as an alternative to plastics to avoid detrimental effects of plastic products. Various natural fibers being used in raw form or in modified form for different applications are presented in Fig.1. The structural elements of natural fibers such as lignin, pectin, hemicelluloses and cellulose are described in sections II and III. Different stages of extraction of nano cellulose fibers are presented in sections IV. Development of nano cellulose composites and their applications are presented in sections V and VI respectively.

Effect of plan shape on the wind pressures on buildings: A CFD Approach

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Effect of Plan Shape on the Wind Pressures Onbuildings- A CFD Approach

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***Abstract*-- Lateral loads i.e. wind load, seismic load, govern the design of tall buildings and their computation is of paramount importance for the efficient analysis of structures. For very tall buildings, wind loads are more predominant than seismic loads and the present wind load code IS 875 (PART-3) provides provisions for design pressure and force coefficients for some standard shapes. But with the present trend of adopting complex geometries for buildings, the present specifications are inadequate for the computation of wind loads. For such cases, wind tunnel testing, which is required to generate equivalent atmospheric turbulence properties and boundary layer flow inside the wind tunnel can be adopted, but is too costly and time consuming. In such a scenario, computational fluid dynamics, an analytical tool comes handy and provides a reasonable and economical solution.**

Computational Fluid Dynamics, popularly known as CFD, basically involves obtaining numerical solution for the fluid problems often governed by Navier Stoke equations. It needs high speed computing systems and efficient algorithms. In the present work, an attempt is made to predict the wind pressures on buildings of various shapes with various floor heights and make a comparative study. K-epsilon turbulence model is considered for the analysis and software ANSYS - FLUENT is used for CFD analysis.

***Keywords*-- Computational fluid dynamics (CFD), Boundary layer, K-epsilon, UDF- Velocity profile.**

I. Introduction

Wind is a phenomenon of great complexity because of the many flow situations arising from the interaction of wind with structures. Wind is composed of a multitude of eddies of varying sizes and rotational characteristics carried along in a general stream of air moving relative to the earth's surface. These eddies give wind its gusty or turbulent character. The gustiness of strong winds in the lower levels of the atmosphere largely arises from interaction with surface features. The average wind speed over a time period of the order of ten minutes or more tends to increase with height, while the gustiness tends to decrease with height.

The characteristics of wind pressures on a structure are a function of the characteristics of the approaching wind, the geometry of the structure under consideration, and the geometry and proximity of the structures upwind. The pressures are not steady, but highly fluctuating, partly as a result of the gustiness of the wind, but also because of local vortex shedding at the edges of the structures themselves. The fluctuating pressures can result in fatigue damage to structures, and in dynamic excitation, if the structure happens to be dynamically wind sensitive. The pressures are also not uniformly distributed over the surface of the structure, but vary with position.

The purpose of the present study is to investigate the dynamic behaviour of tall structures of various shapes when subjected to wind. For the simulation part domain size and mesh size influences the accuracy of the result. The boundary conditions and wall condition around the bluff body should be considered. The main focus of the present study is to reduce the unsteadiness of wake region around the structure, which creates high pressures, by considering the appropriate shape of the structure. Aerodynamic forces on tall building models with same area were using the pressure contours generated on various faces of models are calculated. [3]

II. Outline Of Models Considered

A. Configuration of tall building models:

The tall buildings used for the experiments are square, circle, ellipse and parabolic shapes. The pressure contours are generated for various angles of attacks like 0, 90 and 180. The height of the structures considered are 150m, 195m and 240m.Selection of models were based on the aerodynamic nature of the buildings.

B. Computational Fluid Dynamics

Computational fluid dynamics (CFD) is a branch of fluid mechanics that uses numerical analysis and algorithms to solve and analyse problems that involve fluid flows.

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Department of Civil Engineering, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad
December 15-16, 2017

EFFECT OF RECYCLED AGGREGATE ON FRESH AND HARDENED STATE PROPERTIES OF SELF-COMPACTING CONCRETE

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Abstract

Concrete is the most widely used construction material in which Aggregates take maximum share. This poses the problem of acute shortage of aggregate and scouring of Granite Quarry. At the same time, the quantity of recycled Concrete aggregates from old Construction Demolished waste is piling up in many areas. If it is possible to use this RCA in fresh concrete by partial/complete replacement of Natural Coarse aggregates, then this will not only save the cost of construction at the same time it will solve the problem of disposal of this CDW waste. Therefore, the objective of this research work is to develop sustainable self Compacting Concrete (SCC) of various grades using Recycled Concrete Aggregate (RCA), fly ash etc. This paper discusses the fresh and hardened state properties of SCC of M30 grade using Natural and Recycled Concrete Aggregates. Quantification and Characterization was done using Modified Nan Su Mix design analysis.

Keywords: *Self Compacting Concrete (SCC), Recycled concrete aggregates (RCA), Fresh Properties, Mechanical Properties, Modified Nan Su Method.*

Introduction

The term Self-Compacting Concrete (SCC) refers to a "new" special type of concrete mixture, characterized by high resistance to segregation that can be cast without compaction or vibration. It flows like "honey", de-aerates, self-compacts, and has nearly a horizontal concrete level after placing. Products made with SCC have an excellent finish, and are virtually free of bug holes The basic components of the mix composition of SCC are the same as those used in conventional concrete. However, to obtain the requested properties of fresh concrete in SCC, a higher proportion of ultrafine materials and the incorporation of chemical admixtures, particularly an effective superplasticizer, are necessary. Because of this, self-compatibility can be largely affected by the characteristics of materials and mix proportion. No standard or all-encapsulating method for determining mixture proportions currently exists for SCC. However, many different proportion limits have been listed in various publications. Therefore, a rational mix-design method for NASCC and RASCC using variety of materials is necessary. The proposed Modified Nan Su Mix design of SCC must satisfy the criteria on filling ability, pass ability and segregation resistance.

Mix Design Method: Initially EFNARC first approach for Modified Nan Su Mix design is used, and then the proportions of materials modified after the evaluation by fresh tests was done. The modifications are made according to EFNARC guidelines.

Sustainable Design: Sustainability in general terms is to create an economic system with enhanced performance with long term safety. Sustainability is the one which mainly focuses

Studies on strength characteristics of Self-curing concrete

Proceedings of National Conference on Recent Innovations in Civil Engineering (RICE 2017)
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STUDIES ON STRENGTH CHARACTERISTICS OF SELF-CURING CONCRETE

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Abstract
Today concrete is most widely used construction material due to its good compressive strength and durability. Depending upon the nature of work the cement, fine aggregate, coarse aggregate and water are mixed in specific proportions to produce plain concrete. Plain concrete needs congenial atmosphere by providing moisture for a minimum period of 28 days for good hydration and to attain desired strength. Any laxity in curing will badly affect the strength and durability of concrete. Self-curing concrete is one of the special concretes in mitigating insufficient curing due to human negligence paucity of water in arid areas, inaccessibility of structures in difficult terrains and in areas where the presence of fluorides in water will badly affect the characteristics of concrete. The present study involves the use of shrinkage reducing admixture polyethylene glycol (PEG 400) in concrete which helps in self-curing and helps in better hydration and hence strength. In the present study, the effect of admixture (PEG 400) on compressive strength, split tensile strength and modulus of rupture by varying the percentage of PEG by weight of cement from 0% to 2% were studied both for M20 and M40 mixes. It was found that PEG 400 could help in self-curing by giving strength on par with conventional curing. It was also found that 1% of PEG 400 by weight of cement was optimum for M20, while 0.5 % was optimum for M40 grade concretes for achieving maximum strength without compromizing workability.

Index Terms: *Self-curing concrete; Water retention; Relative humidity; Hydration; Absorption; Permeable pores; Sorptivity; Water permeability*

1. INTRODUCTION

Proper curing of concrete structures is important to meet performance and durability requirements. In conventional curing this is achieved by external curing applied after mixing, placing and finishing. Self-curing or internal curing is a technique that can be used to provide additional moisture in concrete for more effective hydration of cement and reduced self-desiccation.

1.1 Methods of self curing

Currently, there are two major methods available for internal curing of concrete. The first method uses saturated porous lightweight aggregate (LWA) in order to supply an internal source of water, which can replace the water consumed by chemical shrinkage during cement hydration. The second method uses poly-ethylene glycol (PEG) which reduces the evaporation of water from the surface of concrete and also helps in water retention.

1.2 Mechanism of Internal Curing

Continuous evaporation of moisture takes place from an exposed surface due to the difference in chemical potentials (free energy) between the vapour and liquid phases. The polymers added in the mix mainly form hydrogen bonds with water molecules and reduce the chemical potential of

Object classification using SIFT algorithm and transformation techniques

Cognitive Informatics and Soft Computing pp 403–408

Object Classification Using SIFT Algorithm and Transformation Techniques

T. R. Vijaya Lakshmi & Ch. Venkata Krishna Reddy

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Abstract

Recognition of objects, as well as identification and localization of three dimensional environments is a part of computer vision. In the proposed study the objects in a war field are classified. Images extracted from the video stream are utilized to classify the objects of interest (soldier, tree and tank). Distinguishable features of the objects are extracted and these features are used to identify and classify the objects. The SIFT algorithm used to find the features from such images are processed to classify the objects such as soldier, tank, tree, etc. The key

Dr. Ahmed F. Zobaa

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Probabilistic Analysis of Partial Discharge in Power Transformer due to the Presence of Spherical Particle

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Probabilistic Analysis of Partial Discharge in Power Transformer due to the Presence of Spherical Particle

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***Abstract*:- The paper deals with the partial discharge in a power transformer due to presence of metallic particle in a transformer oil or mineral oil. A conducting particle is assumed to be present in the oil, between High Voltage (HV) winding and pressboard inner cylinder gap. It is assumed that particle moves in random direction along with the transformer oil. Probabilities of Partial Discharge (PD) have been calculated by assuming various field intensification factor β and threshold voltages. Simulations have been carried out to find the probability of partial discharge at different oil velocities. Results of this paper show that the probability for the occurrence of partial discharge varies with respect to field intensification factor β, threshold voltage and velocity of the oil, as particle is also assumed to move with the same velocity of oil. It is observed that probability of PD increases with β for a given threshold voltage.**

Keywords:- Power transformer, Partial discharge, Field intensification factor, Particle movement

I. INTRODUCTION

New technologies are being introduced gradually in the area of power generation, transmission and distribution. It is required to step up and step down the voltages to make it available as per necessity. Higher voltage rating power transformers have been developed and employed for transmission of larger power to longer distances. Consequently, the demand on insulation also increases. In addition, phenomenon associated with voltage stress and PD becomes more predominant at relatively higher voltages. Thus preventing partial discharges at these voltages becomes a challenging task. The most common cause for failure of power transformer is found to be due to partial discharge in the transformer. Although PD is allowed up to 250 Pico- Coulombs (pC) as per standard at the test voltage, it becomes difficult to limit at sharp corners and curvatures of the conductors. As a result the above value exceeds at this voltage.

PD can occur due to the presence of particles, which are conducting in nature moving along with the transformer oil. A work by Ward et al [1] shows the impact on field intensification factor at the particle and its influence in breakdown analysis. Hu Yue et al [2] proposed a method to find the location of partial discharge using Monte-Carlo simulation. Van Brunt and Cernyar [3] simulated AC generated discharge pulses using Monte-Carlo technique and found that results are similar to the experimental results. M.Hikita et al [4] carried out a Monte-Carlo simulation to generate the PD distributions and proposed a model for PD mechanism. Rain and Tabazeon [5] experimented with the breakdown mechanism of liquid insulation in the presence of free and fixed particle and represented that breakdown occurs at lower voltage when the particles are free. Mishra et al [6] measured Partial Discharge activity in GIS with the presence of AC voltages and at various pressure levels.

A 100 MVA 11/132/220 kV auto transformer is considered for analysis. This transformer has three windings, viz. low voltage (LV), Intermediate voltage (IV) and High Voltage (HV). For the present analysis only HV winding is only considered because it provides an onerous condition for initiation of Partial Discharge.

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A solution to the Multi-objective Optimization Problem with FACTS devices using NSHCSA including practical constraints

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A Solution to the Multi-Objective Optimization Problem with FACTS Devices using NSHCSA Including Practical Constraints

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***Abstract*— Optimal Power Flow (OPF) with FACTS devices place a vital role in power systems. In this paper, a proposed Non-dominated Sorting Hybrid Cuckoo Search Algorithm (NSHCSA) for multi objective optimal power flow problem with series FACTS devices namely Static Synchronous Series Compensator (SSSC) and Interline Power Flow Controller (IPFC) with different objective functions including the practical constraints, operating constraints and the installation cost of FACTS devices are considered for this analysis. Some heuristic rules are suggested for the optimal location of FACTS devices to reduce the number of possible locations. Cuckoo Search Algorithm (CSA) and Genetic Algorithm (GA) are combined to form the proposed Hybrid Cuckoo Search Algorithm (HCSA). The fuzzy decision making tool is used to select optimal Pareto front solution for multi objectives. The effectiveness of the proposed method is tested on IEEE-30 bus test system with FACTS devices. The results are analyzed and compared with existing methods.**

***Index Terms*— Hybrid cuckoo search algorithm; Multi objective optimization; Pareto solution; Location of FACTS device; Device installation cost; Non-dominated Sorting; power system severity.**

I. INTRODUCTION

The latest FACTS devices are unified power flow controller (UPFC) and interline power flow controller. In the past, much effort has been made in the modeling of the UPFC for power flow analysis [1, 2]. UPFC compensate a single transmission line, whereas the IPFC is used for the compensation and power flow control of multi-line transmission system. Like the static compensator (STATCOM), SSSC and UPFC, the IPFC employs the voltage sourced converter (VSC) as a basic building block reported by L. Gyugyi et al. [3]. A steady state control of power system parameters with current and voltage operating constraints has been presented by X.P.Zhang [4] in which it uses a multi control functional model of SSSC. Mathematical models of generalized unified power flow controller (GUPFC), IPFC and their implementation in Newton power flow are described by X.P.Zhang [5] to demonstrate the performance of GUPFC and IPFC.

S. Teerathana et al. [6] proposed OPF method with IPFC to solve load flow problem and the power and the power generation with the minimum cost. An injection model for congestion management and total active power loss minimization in electric power system was developed Jun Zhang and Akihiko Yokoyama [7]. A current based model of SSSC and IPFC has developed by Vinkovic A and Mihalic R [8, 9]. Ramin Rajabioun [10] proposed a novel evolutionary algorithm cuckoo optimization algorithm, suitable for continuous nonlinear optimization problems. Xin-She Yang et.al [11], initiated to formulate a new meta-heuristic algorithm, called cuckoo search algorithm for solving optimization problems.

The study of the former literature reveals that all the FACTS devices incorporated for power flow management of single transmission line. But, this paper describes the performance of a multi-line FACTS device which is IPFC. A mathematical model of IPFC which is commonly known as IPFC power injection model has presented. In this paper while understanding the impact of IPFC on power system networks this model is very much useful. IPFC power injection model is associated with Newton-Raphson (NR) power flow solution method to study the effects of IPFC parameters in power flow studies. Numerical analysis is carried out on IEEE 30 bus system to demonstrate the performance of the IPFC model.

From the above literature, it is observed that the OPF problem is solved using different techniques without considering the practical constraints such as ramp rate limits, Prohibited Operating Zones (POZ) and the installation cost of FACTS devices. In this paper a non-dominated sorting hybrid cuckoo search algorithm to find the solution of multi objective optimal power flow problem in the presence of FACTS

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Multi-objective OPF Problem Analysis with Practical Constraints in the Presence of FACTS Devices using NSHCSA

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Multi-objective OPF Problem Analysis with Practical Constraints in the Presence of FACTS Devices Using NSHCSA

M. Balasubbareddy

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Abstract

This research paper proposes a hybrid cuckoo search algorithm (HCSA) for OPF problem solution in power systems. In this, genetic algorithm (GA) is combined with conventional cuckoo search algorithm (CSA) to improve the performance of the single-objective and multi-objective problem solution with satisfying equality, inequality, and practical constraints such as ramp-rate limits and prohibited operating zones (POZ). Fuzzy approach is used to select optimal solution required by the user from the total solutions.

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Performance of Custom Power Devices for Power Quality Improvement

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***Abstract*— During Last decade power quality problems has become more complex at all level of power system. Recently, the Power electronics controllers are gaining concern to provide the quality of power for both power suppliers and consumers. Nowadays a new concept of custom power is used for customer's satisfaction. This paper presents a comprehensive survey of custom power devises in order to improve quality of power. Custom power devices (CPDs) including active voltage conditioner (AVC), dynamic voltage restorer (DVR), and distribution static synchronous compensator (D-STATCOM) are simulated on the modified IEEE-16 bus radial distribution system using Matlab/Simulink software to investigate performance efficiency of each device under various Power quality disturbances including voltage sags, voltage interruption, and harmonic distortions. The simulation results demonstrate that the effectiveness of each device to compensate different types of power quality disturbances depends on the device's arrangement and characteristics.**

***Index Terms*— Active Voltage Conditioner, Dynamic voltage restorer, D-STATCOM, Custom power devices, Power quality, Power quality disturbance.**

I. INTRODUCTION

The electric power system consists of three major functional blocks those are generation, transmission and distribution. As per reliability consideration in power system, generation unit must generate satisfactory amount of power, transmission unit should supply maximum power over long distances without overloading and distribution system must deliver electric power to each consumer's premises form bulk power systems. Distribution system is located at the end of electric power system and is directly to the consumer, so the power quality depends upon the state of distribution system. The reason for this is failure in the electric distribution network accounts for about 91% of the average consumer's interruptions. Earlier, power system reliability focused on generation and transmission system due to capital investment in these systems. But today, distribution system is receiving more attention as reliability is concerned. Power quality issues are achieving a major concern due to the increase in number of sensitive loads. Also the extensive use of electronic equipment, such as information technology equipment, adjustable speed drives (ASD), arc furnaces, electronic fluorescent lamp ballasts and programmable logic controllers (PLC) have entirely altered the electric loads nature. These loads are the foremost sufferers of power quality problems. the non-linearity of these loads cause disturbances in the voltage waveform. The utility will likely to deliver a low distortion balanced voltage to its customers, particularly those with sensitive loads. For the improvement of reliability and power quality of system, the custom power devices are introduced into the power system. DSTATCOM, DVR, AVR, APC etc. are some of the major devices used for the improvement of voltage sag and swells. With the help of these FACTS devices[12], we are capable of reduce the problems related to power quality.

This paper presents a study on the performance of the most renowned CPDs[1] including active voltage conditioner (AVC), dynamic voltage restorer (DVR), and distribution static synchronous compensator (D-STATCOM) under different PQ disturbances. Each device is modelled on the modified IEEE 16-bus[2] radial distribution system using Matlab/Simulink software. Several PQ disturbances including voltage sag, momentary voltage interruption, and voltage and current harmonic distortions are generated to investigate and compare the advantages and limitations of CPDs.

II. POWER QUALITY DISTURBANCES

Electricity consumers face power quality problem at all stages of usage. Actually, Power quality[3] defines the assets of power supply distributed to the users in normal operating conditions. New electronic equipments and devices are more prone to power quality problems[10,11]. Reduced PQ has become a major problem for both power suppliers and customers. Poor PQ means there is enough variation in the power supply to affect equipments and may lead to their mis-operation or failure. It is unfeasible to completely control disturbances on the supply system but efforts and investments are made by utilities to avoid interruptions. Normal operations such as switching loads and capacitors or faults and opening of circuit breakers to clear faults mainly cause disturbances. The most regular and important PQ issues that require practical solutions are as follows:

A. Voltage Sag or Dip

Voltage sag is defined as a drop in the normal voltage level between 10 and 90% of the nominal rms voltage at the power frequency, for durations of 0. 5

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Deep Learning Based Hand Gesture Translation System

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Abstract—

Sign language plays an important role for the people who have the hearing and speech problems. For the Non- verbal communication between the deaf-mute people, For the Kinetics gestures plays a crucial role in our day-to-day life. There are different sign languages that are available Hand Gesture Translation is one among them. The sign language is a collection of different Hand Gesture symbols and Each Hand Gesture symbol have special meaning. It is mostly used by the deaf-mute persons to express their views and thoughts very quickly with the normal people. Main problem with this system is very difficult to translate the symbols and required special training on sign language. To overcome this problem we have implemented a Hand Gesture Translation System it provides an ability to interact with the machine efficiently. It will help the deaf-mute to express their feelings and views more effectively with the normal people. In this paper implemented software prototype that will automatically recognize the hand gestures with an accuracy of 93.4% for gesture Translation which will help the deaf and dumb people to interact easily with the normal people. The main aim of the project is to provide the easy way of communication between the normal people and the deaf-mute through gestures.

Keywords—Hand Gestures; Deep learning; Machine learning; Pre-Processing Image; Feature Extraction of Image; Image Processing; Deaf-mute.

I INTRODUCTION

The Sign language plays an vital role for the communication between the deaf-mute. Hand Gesture Translation System(HGT System) is one among them, which will help the deaf and dumb people to communicate with the normal people through different hand gestures. These hand gestures will help the deaf and dumb people to express their views and thoughts very quickly with the people. The output is produced in the form text so that the people can recognize what the deaf and dumb are saying. The sign language mostly reduces the communication gap between the deaf-mute and the other people.

There are two types of sign languages that are available one is Image based sign language and another one is Sensor based sign language. Sensor based sign language is very costly compared with the Image based sign language because Sensor based sign language is built with the Hardware components whereas Image based sign language is built through Camera. Our Laptop consists of inbuilt Camera which will help to capture the image objects very easily. Hand Gesture Translation System is the software prototype it uses the Laptop inbuilt camera for capturing the different hand gestures and produces the output in the form of Text. It is mostly used by people who have speech and hearing problems to speak with the people. Because sometimes the people cannot understand what deaf and dumb people are saying in that case these hand gesture Translation system will used because the output is produced in the form of text, which the normal people can able to read. One of the Advantage of Image based approach is not to wear the Hand Gloves, Helmet etc. Sign language identification is significant in many domain areas such as user-interface, Interaction, security and multimedia. There are two parts in sign language identification one is sign detection and another one is sign Translation. The system will use the web camera for capturing the hand gestures and after successfully capturing it will recognize these hand gestures and produces the output in the form of text.

In Machine Learning is useful in solving different real-time problems. This technology is mostly performs complex jobs such as classifying data, Translation of data, identifying data and predict the values. The basic idea of every machine learning project is to give a input data to the machine to generate a system which can be produce the result. Thus the obtained result offer the correct response with the new input or generate predictions for the known information. The objective of our proposed system is to train ML algorithm in order to classify the different hand gesture images such as palm, fist. This method is also using deep learning and Tensor flow frame work.

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Word Sense Disambiguation System for Information Retrieval in Telugu Language

Neeraja Koppula, J. Pradeep Kumar, Koppula Srinivas Rao & G. Kiran Kumar

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Abstract

Nowadays, In Natural Language Processing (NLP), using artificial intelligence is a open challenge. Word Sense Disambiguation (WSD) is a sub field of artificial intelligence. In this research paper, WSD system is developed and validated for regional Telugu language. Many Natural Languages are having many ambiguous words. The word having more than one sense is known as ambiguous word or polysemy word. Word Sense Disambiguation is termed as the methodology of finding the appropriate sense of the

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Multi-threading image processing in single-core and multi-core CPU using R language