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Paper Production from Flower: Recycling of Flower Waste

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Abstract

This proposal provides an alternative approach for solid waste management. Solid waste is usually landfilled or incinerated, the volume of solid waste that can be recycled is found to be minimal. This approach will focus on reducing the solid floral waste. India is a country where religion and festivals are part of our lives; we usually worship by providing offerings mostly flowers, coconut, and fruits. Flowers are been widely used to decorate sacred places, wedding halls, temples and used for various auspicious occasions. Tons of floral waste is discarded every day in open spaces after the flowers are dried and used up. Floral waste discarded in open spaces which lead to several airborne disease, waterborne disease and contaminates the surrounding area. Production of paper from floral waste would eradicate deforestation, rates of global warming can be controlled and loss of habitat for wild animals can be minimized, thereby conserving the wild animals. Disposal of floral waste is of a great concern and production of paper from floral waste provides an approach for reducing the volume of floral waste. Utilization of floral waste for production would generate revenue for the temples and marriage halls. Paper obtained from floral waste is eco-friendly, cost-effective and biodegradable.

Keywords: Deforestation, flowers, floral waste, paper production, paper pulp

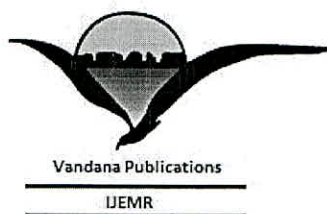**Author for Correspondence* E-mail: anandahv@sapthagiri.edu.in

INTRODUCTION

Deforestation

Deforestation is cutting down of trees due to growing population, urbanization and industrialization. Trees are usually cut down for timbers and for paper production. Deforestation has a major impact on the environment, deforestation leads to global warming, and increased levels of air pollution. Trees are important because they release oxygen, they absorb carbon dioxide which controls the CO_2 levels, and trees prevent soil erosion. Trees help in bringing rain, thereby reducing the temperature of the earth. Cutting down of trees lead to soil erosion, decreased rainfall, thereby varying the climatic conditions. Deforestation leads to flood due to the melting of glaciers.

Flower Waste

Solid waste is usually landfilled or incinerated, the volume of solid waste that can be recycled is found to be minimal. This approach will focus on reducing the solid floral waste. India is a country where religion and festivals are part of our lives; we usually worship by providing offerings mostly flowers, coconut, and fruits [1, 2]. Flowers are been widely used to decorate sacred places, wedding halls, temples and used for various auspicious occasions. Tons of floral waste is discarded everyday in open spaces after the flowers are dried and used up. Floral waste discarded in open spaces which lead to several airborne disease, waterborne disease and contaminates the surrounding area. Production of paper from floral waste would eradicate deforestation, rates of global warming can be controlled and loss of habitat for wild animals can be minimized, thereby conserving the wild animals. Disposal of floral waste is of a great concern and production of paper from floral waste provides an approach for reducing the

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Development and Implementation of VLSI Reconfigurable Architecture for Gabor Filter in Medical Imaging Application

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ABSTRACT

The Gabor filter is a very effective tool in visual search approaches and multimedia applications. This filter provides high resolution in time-frequency domains and thus finds use in object recognition, character recognition and pattern recognition applications. Medical Image analysis using image processing algorithms is one of the best ways of diagnosing diseases inside human body. The Gabor wavelets resemble the visual cortex cell operation of mammalian brains and hence are best suited for biological image analysis. A Tonsillitis detection system is proposed here using Gabor filtering approach. This system detects the presence of Tonsillitis from the tonsils images. A suitable VLSI architecture for the implementation of the Gabor filter was modeled in Verilog using Xilinx tool and simulated using the tonsils test images. The proposed system was successful in detecting the presence of Tonsillitis from the diseased tonsils image. The complete system was then synthesized and implemented on FPGA Artix 7. The design was capable of operating at a maximum frequency of 394.563 MHz.

Keywords— Tonsilitis, Gabor, Medical Image Analysis, FPGA architecture

I. INTRODUCTION

The study of medical image has contributed an important role to biomedical science that supports histo-pathological examination and diagnosing the diseases and disorder factors in human body. A high resolution medical image provides a multi-orientation observation to diagnose several types of health issues. The processing of biomedical images requires more concrete texture and background that represents clear view of internal organs and view of tissues. The Digital medical images obtained from different modalities are often affected by some unwanted factors such as noise, lower resolution, blurriness and geometric deformation. There are various techniques to mitigate such types of unwanted features such as Image smoothing, Image registration, image segmentation. The image smoothing process enhances the images by decreasing noise without affecting original information. The image registration techniques involves the process of aligning the resolution of images and the image segmentation process involves different-different process such as filtering, smoothing, classification and segmentation which helps to generate proper structural visual view from the unstructured image.

A Gabor filter is designed to enhance the biomedical image by segmentation process in which wavelet transform is used to perform multi-resolution time frequency analysis by selecting different kernel resolutions and this makes wavelets an effective tool for performing modification on image such as compression, object recognition, edge detection, filter design and etc. A Gabor filter is used in various image processing applications such as i) Texture analysis- In this Gabor filter is treated as multi-channel filtering approach that is used to identify patterns within a specific orientation and defined frequency range [1], ii) Object recognition- A Gabor filter is used to detect object from the aerial images based on the frequency and the standard deviation. In this aerial images are passed from filter and then specific information is extracted from filtered images for object classification [2]. iii) In medical image processing- For identifying the cancerous cells from Mammogram images a 2-D Gabor filters is used for extracting the space- time based texture features from the mammogram images[3], A bank of Gabor filters is used in medical image segmentation for complex image analysis[4].

In this paper a Gabor filter is designed and used is medical image processing for tonsillitis detection. The following are the key features of proposed work.

- To design and develop of Gabor filter for bio-medical applications based on FPGA.
- Designing a Gabor filter that includes mainly preprocessing module, CORDIC architecture, filtering module and convolution module.

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An Electrocardiograph based Arrythmia Detection System

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Abstract— Cardiac disorders turn out to be a serious disease if not diagnosed and treated at the earliest. Arrhythmia is a cardiac disorder that exists as a result of irregular heart beat conditions. There are several variants in this type of disorder which can be only diagnosed only when patient is under an intensive care conditions and also the patient with such disorder do not experience and physical symptoms. Such diseases turn out to be deadly if not treated early. A detection system is thus required which is capable of detecting these arrhythmias in real time and aid in the diagnosis. An FPGA based arrhythmia detection system is designed and implemented here which can detect second degree AV block type of arrhythmia. The designed system was simulated and tested with ECG signal from MIT-BH database and the results revealed that a robust arrhythmia detection system was implemented.

Keywords— Cardiac, Arrytmia, diagnosis, FPGA .

I. INTRODUCTION

Cardiac disorders is one of the major cause of suffering and death today. Early diagnosis of such disorders leads to a timely treatment and recover from such disorders which may turn deadly if ignored. The current diagnosis of heart diseases depend on visual analysis of Electrocardiograph (ECG) signals.

The acquisition of these ECG signals is achieved using ECG device which uses two to three electrodes connected to different human body parts. These electrodes measure the heart's electrical activity as a function of time. These ECG signals depict an anomaly for a patient suffering from any heart disease. Hence the ECG signals are used for diagnosing the healthy status of the heart.[1]

ECG signals are divided into four important electrical events each representing the phases of a cardiac cycle. The four events are 'P' wave, 'QRS' complex. 'ST' segment and 'T' segment as shown in figure 1 [2].

As each segment in the ECG signal corresponds to a particular physiological state, the analysis of thee segments may be used in diagnosis cardiac disorders. The diagnosis may be detection of presence/absence of heartbeat, calculating the average heart rate, classifying articular or ventricular abnormal beats and so on.
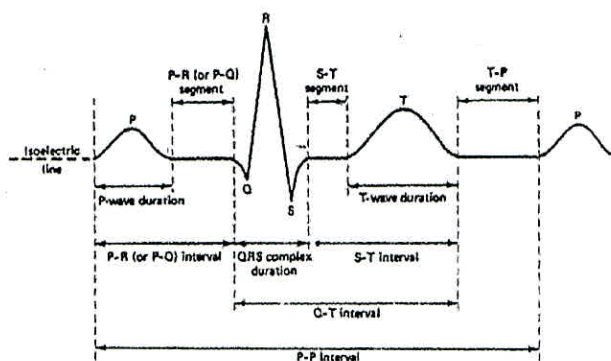

Fig.1. ECG signal

A heart rhythm may be estimated by analyzing the R-R distance in the ECG signal. A normal sinus rhythm will have a consistent R-R interval and within the normal P-R interval range of 0.12-0.20 seconds [3]. Arrhythmia is a condition of a patient whose heart beat rhythm is not being normal or he is suffering from abnormal heart rate. Several arrhythmiatic condition are found to exist such as Sinus Bradycardia, Sinus Tachycardia, Atrial flutter, Atrial Fibrillation, Super Ventricular Tachycardia, First degree AV block, second degree block and third-degree block. The second-degree blocks are a form of arrhythmia where the QRS pulses are found to be dropped in a repeating cycle of every 3rd or 4th P wave of the ECG signal.

This paper presents the detection of the arrhythmia particularly second-degree AV block type where the heart beat is dropped for one or two repeating cycles of the P wave. A FPGA based detection system is proposed to find the presence of such drops in the ECG signal. The heart beats are detected from ECG signal by detecting the QRS complex through suitable filtering and thresholding approaches. The dropped heart beats are then identified as a confirmation of presence of arrhythmia condition.

The organization of paper is followed as: Section II describes the ECG signal processing concepts. Section III describes a general arrhythmia detection procedure. Section

Design of Systolic Architecture Using Evolutionary Computation

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ABSTRACT

This work presents a new concept for finding the optimal values for the entire three fundamental design vectors namely: scheduling, projection and processor so that not only architecture design could be feasible along with that maximum hardware utilizing efficiency could be achieved. This Approach also having the focus to minimize the total delay involved with systolic architecture design. Evolutionary programming has applied to find the optimal solution. Presented work and result will provide facility to designer without any involvement to find out best suited architecture for a particular application. The Proposed method having capability to find the large number of optimal vectors for any algorithm which can be implemented in systolic architecture. The increasing demands of speed and performance in modern signal and image processing applications necessitate a revolutionary super –computing technology. The proposed method is coded in MATLAB editor and simulation environment.

Keywords: Scheduling; Projection; Systolic Array

1. INTRODUCTION

The essential goal of developing new computer architectures and efficient use of existing modern systems is to run larger and more complicated applications faster over time. The continued demand for increased computing power led in the late 1980's to the development of high parallel scalable multiprocessing systems. Parallel computing is a form of computation which many calculations are carried out simultaneously, operating on the principle that large problems can often be divided into smaller ones, which are then solved concurrently ("in parallel")[1]. The most effective way to improve the computer performance in terms of computational speed is to use parallel processing architectures, which employ multiple processors to perform a computation task. When multiple processors working together, an appropriate architecture is very important to achieve the maximum performance in a cost- effective manner. Systolic arrays are ideally qualified for computationally intensive applications with inherent massive parallelism because they capitalize on regular, modular, rhythmic, synchronous, concurrent processes that require intensive, repetitive computation. There is a necessity of an essential tool which maps all the DSP algorithms or high level computations in to hardware architecture which maximizes the hardware utilization efficiency [2]. Systolic Architecture is a general methodology for mapping high-level computations into hardware structures.
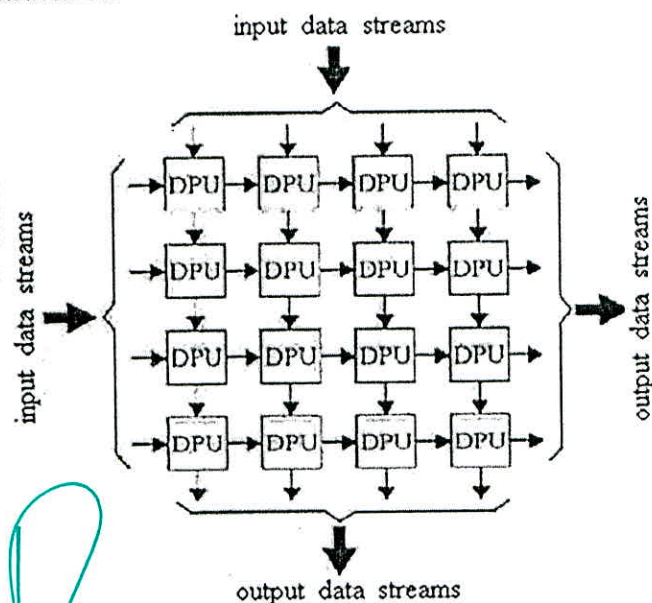

Fig. 1 General model of systolic array

SECURED APPROACH FOR AUTHENTICATION OF MESSAGES IN WIRELESS SENSOR NETWORKS

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ABSTRACT: *Sensor networks are often deployed in unattended environments, thus leaving these networks vulnerable to false data injection attacks in which an adversary injects false data into the network with the goal of deceiving the base station or depleting the resources of the relaying nodes. Standard authentication mechanisms cannot prevent this attack if the adversary has compromised one or a small number of sensor nodes. Message authentication is one of the prominent techniques to mitigate unauthorized and malicious access from being forwarded in wireless sensor networks (WSNs). In this paper, an efficient and robust authentication approach is introduced that is designed based on Elliptic curve cryptography.*

Keywords: **Hop-by-hop authentication, symmetric-key cryptosystem, public-key cryptosystem, source privacy**

1. INTRODUCTION

Message authentication is defined as the way of detecting at the receiver side wheather the message sent by the sender has been modified or not while travelling across transmission medium. Message authentication protects the integrity of the message. The special characteristics of Wireless sensor is the absence of infrastructure. And they also have limited bandwidth, energy constraints, and low computational capabilities. Inspite all these limitations wireless sensor networks have wide range of applications in military, medical field etc.

Since the node is deployed in a hostile environment the security becomes the major constraint in WSN. The WSN can be easily hacked by an attacker and he can gather all the private information which is present. In many cases it is sufficient to secure data transfer between the sensor nodes and the base station. In particular, the base station must be able to ensure that the received message was sent by specific sensor node and not modified while transferring. Many WSN applications needs strong and light weight authentication schemes to secure data from unauthorised users. To overcome all security issue many different scheme that had been discover. Some schemes detects the compromised node , detects the injected false message in the network or giving special authorization

to the sender or receiver, Encryption of decryption is the most often used scheme for providing the security. Message authentication prevents the unofficial and corrupted message in WSN. It is a short piece of information used to authenticate a message and to provide integrity and authenticity to the message. Symmetric key cryptosystems or public-key cryptosystems are the various schemes that are proposed to provide authenticity and integrity of the message. These schemes have limitations such as high computational and communication overhead, lack of scalability, node compromise attacks. Many data gathering protocols are proposed in order to gather data from various nodes in a secure manner and there are various merits and demerits in each of them [2]. To implement Data gathering technique at the Base station authors have used iSense Modular Wireless Sensor Hardware and Software System of Coalesenses product [3].

2. PROBLEM STATEMENT

Purpose of the project is to provide intermediate node authentication without the threshold limitation, and to perform better than the symmetric-key based schemes. The distributed nature of algorithm makes the scheme suitable for decentralized networks.

Important purposes are as follows:

- To develop a source anonymous message authentication code [5] (SAMAC) on elliptic curves that can provide unconditional source anonymity.
- To offer an efficient intermediate node authentication mechanism for WSNs without the threshold limitation.
- To the devise network implementation criteria on source node privacy protection in WSNs.

3. PROPOSED SYSTEM:

The proposed work presents the new scheme of authentication scheme in WSN, though conventional cryptographic scheme used in WSN are not that efficient but the proposed work use multi-hop authentication

Survey on Migration from Cloud Computing to Edge Computing in IoT

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Abstract— Massive growth in the field of IoT produces lots of data, To store and process the data cloud technology is adapted. To bring the feature of cloud closer to the consumer device edge computing is developed which provide many advantage over the cloud computing. This paper focuses on comparison between cloud computing, edge computing and one of the variant of edge computing that is fog computing.

Key words: Cloudlet, Edge Computing, Fog Computing, Mobile Edge Computing

I. INTRODUCTION

Cloud computing is the practice of using network of remote server hosted on the Internet to store, manage and process the data instead of using local data centers. Because of pay as you go, on demand, self-service and resource pooling nature of cloud computing has become the best way to maintain computer resources for many types of applications. Cloud computing is one of the popular technology that provide service to Internet Of Things(IOT).IOT means an ecosystem of connected physical objects that are accessible through the Internet. IOT generates huge amount of data, to maintain this vast data cloud technology is used. Cloud is based on the idea of allowing users to perform computing tasks using services provided over the internet.
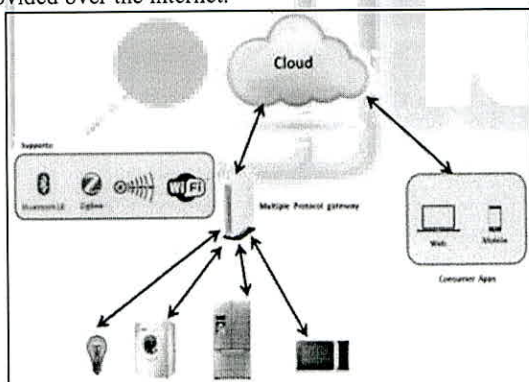

Fig. 1: Cloud in IoT application

Resources pooling and resource scalability are two main services of cloud to IOT. IOT devices can access the resources anywhere and anytime from the resource pool. User can readily scale the services to their needs.

But there are some issues we need to consider while using cloud computing in IOT, cloud is centralized unit since it is far apart from the IOT devices time required to send data produced by IOT devices is considerably more.

Some IOT applications might require very short response time and some might produce a large quantity of data which could be a heavy load for network.

For example in military applications some critical information from IOT must be transferred to processing unit with in a fraction of second but if we use cloud then transmission itself may take some amount of time. One more main issue is, all data produced by IOT is not needed to be stored in cloud for example in production industry so many sensors are used just to monitor whether the machines are working or not. So all data produced by these devises need not be send to centralized cloud because it require much of network bandwidth.

To overcome from these issues Edge Computing was developed.

II. EDGE COMPUTING

Edge computing allows computation to be performed at the edge of the network. Edge computing was developed by CISCO. Edge means it is any computing and network resources along the path between data sources and cloud data center. In edge computing we process the data at the place where it is produced. One of the main advantages of edge computing over cloud computing is, in edge computing the edge has certain computation recourses and this provides a chance to offload part of the workload from cloud.

One more advantage of edge computing is edge of the multiple stakeholders in geographically distributed position can be connected it is called as collaborative edge. These collaborative edges allow different stakeholders to cooperate and share the data.

The edge layer between the end devices and the cloud are implemented in different ways that depends on devices which acts as the intermediate edge nodes and protocols used by edge layer.

This implementation is mainly categorized into
1) Mobile edge computing
2) Cloudlet computing
3) Fog computing

In Mobile edge computing, computational and storage capabilities to the edge of network will be within the radio access network. The main idea behind mobile edge computing is that we can reduce the congestion in network by processing the applications closer to the cellular customer.
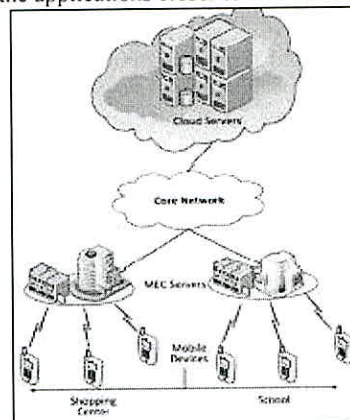

Fig. 2: Mobile Edge Computing

Cloudlet computing is a trusted cluster of computer, well connected to the network with resource available to the nearby mobile devices. Cloudlet is a mobility-enhanced small-scale cloud datacenter that is located at the edge of the

Finding Active Influential User in Multiple Online Social Network

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ABSTRACT: People are very much dependant on Online Social Network for various purposes such as movie review, finding experts, finding opinions about any movies, places or products. Influence Maximization is the problem of finding a small set of influential users in the online social network so that their influence in the social network is maximized. Now-a-days, people are found in more than one social network such as Facebook, Twitter, LinkedIn etc. So, finding influential user in multiple online social network is very much important. Rather than just finding influential user in multiple online social network, finding active influential user would be much more beneficial. The proposed method outperforms the previous methods of finding influential user.

KEYWORDS: Online Social Network, Influence Maximization, Fuzzy K-means algorithm, Active User

I. INTRODUCTION

Social network can be analysed with the help of graphs using a technique called as Social Network Analysis. It is represented as a graph where nodes represents individuals and edges represents interactions or relations between them. The various applications of Social Network Analysis are Data Mining, Behavioural analysis, Link Prediction, modelling of network and also in Recommender systems. It is also used in business applications such as analysis of customer behaviour and marketing and analysis of customer interaction.

One of the applications of Social Network Analysis is in Viral Marketing. There are three types of marketing i.e., Direct Marketing, Mass Marketing and Viral Marketing. Direct Marketing refers to marketing to each and every individual. Mass Marketing refers to marketing to more number of people. Viral Marketing refers to "word-of-mouth" marketing i.e., it uses its customer to market the product. Customer will influence his friends for buying a product and if he gets convinced, he buys a product and starts influencing his friends and so on.

In many markets, customers are strongly influenced by the opinions of their friends. Viral marketing takes advantage of this to promote a product by marketing it primarily to those with the strongest influence in the market. Viral marketing uses the customers in the market to promote a product. This way of marketing is very much beneficial than direct marketing and mass marketing. Further people trust and act on recommendations from friends and they further influence their friends. This is referred to as influence propagation [2]. For example, influence propagation can help decide which sports to watch, which item to purchase and so on. Hence, influence propagation has become an important mechanism for viral marketing. This further motivates the researchers to carry out studies on different aspects of the influence propagation problem. Influence Maximization problem is a problem of finding a small set of nodes that maximizes the spread of influence.

The processing time of older model increases exponentially as network size increases. Now-a-days users are found in multiple online social networks rather than one. User found in more than on network is referred as crossing users. These crossing users are very much important in propagating information in multiple online social networks. In the previous methods proposed, only influential users were taken into account, but in the proposed method the "active" influential user are considered. Active users can be decided based on various factors such as number of posts, likes, views and shares. Fuzzy k-means algorithm is being used to solve Influence Maximization Problem i.e., to find

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A Survey Paper on Influence Maximization in Online Social Network

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Abstract:
People are becoming more interested in online social network and they depend on the social network for many purposes such as finding opinions of other people about any product, movie etc. Influence Maximization is the problem of finding a small set of influential users in the online social network so that their influence in the social network is maximized. There are many diffusion models like Linear Threshold Model and Independent Cascade Model that are used to find the maximum influential user in online social network. This paper presents a survey on these two models and extensions to these models.

Keywords: Influence Maximization, Multiple Online Social Networks.

I. INTRODUCTION

The advent of Online Social Network (OSN) has been one of the most exciting events in this decade. Many popular OSN such as Facebook, Twitter, LinkedIn and Flickr have become increasingly popular. These networks are extremely rich in content and linkage data which can be analyzed. The linkage data is essentially the graph structure of social network and the communication between nodes, whereas the content data contains the text, images and other multimedia data in social network. The richness of this network provides opportunities for data analysis in context of Online Social Network. There are several factors due to which the OSN has gained importance by researchers[1].

Some of the factors are availability of social data that are vast, distributed, noisy and dynamic. There are some research issues with respect to mining the social network sites using data mining techniques.

One of the issues is Influence Propagation. In many markets, customers are strongly influenced by the opinions of their friends. *Viral marketing* takes advantage of this to promote a product by marketing it primarily to those with the strongest influence in the market. Further people trust and act on recommendations from friends and their further influence their friends. This is referred to as *influence propagation*. Influence propagation has become an important mechanism for viral marketing.

This further motivates the researchers to carry out extensive studies on various aspects of the influence propagation problem. *Influence Maximization problem* is a problem of finding a small set of nodes that maximizes the spread of influence. Influence Maximization problem was first studied by Domingo's and Richardson[2] and proposed first algorithm for influence propagation.

Then, Kempe et al.[3] gave two fundamental propagation models, named Independent Cascade (IC) Model and Linear Threshold (LT) Model. Many other researchers extended this basic propagation models in terms of scalability and efficiency.

But most of the works focussed on a single online social network whereas users now often are found in more than one social network. Dung T. Nguyen et. Al [10] proposed an algorithm to handle this problem.

II. RELATED WORK

Probabilistic Model

Domingo's and Richardson [2] gave the first algorithm to deal with influence propagation problem. They built probabilistic models of influence for mining the data on *knowledge-sharing websites*. Knowledge-sharing sites are the sites where customer review products and advise each other about the products. Customer's have two types of values:

intrinsic value and *network value*. Intrinsic values of a customer is his values as a customer based on the products he is likely to purchase and the network value of a customer is high when he is expected to have a very positive influence on other's probabilities of purchasing the product. A customer with high network values is the one who is worth of marketing.

It concluded that by building the *probabilistic models* and applying those models to the knowledge sharing websites, solved the influence propagation problem and their method is scalable to large networks. But, the method mined a network from single source and not from multiple sources.

The model was built based on Epinions data. The model was first tested with respect to Boolean Marketing. Experimental result showed that viral marketing resulted in profit increase over direct marketing and no marketing. The model which was introduced was linear model and it had tremendous speed over a non-linear model.

Then, the model was tested against Continuous Marketing, where viral marketing was advantageous over direct marketing. It was also showed that even with less network knowledge, viral marketing methods was better than direct marketing. The table shows the profit results for Boolean Marketing and Continuous Marketing scenario for various

Experimental investigation on dairy scum biodiesel on CI DI Engine Performance and pollutant Characteristics at different injection pressures

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Abstract - The aim of the present investigation is to extract the biodiesel from dairy scum oil and to evaluate the performance and emission parameters with standard diesel fuel. Dairy scum oil is treated with an adequate measure of CH3OH which required and quantity of sodium hydroxide as a catalyst which is accessible in bio-chemical laboratories. Transesterification process was adopted to produce biodiesel under an optimized reaction temperature of 60 ^{0}C , the reaction time of 85 minutes, the quantity of methanol to oil ratio (1:3), the concentration of sodium hydroxide (0.6% v/v). Experimental investigation were conducted in CI DI engine to check the performance and pollutant characteristics of methyl esters of dairy scum oil by varying the injection pressures as 160 bar, 180 bar, and 200 bar. The essential performance parameters such as specific fuel consumption, BTE and emission parameters such as CO, CO_2, HC, NOx are found out and contrasted the results of biodiesel with the regular diesel fuel. The dairy scum biodiesel can be used as an alternative fuel and the properties obtained were within the ASTM standards.

Keywords: Biodiesel, Dairy scum oil, Diesel engine , Emission, Performance, Transesterification.

I. INTRODUCTION

The trends in global energy consumption surveys depict that a main chunk of overall energy consumed is obtained from combustion of fossil fuels. Predominantly among fossil fuels, liquid petroleum-based fuels contribute significantly due to their distinct physico-chemical and combustion properties. But, the major concern here is liquid fuel reserves are limited and may exhaust any time, and their economic utilization is the fact bothering all researchers [1, 2]. Biodiesel is a renewable fuel obtained from animal fat or vegetable oil through a complex chemical process and can be employed as any direct substitute, extender or as an improver to fossil diesel fuel in CI engines [3]. The important factor is that biodiesel fuel could be directly used in existing automobile engines with a minute or no hardware modifications in engine design. These biodiesels are produced through a chemical reaction of animal fat or vegetable oils with methanol/ethanol in the occurrence of a catalytic agent to make glycerol as a main byproduct [4-8]. Biodiesel chemical name is methyl or ethyl ester. Sivakumar et al.

[9] used dairy scum oil with an alkali-catalyzed transesterification process to produce biodiesel of waste dairy scum oil by using gas chromatography test and obtained maximum biodiesel yield of 96.7% by using 6:1 molar ratio, KOH of 1.2% wt at a stirring speed of 350 rpm, 30minutes of reaction time and a reaction temperature of 75 ^{0}C.The measured physicochemical properties are within the ASTM standards.Banapurmath et al. [10] BTE for methyl esters of pongamia oil, sesame oil jatropha oil, and conventional diesel fuel was 29.51%, 30.4% and 29% and 31.25%.Emissions for HC and CO were more than that of traditional diesel fuel. Canakci et al. [11] by using the methyl esters of canola oil and waste palm oil, the brake power lowered by 4% to 5%, BSFC increased by 9% to 10%. Emissions such as THC 17% to 26% depressed, CO2 reduced by 5% to 8%, smoke opacity reduced by fifty-six to sixty-three percentage, NOx increased by eleven to twenty-two percentage over conventional diesel fuel. Buyukkaya et al. [12] concluded that by using rapeseed biodiesel blends there was a reduction in peak pressure by 55 bar, maximum HRR reduction by 14%, IDT (ignition delay time) found to be a

A New Approach for Evaluation of Volume Integrals by Haar Wavelet Method

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Abstract

This paper presents, Numerical integration rule based on Haar wavelets method are proposed to find volume integrals of various region such as cuboids, tetrahedron, cone, cylinder, ellipsoid, sphere, etc., volume integral region are transformed to standard integrals by linear and non linear transformation method, the advantage of this method gives the efficiency and simple applicability, performances of this method is illustrated with numerical examples.

Keywords: *Numerical Integration, Haar wavelet method, Volume*

1. Introduction

Analytical / numerical integration of functions over three dimensional regions or finding volume of various region often arises in chemical engineering, electromagnetic, field theory, fluid mechanics, biomechanics, bioinformatics. etc. mathematical modeling and computer simulation are applicable for biological system in the form of partial differential equation are to be solved by finite element method, to extract the stiffness matrix in the form of integral equations. In particular they are used for problems arriving in calculation of volume, moment of inertia, center of mass, volume of potholes and other geometric properties of solids. Numerical integration of triple integrals over various region are carryout by many authors, cuboids [Shivaram, 2014, Sarada and Nagaraja, 2015, Fengying Zhou, et.al.2017], tetrahedral region [Rathod et.al. 2005, 2007, 2010,Shivaram, 2013, Mamtha and Venkatesh, 2015, Fengying Zhou, et.al.2017], cone , cylinder, ellipsoid, paraboloid [Sarada and Nagaraja, 2015, Fengying Zhou, et.al.2017], Spherical region [Shivaram, 2013, Sarada and Nagaraja, 2015, Fengying Zhou, et.al.2017], numerical integration of multiple integrals by using Haar wavelet and hybrid functions are discussed in [Siraj ul Islam et.al., 2010, 2012, Imran Aziz, et.al. 2011], In This paper, we apply the wavelet based integration technique of Haar wavelet method over various region, this method is more accurate and easy to implement for variety of problems arising in science and engineering, the necessary computer program has been developed in MAPLE

The paper is organized as follows. In Section 2. mathematical preliminaries required for understanding the derivation, In Section 3. by using transformation method to convert the volume integral into standard integrals, In Section 4. We compare the numerical results with exact value.

2. Mathematical Preliminaries

2.1 Haar Wavelets method

The explicit form of the function $H_{jk}(x)$ is defined as

$$H_{jk}(x) = \begin{cases} 1, & if \ x \in [a_{jk}, \frac{a_{jk}+b_{jk}}{2}) \\ -1, & if \ x \in [\frac{a_{jk}+b_{jk}}{2}, b_{jk}) \\ 0, & otherwise \end{cases} \quad (1)$$

Where $j \geq 0$, $k = 0,1,2, - - -, 2^j - 1$
$a_{jk} = \frac{k}{2^j}$ and $b_{jk} = \frac{k+1}{2^j}$

Using the orthogonal basis of $L^2([0,1))$ the Haar wavelet function $H_{jk}(x)$ can be expressed by Haar series function $f(x)$ of infinite terms as

$$\int_a^b f(x)\, dx = \frac{(b-a)}{2^{n+1}} \sum_{i=1}^{2^{n+1}} f(a + \frac{(b-a)(2i-1)}{2^{n+2}}) = \frac{(b-a)}{2M} \sum_{i=1}^{2M} f(a + \frac{(b-a)(i-0.5)}{2M})$$

Where $M = 2^n$
For triple integral

$$\int_{a_1}^{a_2} \int_{a_3}^{a_4} \int_{a_5}^{a_6} f(x_1, x_2, x_3) dx_1 dx_2 dx_3 = ,$$

$$\frac{(a_2-a_1)(a_4-a_3)(a_6-a_5)}{8M^3} \sum_{i_1=1}^{2M} \sum_{i_2=1}^{2M} \sum_{i_3=1}^{2M} f(A, B, C) \quad (2)$$

where $A = a_1 + \frac{(a_2-a_1)(i_1-0.5)}{2M}$, $B = a_3 + \frac{(a_4-a_3)(i_2-0.5)}{2M}$,
$C = a_5 + \frac{(a_6-a_5)(i_3-0.5)}{2M}$

we shall be using these formula to evaluate the volume integral by Haar wavelet method

2.2. Volume Integral over xyz – plane

In this section is devoted to the numerical integration of arbitrary function over sphere, cylinder, cuboids, cone, ellipsoid,tetrahedral region is of the form
Region $R = \{(x,y,z) | a \leq x \leq b, f_1(x) \leq y \leq f_2(x), g_1(x,y) \leq z \leq g_2(x,y)\}$ having linear or non linear faces are plotted in figure.1

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A simple and efficient wavelet approach for evaluating surface integral over curved domain

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Abstract

This paper presents, a simple and efficient wavelet approach for computing the surface integrals over irregular or curved domain, the limit of the integrals are nonlinear function are transformed to standard two square by using finite element basis function, Haar wavelet based integration technique is applied to evaluation of surface integral over curved domain, the computational efficiency of the method is illustrated with several numerical examples.

Keywords: Numerical Integration; Hear Wavelet Method; Curved Domain

1. Introduction

Numerical integration appears in many fields of science and engineering, to finding surface area, volume, length, momentum, mass, stiffness matrix, mass matrix, body force vector etc., In recent years wavelet bases integration approach is morepopular in the field of numerical approximation of surface and volume integral. From the literature review we may realize that a lot of works have been done in this area in terms of quadrature rule of numerical integration, A number of polynomial based Gauss Legendre quadrature rule, product of polynomial and logarithmic based Generalized Gaussian quadrature methodover various region have been discussed, such as triangle region [1-2], quadrilateral region [3], parabolic region [4], square region [5], circle [6], etc., numerical integration of arbitrary function over convex and non-convex region are evaluated numerically by cubic spline element method [7], convex and non convex region is divided into 4-node, 8-node quadrilateral elements are approximated Numerically in [8-9], very limited work is attempted in curved domain, recently numerical integration of arbitrary function over parabolic edges by Generalized Gaussian Where and Using the orthogonal basis of the Haar wavelet function can be expressed by Haar series function of infinite terms as Where For double integraldivided into 4-node, 8-node quadrilateral elements are approximated numerically in [8,9], very limited work is attempted in curved domain, recently numerical integration ofarbitrary function over parabolic edges by Generalized Gaussian quadrature rule are carryout by [10], In this paper, we use Haar wavelet method to approximate the surface integral over curved domain or irregular domain.

2. Mathematical preliminaries

2.1. Hear Wavelet method

The explicit form of the function is defined as

$$
H_{jk}(x) = \begin{cases} 1, & if \quad x \in [a_{jk}, \dfrac{a_{jk}+b_{jk}}{2}) \\ -1, & if \quad x \in [\dfrac{a_{jk}+b_{jk}}{2}, b_{jk}) \\ 0, & otherwise \end{cases} \tag{1}
$$

Where

$$ j \geq 0, \quad k = 0,1,2,---,2^j - 1 $$

$$ a_{jk} = \frac{k}{2^j} \quad and \quad b_{jk} = \frac{k+1}{2^j} $$

Using the orthogonal basis of $L^2([0,1))$ the Haar wavelet function $H_{jk}(x)$ can be expressed by Haar series function f(x) of infinite terms as

$$ \int_a^b f(x)dx = \frac{(b-a)}{2^{n+1}} \sum_{i=1}^{2^{n+1}} f(a + \frac{(b-a)(2i-1)}{2^{n+1}}) $$

$$ = \frac{(b-a)}{2M} \sum_{i=1}^{2M} f(a + \frac{(b-a)(i-0.5)}{2M}) $$

Where $M = 2^n$

For double integral

$$ \int_{a_1}^{a_2} \int_{a_3}^{a_4} f(x_1, x_2) dx_1 dx_2 = \frac{(a_2-a_1)(a_4-a_3)}{4M^2} \sum_{i_1=1}^{2M} \sum_{i_2=1}^{2M} f(A,B) \tag{2} $$

Where

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Design Implementation and Analysis of non linear system based power quality using LabVIEW.

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Abstract:

In the present scenario the increasing existence of nonlinear loads and the increasing number of distributed generation power systems in electrical grids change the characteristics of voltage and current waveforms, which differ from pure sinusoidal wave. Poor power qualities affect functioning of utilities, different industrial units, productions, customer services and other system performance and operating costs. Monitoring of power quality is essential to maintain proper functioning of utilities, customer services and equipment's. The target here is to design measuring systems and display the system parameters under distorted system conditions. Harmonics are measured and displayed using LabVIEW. The voltage and current are sensed using sensors for various loads, which are then interfaced with the PC using DAQ (Data Acquisition) card and displayed using LabVIEW. The Hardware implementation includes setting up of test systems such as diode bridge rectifier and thyristor-based converter with various loads.

Key word: DAQ, LabVIEW, Power qualities, Harmonics.

Introduction

The aim of the power system has always been to supply electrical energy to customers. Earlier the consumers of electrical energy were mere acceptors. Interruptions and other voltage disturbances were part of the deal. But today electric power is viewed as a product with certain characteristics which can be measured, predicted, guaranteed, improved etc. Moreover, it has become an integral part of our life. Modern world is heavily dependent on the constant and reliably availability of electrical power supply. In the recent years, users of electric power have detected an increasing number of drawbacks caused by electric power quality variations. These variations already existed on the electrical system but only recently they are causing serious problems. This is due to the increased sensitivity of equipment's and devices used by customers. This end user equipment's are more interconnected in networks and industrial processes, that the impact of a problem with any piece of equipment is much more severe.

Now the quality of this power supply is becoming more important due to increasing sensitivity of the equipment's and devices used by the customers. Also, power quality of power systems affects all connected electrical and electronic equipment's and is a measure of deviations in voltage, current, frequency, temperature, force, and torque of particular supply systems and their components.

Sustainable Energy is the provision of energy such that it meets the needs of the future without compromising the ability of future generations to meet their own needs. It is required to have more efficient means of converting and utilizing these energies. This will depend on the quality of power supplied and the impact of end user equipment's on that power

Power quality monitoring can help to identify the cause of power system disturbances and even help to identify problem conditions before they cause interruptions or disturbances. Hence to improve power quality with adequate solutions, it is necessary to know what kinds of disturbances occurred.

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Design & Development of Optimum Load Shedding with Voltage Stability Indicators in Power System

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Abstract:- **Optimal load shedding strategy for power systems with optimum location and quantity of load to be shed is presented. The problem of load shedding for avoiding the existence of voltage instability in power systems is taken as a remedial action during emergency state in transmission An and distribution sector. Optimum location of loads to be shed is found together with their optimum required quantity. The optimum load shedding in power strategies with voltage stability indicators is a simple new method is developed to determine the optimum location and the optimum quantity of load to be shed in order to prevent the system voltage from going to the unstable. This method is based on indicators of risk of voltage instability. It can be implemented for large power system to estimate voltage instability. Successive load flow runs are required to accomplish this method. The proposed method can be used for real time applications in power systems. The computation speed of these indicators is fast compared to other methods.**

Keywords— Load shedding; voltage stability; labview; voltage indicators;

I. INTRODUCTION

Electrical load shedding is a method of reducing the demand on the electricity generation and achieved by switching off some loads or energy supply to some geographical areas. This is usually a last measure by the utilities, and often implemented to prevent overloading the generating systems and eventual collapse of the entire power system.

Load shedding is one of the last things that a utility company should look at. It leads to frustrated customers and loss of revenue for the consumers as production drops. In addition, it may cause equipment damage.

Electricity companies should ensure that they have enough capacity to meet normal and peak demands. This can be achieved by planning for future electricity demand and progressively upgrading the generating equipment, maintain existing systems, reducing transmission losses and increasing efficiency in the entire system.

Power companies are required to supply sufficient energy to meet installed capacity. However, the demand may become inconsistent during peak periods. Whenever the power generated is insufficient to support the load, the electrical supply and distribution system becomes unbalanced and unstable.

If not controlled, the system can collapse and cause a total blackout. In such a situation, it may take hours or days to restore back the power. The utility monitors their systems and compare the load against the supply. If the difference between the two gets very narrow, some of the sections are disconnected so as to prevent the system from becoming unstable.

II. VOLTAGE STABIITY

Voltage stability is the ability of a power system to maintain steady acceptable voltages at all buses in the system under normal operating conditions and after being subjected to a disturbance.

Severe and increasing strain has been observed in the power system in recent years due to incongruence between the generation and transmission infrastructure. Environmental issues, change in energy portfolio and deregulated energy markets are some of the prime factors. The kind of stress developed in the system has caused concerns for voltage instability. Voltage stability refers to the ability of a power system to maintain steady voltages at all buses in the system after being subjected to a disturbance from a given initial operating condition.
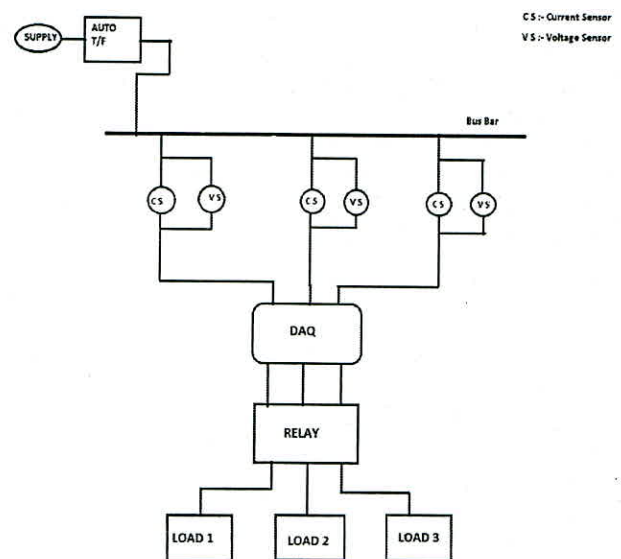
III. FLOW DIAGRAM

Fig. 1. Flow diagram.

CS-current sensor

VS-voltage sensor

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