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Segmentation and Clustering of Stakeholders using Data Mining Techniques

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Abstract

Stakeholders have lot of influence on the software product. Hence their involvement and influence during the product development is high. There are different types of stakeholders who are either directly or indirectly involved in the development of a software. Having the awareness of these stakeholders software requirements will help the developers to develop a robust software product. Therefore, in this paper we are presenting the different techniques that help the developers to segregate the different types of stakeholders and the major roles played by them in the production of the software product.

Index Terms- Stakeholders, software product, software requirements, Data Mining

1 INTRODUCTION

Stakeholder involvement is crucial for the successful development of the products in the IT industry. Stakeholders must be involved in the software development lifecycle as shown in figure 1. Among the stakeholders some are Active Stakeholders who are directly involved in the production of the software product. Especially in Agile method where the development must be done at a faster rate, stakeholders play a major role. The development team must understand the needs or the requirements of the stakeholder correctly in order to develop the software product fastly.

See all ›
6 References

Segmentation and Clustering of Stakeholders using Data Mining Techniques

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Randomly Tampered Image Detection and Self-Recovery for a Text Document Using Shamir Secret Sharing

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Abstract -**Forgery of the digital image is to hide or to remove some meaningful or useful information of the image. In this paper (k,n) Shamir threshold scheme is applied to an image where the tampering is done randomly all over the image. Performance parameters are checked with the random tampering. Comparative study of algorithm for different block sizes ispresented. The algorithm is checked for four different block sizes 2x2, 2x4, 3x3, 2x5. Effect of these blocks sizes on stego image and reconstructed image is observed.PSNR is calculated for various block sized algorithm andthe visual quality is compared.**

Keywords- Randomtampering, Threshold, Shamir secret sharing

I. INTRODUCTION

Digital image authentication plays a significant role for security services in computer and communication application. In this digital world wherein many a transaction are carried out online, authentication of the document is of paramount importance because digital images can be easily tampered to manipulate the important content, which will lead to disastrous consequence.As for checking the integrity and authenticity of digital images many a scheme, have been proposed and improved upon regularly.

In the process of communication, if a part of the information in digital image documentis falsified, detection of doctored area in the image and subsequently restoring the original information has become highly indispensable task. To protect documents like scanned checks, gold bond certificates, signed documentsetc, tamper detection and repairing technique is essential.

In any document images alphabets, lines, boxes are the major components. These components are digitized into two major gray values one is background values and foreground values. Back ground values are dominantly blank spaces and foreground values are text, linesetc. such images look like binary. After processing, the binary like gray scale document imagedestroys the smoothness in the boundaries of textcharacters, resulting in visually poorperception. This makes authentication difficult for `1binary natured images. To circumvent the above challenge, an efficientalgorithm for semi fragile watermarking is proposed. In this paper (k, n) threshold secret sharing scheme is applied to randomly tampered image. This scheme is used to detect the tampered area as well Simulation results are discussed.

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II. LITERATURE REVIEW

Concept of secret sharing is first presented by Shamir [1]. He made use of polynomial method to generate the shares. All these shares are put together to recover the secret message.Lin, C.C., Tsai, W.H [2] proposed (k, n) secret sharing threshold method where k is the minimum number of shares required to recover the secret out of n shares. Pei-yulin and chi-shiangchan [3] used (k, n) secret sharing threshold method to detect the cheater during secret retrieval process .He has proposed a verifiable secret image sharing scheme that can resist dishonest participants. Che-Wei Lee et.al [4] has proposed a blind authentication method based on Shamir secret sharing. Authentication of the digital document is achieved using this scheme. An algorithm is developed for tamper detection and localization using Shamir secret sharing. Using inverse Shamir scheme a self-repair of tampered data is achieved. Li Bai saroj Biswas et.al[5] used an another scheme along with Shamir secret scheme called matrix projection secret sharing scheme to divide image into n shares out of n ,k shares are sufficient to recover the secret image. This scheme is effective, reliableand secure method to prevent the secret image frombeing lost, stolen or corrupted.Mohammad JavadKhosravi [6] presented a novel stenography technique based on secret sharing and wavelet transform to develop an algorithm which is stable against many attacks and high authentication capability against counterfeiting. In recent years Pei Luo and Andy Yu-Lun Lin [7] has proposed AMD architecture (algebraic manipulation detection)to protect Shamir secret sharing scheme module from attackers and cheaters.AMD scheme is implemented on FPGA to improve the security level under fault injection attack.Angelina Espejelet.al [8] proposes a secret sharing technique to prevent flaws in security.Bichat Chiewthanakul et.al [9] uses Shamir secret sharing schemes to facilitatedistributed trust or shared control for critical activities by gating thecritical action on cooperation by k of nusers.ShuiHuaet.al [10] has focused on watermarking for RFID system. A fragile watermarking technique is developed for RFID tag.Algorithm has developed for tamper detection of RFID tag and locates modification in RFID system.

III. (K,N) THRESHOLD SECRET SHARING

Proposed method explainsthe generation of stego image, authentication and secret recovery, self-repair of tampered image.

A. Generation of stego image

Steps to develop stego image is as follows:

1) The Input image which is in any format i.e. GIF, TIFF, and JPGetc. are converted into PNG format

RRC and MAC Call Flow Procedures for D2D Communication through Sidelink in LTE-A

Sharmila K P, Anjali, Surya Pattar

***Abstract*—Device-to-Device (D2D) communication is one of the most popular topic in the upcoming device communication. D2D provides access to services through direct or indirect connection path with neighboring devices with or/and without ENodeB (eNB) assistance. Some of the problems faced in this case are discovering process of neighbor user equipment (UE) and services, as well as designing suitable and secure protocols for D2D communication. In this paper, we propose a sidelink based D2D communication, wherein a separate unlicensed band apart from uplink and downlink is considered to be allocated for sidelink and is functional without the presence of eNB. In this paper we present a detailed study of operational procedures at Radio Resource Control (RRC) and Media Access Control (MAC) layers for sidelink based D2D communication along with this various messages handled for D2D communication for both scenarios using sidelink has been discussed. Two scenarios of D2D communications have been considered – for both UE's in-coverage and both UE's out-of-coverage. The client side architecture of D2D communication with respect to RRC and MAC layers is also presented.**

Keywords*—Device to device communication, Radio Resource control, Media Access Control, Sidelink, ENodeB, Long Term Evolution, device to device discovery.*

I. INTRODUCTION

The increasing popularity of smartphones and other handheld devices has propelled the rate with which the users communicate. In order to meet these high data rates the network infrastructure has to be expanded, which is not the feasible option as new technologies emerge and the infrastructure has to be then changed every time which in turn leads to huge investment in the infrastructure. D2D is one such option to overcome this huge investment by enabling the devices to communicate in their proximity and thus provides greater potential benefits for both users and service operators [1]. Communication between devices in proximity gives better communication link conditions and thus provides efficient low power communication [2].

Device to device communication is one of the major highlights of Third Generation Partnership Project (3GPP) release 12. Public safety is another key aspect discussed in release 12, which included case studies on public safety in absence of eNB [3]. These case studies require two main device communication mechanisms: Direct Discovery (DD) and Direct Communication (DC). For LTE-A based system direct discovery is itself sufficient for D2D communication and does not need any additional feature of direct communication as the devices once connected can use a direct path or indirect path for communication [4].

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In this paper, we propose RRC and MAC call flow for direct discovery of the device though the use of side link. The remaining part of paper discusses about the RRC and MAC layer in 3GPP protocol stack, client side architecture, and call flow of RRC and MAC.

II. 3GPP PROTOCOL STACK

In 3GPP, RRC and MAC layers exist in both UE and eNB. Here in this paper we are focused in scenarios where both UE's are in coverage as well as for out of coverage. A separate band called sidelink is used for D2D communication as shown in Fig 1. Where both UE's can communicate without the presence of eNB, and thus eNB will not be functional when both UE's are out of coverage.

The functions provided by RRC include broadcast of system information, establishment/ modification/ release of RRC connection, assignment/ modification of UE identity, establishment/ modification/ release of radio bearers, Paging, RRC connection mobility, self-configuration and self-optimization, radio link failure recovery, and so on [3]. RRC will enable direct discovery of the device through the use of SIB19 (System Information Block) and MIB-SL (Master Information Block – Sidelink) received from the eNB or preconfigured into the UE.

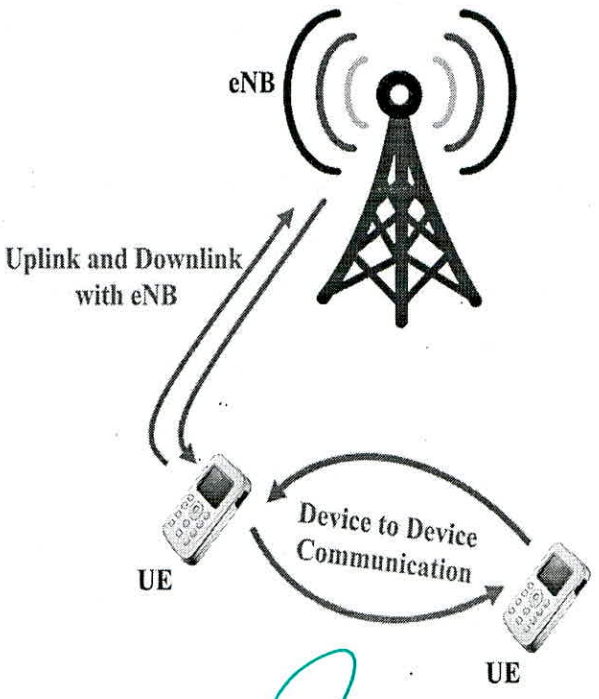

Fig. 1. Sidelink Device to Device Communication

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Improvised routing using Border Cluster Node for Bee-AdHoc-C: An Energy-Efficient and systematic Routing Protocol

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Abstract— **For making Mobile ad hoc network (MANET) more energy efficient swarm intelligence is used as a base and the clustered based approach as Bee-Ad Hoc-C which is an evolution from Bee-Ad-Hoc has been chosen as the best method in our previous work along with Stable Cluster Maintenance Scheme. In the proposed method parallel routing has been considered to improve the scalability of the system, reduce the redundancy as well as save the routing time along with improved through put. Here extra care has been taken for inter cluster communication by the use of Border Cluster Nodes (BCN) between clusters. The results are found using the NS2 (Network Simulator-2). By the proposed method the MANET routing can be properly balanced in terms of energy efficiency, energy consumption for routing, routing discover, End-to-End delay, package-size VS Delivery - Ratio, package-size _Vs_ Throughput with a stable cluster network.**

Keywords— Energy Efficient; MANET; Improvised routing; Bee AdHoc-C; Border Cluster Node; Systematic; Routing Protocol

I. INTRODUCTION

According to [7] Mobile Ad hoc Network (MANET) is portrayed by versatile hosts, dynamic topology, multi-jump remote availability and framework less specially appointed environment. A MANET contains versatile hubs, a switch with different hosts and remote specialized gadgets. The fundamental qualities of such systems are dynamic topologies, constrained achievable transfer speed, heterogeneous correspondence connections, and restricted battery power [13, 14]. Here the nodes are usually dynamic which can be present at any place with a wireless link by an omnidirectional antenna. Nodes while communicating can have arbitrary topologies. As the nodes are self configured and dynamic so MANET has very vast application area starting from personal requirement, disaster hit areas to defense. While doing any data transfers the care has to be taken that the data reaches the destination within a limited time with least energy consumed by the nodes. For this Clustered Bee Ad Hoc MANET is chosen as the best routed MANET where the data transfer takes place with a stable process which was introduced in our previous paper. The reason for choosing a Bee Ad Hoc MANET is because it works according to the concept of swarm intelligence where the total nodes are divided into different categories according to their task [1, 3]. As in a Bee group the bees are mainly divided as Packers, Foragers and Scouts similarly in a Clustered Bee Ad Hoc MANET the nodes are divided into Cluster head, Foragers and Scouts. In a normal Bee Ad Hoc-C MANET the cluster head first tries to get the destination within the cluster by foragers or scouts if the destination is not present within the cluster then it takes the help of the scout where it goes out of the cluster in the search of the destination. But here the scouts move randomly outside the cluster and unnecessarily the energy is consumed from all the scouts and the traffic is also increased which leads to delay in communication. But in this paper the concentration is not only concentrating on the transfer of data within a cluster but more concentration is on data transfer between one cluster to other cluster by the use of scout named BCN (Border Cluster Node) which improves the MANET in following ways:

i- Helps the cluster head in finding the destination easily.

ii- Energy consumed by the nodes unnecessarily is less.

iii- Traffic control can be done for the nodes.

iv- Redundancy is reduced.

v- Delay time for communication is reduced.

II. WORKING OF BEE ADHOC-C MANET

According to recent researches finding multipath for data transmission with minimum use of energy is very much required for any efficient MANET network [6, 7]. For which clustering is considered to be the best method to extend the network lifetime and achieve network scalability [1]. Also in clustering multipath mechanism can be used so that data can reach the destination through more than two paths. This helps the batteries to carry their power for more time as a result the network can have prolonged life time and a justified load balancing can be done between the nodes.

According to the previous work Bee-Ad Hoc-C is an occasion driven and on-interest multipath routing technique for

Avoiding Spam Attack in Distributed Crawling of News Sites

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Abstract

With enormous growth of number of documents in web in the past decade, distributed crawling has been the requirement to crawl web pages. Any search engine would crawl the web pages continuously and index them so as to service the end user. While creating a web page, a content provider can design a page in such a way that could mislead the crawler. This could be through metadata or the actual content of the page. In this work, we address the problem of tackling spam attack by the content provider during distributed crawling of news sites. We provide a PEFT (Preemptively Estimate Fetch Time) algorithm, which estimates the next fetch time of the web page based on the changes done in the web page. Our algorithm starts crawling all the sites with fixed periodicity and eventually adapts over a period of time. We evaluate our algorithm on Hindi and Marathi news sites.

Introduction

Crawling is a process of fetching the web pages and parsing them before indexing them for retrieval. In distributed environment, multiple systems do the crawling process continuously and store the index in a centralized location. In distributed crawling, each or some worker threads are made to run on a different machine or node so that the throughput is increased. Each node is responsible for certain hosts. Partitioning the hosts among various hosts can be based on various policies. One policy is based on geographical location. Because a web page generally contains majority of links to a page of same site, most of the extracted URLs fall under the responsibility of the same node. The URLs whose responsibility falls under other nodes have to be forwarded to the respective nodes. Specifically speaking we can have a URL splitter before the Duplicate Elimination module which takes care of this. There exist various replicas of some famous web pages in multiple websites. In order to determine whether a web page is a copy of a previously seen web page, we should maintain a fingerprint or shingles of each web page. Distributed crawling becomes tricky if we want to detect such replicated web pages. For checking whether a page is a replica, it is not sufficient to check for replica from the pages crawled by the same node. It might be the replica of a web page crawled by some other node. So we have to check for the web pages from all the nodes. One possible idea is we can do batch lookup which reduces the number of network requests. The other problem with distributed crawling is a spam page could occupy all the resources of the crawler not allowing it or crawl other resources. This could be done by putting misleading information in the metadata or the content of the webpage. In this work we develop an adaptive crawler that estimates the next fetch time of every news site. This will help us avoid the spam attack of news site on crawler.

A news search is a special type of web search which crawls only news articles. Such a search engine is required to crawl news articles and to visit the news sites several times a day. Three objectives that news search need to fulfill are:

Conference Paper ASSESSING UNCERTAINTY OF VARIABLE SOURCE AREA, HYDROLOGICAL MODEL IN HARANGI WATERSHED, KARNATAKA STATE, INDIA

August 2017 · Conference: 37th IAHR World Congress · At: Kuala Lumpur, Malaysia · Project: VSA Modeling


Kumar Raju B C


Lakshman Nandagiri

References (19)

Abstract

Assessing uncertainty associated with distributed Variable Source Area (VSA) hydrological models are essential for accurate simulation of stream flows of the humid tropical watersheds. The present study is taken up to assess the uncertainties associated with the Soil and Water Assessment Tool – VSA (SWAT-VSA) model using Generalized Likelihood Uncertainty Estimation (GLUE) technique. The study is carried out in Harangi watershed (538.8 km2) located in the humid region of Karnataka State, India. The goodness-of-fit and efficiency of the model have been tested using the Nash-Sutcliffe efficiency (ENS) as the objective function. Sensitivity analysis indicated that model parameters CN2, Alpha_Bf and Sol_Awc are important for simulating uncertainty associated with stream flows. The P-factor, which is the percentage of observed data bracketed by the 95% prediction uncertainty (95PPU), was 43% and 48% during calibration and validation periods. The results indicated that the GLUE technique applied on the SWAT-VSA model performed well in quantifying uncertainties in stream flow estimates at the outlet of the Harangi watershed.

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RESEARCH ARTICLE OPEN ACCESS

E-Health Care Smart Networked System

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Abstract:

This is particularly the case on e Health monitoring applications for chronic patients, Where Patients monitoring refers to a continuous observation of patient's condition (physiological and physical) traditionally performed by one or several body sensors. The architecture for this system is based on medical sensors which measure patients' physical parameters by using wireless sensor networks (WSNs). These sensors transfer data from patients' bodies over the wireless network to the cloud environment. The system is aimed to prevent delays in the arrival of patients' medical information to the healthcare providers, Therefore, patients will have a high quality services because the e heath smart system supports medical staff by providing real-time data gathering, eliminating manual data collection, enabling the monitoring of huge numbers of patients. We underline the necessity of the analysis of data quality on e-Health applications, especially concerning remote monitoring and assistance of patients with chronic diseases.

Keywords — -

I. INTRODUCTION

Wireless Sensor Networks (WSNs) have facilitated the way for development of various aspects of sensing. WSNs have been applied in different applications such as military applications, climate monitoring applications, underwater networks applications, and structural health monitoring applications. WSN are facing many challenges such as limited computing power, memory capacity and data transmission capabilities. Thus, using cloud computing would be an appropriate solution to improve sensors efficiency.

Cloud Computing is a general expression for any technological services provide through the Internet [1]. Cloud computing provides compatible and on-demand network access for numerous computing resources such as networks, systems, applications, and services. Moreover, cloud computing are using modern and flexible methods to provide, manage, and pay for information technology services with minimal management effort and cost. Cloud computing technology has several advantages such as flexibility, highly auto-mated, low cost, fast services providing, and a huge storage capacity. The Cloud's features enable customers to build, test, and deploy their applications on virtual servers using different infrastructures and multiple operating systems. Cloud service providers offer three different types of services in order to obtain their customers more flexibility, which are Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). SaaS provides remotely access to software applications and their functions as a Web based service. (PaaS) offers application frameworks and operating systems, obtains to minimize the development efforts, and provides many applications in the cloud for users without installing any framework or software on their machines. (IaaS), offers a pool of cloud computing resources, including hardware, servers, networking components, and a massive storage space. Finally, cloud computing offers unlimited data storage. Therefore, the organizations and users who are using the cloud do not need to be concerned about the size of their files.

Amazon Web Service (AWS) is one of the famous cloud providers which provides infrastructure as a service with different types of services such as, Amazon Elastic Compute Cloud (EC2). Amazon EC2 is a cloud service that designed to make web-scale computing easier for developers and to provide flexible compute capacity in the cloud. In this paper, we focus on the idea of integration between wireless sensor network and cloud computing. After health sensors that are connected to patients' bodies collect and transmit data to the cloud, services which are available in this cloud are responsible for receiving, storing, processing, and distributing this data. We suppose that this solution offers an appropriate scenario to provide a comprehensive telemedicine service which automates the processes from collecting patients' data to delivering compatible medical decisions based on patients' current conditions and their historical medical data.

The contributions of this paper are:

- A framework for integrating WSN and cloud computing.
- A prototype implementation using e-health sensors and the Raspberry Pi.
- Improve the sensor Efficiency

Electrical Properties of Praseodymium Oxide Doped Boro-Tellurite Glasses

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Abstract: Glasses of the composition xPr_6O_{11}- (35-x)TeO_2-65B_2O_3 (x=0, 0.1 to 0.5 mol %) have been prepared using the melt quenching method. The ac and dc conductivity of glass have been measured over a wide range of frequencies and temperatures. Experimental results indicate that the ac conductivity depend on temperature, frequency and Praseodymium content. The conductivity as a function of frequency exhibited two components: dc conductivity (σ_{dc}), and ac conductivity (σ_{ac}). The activation energies are estimated and found to be decreases with composition. The impedance plot at each temperature appeared as a semicircle passes through the origin.

INTRODUCTION

The use of glasses both as electrolyte and electrode materials has given a boost to the study of ion transport in glasses and search for a new glassy material. Boro-Tellurite glasses in particular have attracted a lot of attention because of their high ionic conductivity, especially when mixed with Te^+ ion. This property makes a basis for their applications in electrochemistry as solid electrolytes [1]. It is well known that Tellurite ion conducting batteries developed high voltages and high energy density due to their light weight and highly electropositive character of the Tellurite metal [2].

Impedances are complex and from the Cole–Cole plot of these complex quantities, one extracts not only conductivities but limiting high and low frequency dielectric constants. The conductivity is generally studied as a function of temperature and it may also depend on structural changes in the material. In this point of view it is interesting because the conductivity of vitreous material is caused by at least two different contributions. The first one is thermal activation, the conductivity increases with temperature according to the Arrhenius law. The second one is the structural change of the glass with temperature and composition, which also causes a variation of conductivity. Therefore it is also interesting to understand the dynamics of the mobile ions in solid ion conductors by interpreting the frequency dependent features in their dielectric response [3]. In an effect to understand the electrical properties of Pr_6O_{11}-TeO_2-B_2O_3 glass system has been taken up for the present investigation.

In this paper we report both dc and ac conductivity on Pr_6O_{11}- TeO_2-B_2O_3 glasses over wide range of compositions, temperatures and frequency.

MATERIALS AND METHODS

The glasses with composition xPr_6O_{11}-(35-x) TeO_2-65B_2O_3, (x=0, 0.1 to 0.5 mol %) have been prepared by melt quenching method [4]. The prepared samples were taken in the form of circular disc of diameter of about 1 cm and thickness of about 0.1 cm for electrical relaxation measurements. Before making electrical measurements, the sample surfaces were polished, then coated with silver paste and dried over 6 to 12 hours at 330K. The electrical measurements were carried out by sandwiching the samples between electrical leads made up of copper.

Precision impendence analyzer [Agilent-4294A] was used to measure the capacitance (C_p) and conductance (G) in the frequency range from 6Hz to 10MHz. Measurements were made in temperature ranges from 343 K to 443 K. A home built cell assembly (2-terminal capacitor configuration and spring loaded silver electrodes) was used for

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Study of High Frequency Characteristics Of Metal Oxide Surge Arrester

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***Abstract*—Metal Oxide Surge arresters are subjected to continuous operating voltages and transient voltages. In the gapless metal oxide surge arresters a leakage current flows through the arrester at working voltages. The leakage current increases as the temperature of the arrester block increases. In the present study the arrester is subjected to a sinusoidal voltage of variable frequency ranging from 10Hz to 2MHz. The leakage current, phase angle between the leakage current and applied voltage are measured. The measurements indicate that the magnitude of leakage current increases and the phase angle decreasesfrom about 90°leading to zero as the frequency is increased. The experiments were repeated for different block temperatures. The frequency response of the arrester blocks is obtained from this which could be useful as diagnostic parameter and also for modeling the arrester behavior at high frequencies.**

Keywords—*Metal Oxide Surge Arrester (MOSA), Thermal Ageing, Frequency Response*

I. INTRODUCTION

Surge arresters are the primary protecting devices for all equipments of transmission and distribution systems, from the effects of lightning and switching over voltages. The state of the art technological developments that took place in the past few decades, both in the Zinc oxide (ZnO) basic material properties on one hand and in the housing material on the other hand, encourages the use of metal oxide surge arresters without gaps (also called gapless ZnO surge arresters) in AC and DC systems. Most of the arresters installed today are all ZnO arresters without gap. The distinctive features of a ZnO gapless arrester is its excellent protective characteristics attributed to their extremely nonlinear voltage-current (V-I) characteristic with no follow current, higher energy handling capability, higher and better short circuit handling capability, better pollution performance, better capability to handle multiple lightning strokes, stability in V-I characteristics over a long period, makes it possible to dispense with the older Silicon Carbide gapped arresters. Arresters integrated into disconnect switches have also been installed at some places.

Since the gapless surge arrester is permanently connected across the equipment to be protected, it is continuously energized with normal power frequency voltage. Due to this, surge arresters at substations are exposed to a variety of stresses originating from thenetwork and from their service environment. Excessive stresses can cause premature ageing/degradation of electrical properties of ZnO elements possibly leading to their premature failure while in service. The various electrical / mechanical stresses to which the metal oxide surge arrester may be subjected to throughout its life time are:

- Continuous leakage current at operating voltage
- Temporary over voltage and associated increase in leakage current causing temperature rise
- High transient impulse currents due to excessive and frequent over voltages due to lightning and switchingwhich affect thermal stability and cause ageing, energy withstand capability and external insulation
- Rain and solar radiation
- Wet pollution on the housing
- Mechanical Bending Moment and cantilever loadsdue to wind and possible ice loading as well as forcesfromrare events like extreme wind gustsof short period
- Forces due to short circuit current, etc.

All these stresses acting together or individually affect the arrester characteristics and subsequently its performance on the long run. So the arresters shall be designed to have

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Noise Elimination in Degraded Kannada Speech Signal for Speech Recognition

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Abstract—— **In this paper, we demonstrate the methods for preprocessing of noisy speech data to build an Automatic Speech Recognition (ASR) for Kannada language. The methods are spectral subtraction with Voice Activity Detection (VAD), Linear Prediction Coefficient (LPC) analysis of speech using autocorrelation and periodogram subtraction method. In spectral subtraction method, noisy speech data is segmented and windowed into 50% overlapped frames and is processed frame by frame. An application of VAD is to detect only active regions of speech signal. In LPC analysis of noisy speech using periodogram and autocorrelation subtraction methods, the autocorrelation coefficients are calculated first and then by subtracting the periodograms of additive noisy signal from corrupted speech signal, the noise is eliminated.**

Keywords—Automatic Speech Recognition (ASR), Voice Activity Detection (VAD), Linear Prediction Coefficient (LPC).

I. INTRODUCTION

Speech communication is a media for human beings used daily in their routine. The degradations in the speech signal are occurred by different types of noises in the environment. The Voice Activity Detection (VAD) is used to identify only the active regions in corrupted speech signal [1-2]. Corrupted speech is a combination of additive noise and clean speech signal. Normally corrupted speech is processed by assuming the noise is also having long term stationary characteristics over a speech. Corrupted speech signal could be processed by considering the high Signal to Noise regions (SNR) and low SNR regions. The impact of noise can be eliminated by subtracting the average magnitude spectrum of noise model from average magnitude spectrum of degraded speech signal [3-5]. The noise elimination algorithm is mainly associated with VAD. The way of using several preprocessing methods to enhance the degraded speech is called speech preprocessing [6-8]. An autocorrelation subtraction method is used for LPC enhancement of degraded speech [9]. In this method, the noise can be suppressed by subtracting the periodogram of additive noise model from the periodogram of degraded speech signal and autocorrelation coefficients of both the signals are calculated [10-14].

In this paper, spectral subtraction approach and LPC analysis of speech signal using subtraction of periodograms are addressed. The remainder of the paper is given as follows: The details of the spectral subtraction with VAD are given in Section II and in Section III analysis of speech using autocorrelation subtraction method is given. Section IV depicts the experimental results and analysis. The conclusions are given in section V.

II. SPECTRAL SUBTRACTION WITH VAD

A. Degraded speech modeling

Consider a clean speech signal s(t) is degraded by background noise signal n(t) which leads to a corrupted speech c(t). The corrupted speech is currently in time domain which can be converted into frequency domain. Continuous-time signal c(t) is sampled at equal intervals of time t = nTs hence resultant degraded speech signal c(n) is obtained as follows.

$$c(t)=s(t)+n(t) \quad (1)$$

$$c(n) = c(nTs) \quad (2)$$

where Ts be the sampling period which can also be represented as

$$f_s = 1/Ts \quad (3)$$

in this work, the isolated kannada word Daavanagere is recorded in clean environment using good quality microphone. An Additive White Gaussian Noise (AWGN) is added with an isolated kannada speech signal and hence the corrupted speech signal c(n) is obtained. The same need to be enhanced using spectral subtraction method to know the significance of this method in noise elimination. The degraded speech c(n) is converted into segments. Each segment consists of 256 samples with a sampling frequency of

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Color Image Enhancement Techniques in Wireless Capsule Endoscopy

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***Abstract*—Wireless Capsule Endoscopy (WCE) is available since 2001 and has been established as one of the principal approaches to examine the entire GI tract particularly the small bowel. WCE images are dark and difficult to visualize for diagnosis by physicians. Image enhancement methods to improvise the contrast of the images maybe adopted. The experimental results of various image enhancement techniques such as histogram equalization, Multi Scale Retinex and Contrast limited Adaptive Histogram Equalization techniques were being compared and analysed. Image enhancements techniques were applied for both on color image and gray scale image. The experiment results suggests that CLAHE provides better contrast improvement of WCE images, while Multi Scale Retinex provides better human visualization. The proposed future work is in progress in image fusion process; adapting both CLAHE and MSRCR image enhancement techniques.**

Keywords—ColorImageEnhancement;Histogram Equalization; CLAHE;Mutli Scale Retinex;Gaussian Surround function

I. INTRODUCTION

From past decade, Wireless Capsule Endoscopy (WCE) has been accepted widely all over the world for diagnosis of various diseases related to human digestive tract as it allows the doctor to examine the interior of complete gastrointestinal tract in less invasive manner. However, due to the low power and hardware limitations [1], the image quality of capsule endoscopy is lower than that of conventional endoscopic instruments. The WCE images suffer from blurness, lower brightness and contrast which vary perpetually over diverse samples of images; collected for a particular patient.

Various global image enhancement techniques exists to enhance the contrast and texture information of images in WCE images such as histogram equalization [2], adaptive contrast diffusion [3], Contrast Limited Adaptive Histogram Equalization(CLAHE) [4] . However most of these techniques are aimed at gray scale images. One of the major issues out of the 800 WCE images collected for a patient, the brightness and blurness varied from one image to other image vastly. Hence there is a need for an extensive amount of experiments to be conducted on different types of WCE images to provide better visualization which would help to identify lesions and classify more efficiently and accurately.

Uneven brightness and darkness is one of the major issues in WCE images (Fig.1) which mainly hinders the segmentation of region of interest in WCE images. It implies closer the object to lens higher is the intensity, whereas faraway objects are difficult to discern. The images for conducting the experiment have been downloaded from Atlas of Gastro Intestinal Endoscopy [11]. The proposed image preprocessing technique is aimed at Image Enhancement i.e improving the image contrast and brightness; in general perceivability of the image without introduction of distortions and artifacts.

II. IMAGE ENHANCEMENT

A. Related Work

Histogram equalization which is one the most simple and indiscriminative method for automatic contrast image adjustment, can sometimes saturate the image and worsen the results for feature extraction. CLAHE (Contrast Limited Adaptive Histogram Equalization) looks more promising for contrast adjustment [6][7] as it actually operates for each tile in the image which are small regions of the image and thus allows for a more accurate control of contrast. High Boost Filtering (HBF) improves the high frequency components while eliminating the low frequency components. This may add distortions in the smoothing regions due to over filtering. A modification of brightness preserving the dynamic histogram equalization is Brightness Preserving Dynamic Fuzzy Histogram Equalization (BPDFHE) [8]. BPDFHE improves the contrast and preserves the brightness and reduces the computational complexity, in the process introducing additional artifacts based on the variations in gray level distributions [9] which may lead to inaccurate diagnosis. The adaptive nonlinear diffusion filter enhances the contrast of the image; but limited only to gray scale images. [10]

However, the choice of choosing the image enhancement algorithm depends totally on the specification of capsule endoscopy image.

Further in this paper focus has been made on major Image pre-processing requirements of capsule endoscopy images i.e.

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Sidelink based D2D Communication in LTE-A

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ABSTRACT: Device-to-Device (D2D) communication is one of the emerging topic in the upcoming LTE-Advanced (LTE-A) mobile communication technology. D2D offers opportunities for access to services through direct neighbor device connection with or/and without ENodeB (eNB) assistance. It will facilitate the interoperability between critical public safety networks and ubiquitous commercial networks based on LTE-A. The design problems faced in this case are discovery of neighbor user equipment (UE) and services, as well as designing suitable and secure protocols for D2D communication. In this paper we propose a design for D2D communication in LTE-A through sidelink. The sidelink is considered to be allocated with a separate band apart from uplink and downlink. We discuss the sidelink access design for D2D communication and high level communication representation at both client and server side. The design is carried out for three cases: either both UE's are within eNB's coverage, one of the UE is within eNB coverage (partial coverage) or for both UE's being out-of-coverage.

KEYWORDS: Device to Device Communication, Prose, Sidelink Communication, Long Term Evolution, 3rd Generation Partnership Protocol, Proximity Services, and LTE Advanced.

I.INTRODUCTION

In recent years, higher data rate applications such a video calls, online gaming etc. have become very popular and needs much of attention. Third Generation Partnership Project (3GPP) Long Term Evolution (LTE) is aiming to provide technologies with high data rates and higher network capacity. Apart from this, LTE-A adds new components for LTE to meet higher communication demands. D2D communication is one such addition for LTE-A designed in view of providing higher data rates and public safety services. D2D is specified by 3GPP in LTE Release 12, focusing on Public Safety applications. D2D enabled LTE devices have the potential to become competitive for fallback public safety networks that must function when eNB is not functional. Direct communication between nearby UE's will improve spectrum utilization, energy efficiency and throughput, and enabling new peer-to-peer services and location-based applications. D2D can be integrated into cellular networks by having an in-band communication or out-band communication. In an in-band communication, licensed spectrum is used to have D2D communication. Thus for an in-band communication a user can use dedicated pool of resources termed as underlay approach or re use other UE resources termed as overlay approach. While for out-band communication an unlicensed band is used for D2D communication.The D2D is termed as proximity services by 3GPP and has two main components: direct discovery and direct communication. Where direct discovery allows a UE to discover UE's in proximity which are capable of D2D communications and direct communications lets the UE to communicate with other UE's through LTE network or unlicensed band interface. Since D2D is all together a new component being added, it introduces many design challenges such as a choice between uplink and downlink for D2D communications, Multiple access technology, resource allocation schemes, D2D functions when UE is in different coverage scenarios, etc..In this paper we propose a sidelink based D2D communication for multiple scenarios with a consideration that a separate unlicensed band allocated for sidelink based communication. In the remaining part of paper we discuss about D2D communication scenarios, its protocol stack, Sidelink access design and high level communication design at both client and server side.

II.D2D COMMUNICATION

D2D communication as described earlier has two main components: direct discovery and direct communication. Direct discovery is an important aspect among these, since once device discovery is completed UE's can use the underlay

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Hidden Markov Model: Application towards Genomic Analysis

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***Abstract*—Hidden Markov Model (HMM) has become one of the interesting methods for the researchers, especially in bioinformatics where different analysis are carried out. These are widely used in science, engineering and many other areas such as bioinformatics, genomic mapping, computer vision, finance and economics, and in social science. HMMs require much smaller training sets, and that the examination of the inner structure of the model provides often a deeper understanding of the phenomenon. In this survey, we first describe the important algorithms for the HMMs, and provide useful comparisons, aiming at their advantages and shortcomings. We then consider the major g applications, such as annotations, gene alignment and profiling of sequences, DNA structure prediction, and pattern recognition. We also list some analysis on how to use HMM for DNA genomes. Finally, we conclude use and perspectives of HMMs in bioinformatics and provide a critical appraisal for the same.**

Keywords—Hidden Markov Model; Multiple Sequence Alignment; pattern recognition; sequence analysis

I. INTRODUCTION

A Markov process is an uncertain model, where the state belongs to a finite set, the evolution occurs at a discrete time and the probability distribution of a state at a given time is explicitly dependent only on the previous state.

A Markov chain is a Markov process for which the probability distribution of a state at a given time is explicitly dependent only on the state which is just preceding it and all the other states are irrelevant [1]. More specifically the transitions among the finite set of possible states are supervised by a set of conditional probabilities [2]. The transitional probabilities are implicitly independent of the time. In bioinformatics, for a DNA sequence [3], the position along the sequence is revealed as "time".

Hidden Markov model (HMM) is [4] an analytical Markov model in which the system being modeled is considered to be a Markov process [5] with unobserved states. In HMM, the state is not directly visible. Each and every states have probability distributions over the possible results. Therefore the sequence of results produced by an HMM provides some details about the sequence of states [6]. The hidden points out the state sequence through which the model travels. So the time evolution of the internal states can be produced only through the sequence of the observed output states. The paper by Rabiner [7] is widely well appreciated for the clarity in explaining HMMs.

In this paper, we give a brief insight on the various HMM algorithms and their comparison. Later, we describe about the applications of HMM in bioinformatics, followed by the description on how the Hidden Markov Model for DNA sequence analysis can be carried out. Finally we conclude the use and perspectives of HMMs in bioinformatics.

II. ALGORITHMS IN HIDDEN MARKOV MODEL

Some mutual problems that Hidden Markov Models deal with are as follows:

A. Evaluation problem

Also known as the direct problem, computes the probability that a given model generates a given set of observations. Given an HMM, λ and a sequence of operations, $O = O_1, O_2, \ldots\ldots O_T$, what is the probability that the observations are generated by the model $P\{O \mid \lambda\}$. The generally used algorithms for evaluation problem are:

1. Forward algorithm: finds the probability for a given model starting from the beginning of the sequence [8].
2. Backward algorithm: finds the probability for a given model starting from the end of the sequence [8].

The probability of observing a sequence E given a HMM, λ is given by

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Image And Pixel Based Scheme For Bleeding Detection In Wireless Capsule Endoscopy Images

Vani V. and K.V.Mahendra Prashanth

Abstract Bleeding detection techniques that are widely used in digital image analysis can be categorized in 3 main types: image based, pixel based and patch based. For computer-aided diagnosis of bleeding detection in Wireless Capsule Endoscopy (WCE), the most efficient choice among these remains still a problem. In this work, different types of Gastro intestinal bleeding problems:Angiodysplasia, Vascular ectasia and Vascular lesions detected through WCE are discussed. Effective image processing techniques for bleeding detection in WCE employing both image based and pixel based techniques have been presented. The quantitative analysis of the parameters such as accuracy,sensitivity and specificity shows that YIQ and HSV are suitable color models; while LAB color model incurs low value of sensitivity. Statistical based measurements achieves higher accuracy and specificity with better computation speed up as compared to other models. Classification using K-Nearest Neighbor is deployed to verify the performance. The results obtained are compared and evaluated through the confusion matrix.

1 Introduction

Capsule endoscopy has been proved as a standard well-established non-invasive technique for identification of obscure Gastro Intestinal (GI) bleeding. The standard method for reading capsule endoscopy images involves watching streams of 50,000 capsule endoscopy images; it is time consuming; requiring about 17-60 minutes of average reading time[1]. An important challenge in the area of capsule endoscopy is

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Influence of Profile on the Pollution Performance of Cap-and-Pin Insulators—An Experimental Study

Key words: suspension insulator, insulator profile, pollution performance, salt-fog test

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This article analyses the experimental withstand salinity characteristics of various profiles of insulator strings for 220-kV and 400-kV systems and presents an analytical interpretation that aids in the prediction of the maximum withstand salinity characteristics, which serves in the selection of external insulation.

Introduction

Transmitting power by extra-high voltage and ultra-high voltage systems becomes obligatory with the rapid increase in power demand by industrialization and urbanization. Insulators in the transmission system play a significant role in maintaining the reliability of the network by providing the required mechanical support and electrical insulation.

Outdoor insulators, as the name suggests, are exposed to both man-made and natural pollution throughout their operation. Over a period of time, the pollution in the atmosphere gets accumulated on the surface of insulators. When the contaminant layer is subjected to wetting, mostly due to highly humid conditions, scintillations result, which most often is followed by flashover. Tripping in transmission networks due to pollution flashover is experienced in the USA, Canada, Saudi Arabia, China, and India [1]–[5]. Once the flashover event occurs, the system breaker on auto reclosure subsequently operates and repeats as long as the condition favoring flashover persists. Normally, after three trips the line trips off and the reason for the fault is investigated before the line is manually reclosed.

Tripping because of pollution flashover cannot be nullified unless and until the wetting conditions get cleared, which threatens the reliability of electrical supply systems. Therefore, it is necessary to have sufficient knowledge of the pollution severity prevailing in the field and the behavior of the insulator under polluted conditions. The selection of outdoor insulation should be made in such a way that the insulator is capable of withstanding the pollution severity [6], [7].

By conducting a series of pollution flashover experiments, it has been well established that the flashover voltage of insulators is dependent on the diameter (D), leakage length, form factor (FF), and the equivalent salt deposit density [8]–[15]. The possibility of application of regression analysis for the prediction of pollution performance of an insulator as a function of equivalent salt deposit density, D, and leakage length had recently been brought out as both single function [16] and multiple functions [17]. In most cases the analysis is based on maintaining a constant equivalent salt deposit density on the insulator surface and having an increased voltage across the insulator. But in actual service, the voltage remains constant while the pollution deposit on the insulator varies from time to time. Therefore, it becomes necessary to analyze the pollution performance of insulators under actual service conditions and to bring out the influence of insulator profile in terms of maximum withstand severity.

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Photoluminescence Studies of Europium (Eu^{3+}) doped Lead Borate Glasses

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Abstract

Europium (Eu^{3+}) doped lead borate glasses have been successfully prepared by conventional melt quenching method and their luminescence properties were carried out using excitation and emission spectra. The Photoluminescence (PL) spectroscopy were used to examine down conversion (DC) emission under 394nm excitation exhibits five emission bands centered at 577nm, 590nm, 612nm, 650nm and 697nm corresponding to $^5D_0$-$^7F_0$, $^5D_0$-$^7F_1$, $^5D_0$-$^7F_2$, $^5D_0$-$^7F_3$ and $^5D_0$-$^7F_4$ transitions of Eu^{3+} ions, respectively and also recorded emission spectra at 306nm and 296nm, both the excitations exhibits two emission bands centered at 590nm and 612nm corresponding to $^5D_0$-$^7F_1$ and $^5D_0$-$^7F_2$ transitions of Eu^{3+} ions.

Introduction

Rare earth doped glasses are very prominent materials for solid state laser, optical amplifier, display and photo-electronic devices [1]. Among the other rare earth (RE) ions trivalent europium is owing to the narrow emission band, producing almost monochromatic light and long radiative lifetime [2], this kind of glasses widely used as efficient red phosphors, in particularly designing mercury-fluorescent lamps and plasma displays. Silver containing glasses have been technologically interesting materials for solid state batteries and electrochemical devices due to their valuable optical properties and high value of ionic conductivity [3]. Lead borate glasses are research interest, due to their structural peculiarities. The addition of PbO into the borate network brings modification of boroxol rings and formation of complex groups with one or two 4 co-ordinated boron atoms [4]. Lead borate glasses have several applications including radiation shields, optical, and thermal properties [5].

In the present work, we are reporting the luminescence properties of europium doped lead borate glasses through Photoluminescence (PL) spectroscopy.

Experimental

The raw materials of reagent grade chemicals H_3BO_3, PbO, Ag_2O and Eu_2O_3 were used to synthesize the samples by conventional melt quenching method. The glass with the composition of xEu_2O_3-(1-x)Ag_2O-29PbO-70B_2O_3 (x = 0.5 mol%) were taken in a porcelain crucible and it is placed in a furnace set temperature at 1100°C for 2 hrs and stirring several times to ensure complete melting and homogeneity for the prepared glass. The homogeneous molten liquid was cast into brass mould and quickly presses with another mould and the prepared sample was immediately transferred to another muffle furnace set at 150°C for 1hr to remove thermal stress and strain. The prepared glass sample was cut into appropriate dimensions for the required measurement.

The excitation and fluorescence spectra were recorded using F-2700 FL Spectrophotometer with xenon flash lamp as source.

Result and Discussion

The down conversion (fluorescence) property of Eu^{3+} ions in silver lead borate glass was examined. The excitation spectra of Eu^{3+} was monitored at λ_{em} = 590 and 612 nm of $^5D_0$-$^7F_1$ and $^5D_0$-$^7F_2$ transitions are depicted in figure 1. The spectral range from 200 to 600nm consists of sharp lines, which is attributed from transitions between the 4f energy levels of Eu^{3+}. The excitation bands can be assigned to 362 nm ($^7F_0$-$^5D_4$), 381nm ($^7F_0$-$^5G_3$), 394 nm ($^7F_0$-$^5L_6$), 414 nm ($^7F_0$-$^5D_3$), 465 nm ($^7F_0$-$^5D_2$) and 533 nm ($^7F_0$-$^5D_1$). All the assigned transition values good agreement with excitation values of Eu^{3+} ions as reported in many authors [6,7]. The excitation spectra shows strongest peak at 394 nm for Eu^{3+} and also found that peaks at 296 and 306 nm for λ_{em} = 590 nm and λ_{em} = 306 nm, respectively, there is a peak shift observed in the different emission values of Eu^{3+}. Thus, we consider 394, 306 and 206 nm to be ideal pump wavelengths to generate emission from the prepared sample. Figure 2 shows the emission spectra at λ_{ex} = 394 nm of Eu^{3+} ions in the glass. In glasses, due to the absence of a center of symmetry and long-range periodicity of atoms, amalgamation of the 4f orbitals with an opposite parity orbitals take place. This rise to the electric dipole (ED) allowed transitions. The $^5D_0$-$^7F_2$ emission transition is forced by the crystal field environment in the vicinity of the Eu^{3+} ions. It is hypersensitive (ΔJ=2) transition and its intensity is very sensitive to the local environment. The $^5D_0$-$^7F_1$ emission transition (magnetic dipole, ΔJ=1) of Eu^{3+} ions is forbidden under selection rules, has intensity

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