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3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the last five years (10)

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Optimization of delay and temperature for improved design flow in 3D IC	Simi P Thomas	ECE	IJCSE	Dec-16			https://www.ijcseonline.org/archive_issue.php?pub_id=42	UG
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Improving load balance in Wireless Network using Spatial Reusability	,Neena Joseph,	CSE	IJCSE	Dec-16			https://www.ijcseonline.org/archive_issue.php?pub_id=42	UG
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Cycle Time and Idle Time Reduction in an Engine Assembly Line

Amith J Prakash
PG Scholar
Department of Industrial Engineering & Management
Mangalam college of Engineeering Ettumanoor

Aneesh K S
Associate Professor
Department of Mechanical Engineering
Mangalam college of Engineeering Ettumanoor

Abstract

This paper focuses on productivity improvement of a tiller assembly line by using operational analysis and assembly line balancing .The existing standard time in the assembly line is too old and inaccurate. A proposal of new standard time has been given to reduce the ineffective time. A heuristic method called Ranked Positional Weighted method is used for assembly line balancing. After the analysis of the existing time required for each tasks non value added time, value added time and production time has been found using stop watch time study. Micro motion study is done to find the ineffective time in each operation.
Keywords: Idle Time, Standard Time Cycle Time, Line Balancing

I. INTRODUCTION

An important problem faced in the production system is that of determining the time it takes to produce a unit of product, in order to thoroughly analyze the problem, the production process for each of product is analyzed. For every manufacturing organization, price of the product primarily compromises of manufacturing cost and desired profit. If a company wishes to increase its profit, one way is to reduce the manufacturing cost with maintaining the quality of the product. Waste reduction, especially the time waste, is an important factor to reduce the manufacturing cost.

II. NEED FOR LINE BALANCING

In an Assembly Line if the workers are not utilized effectively then it results in less efficiency. If the Cycle Time of one work station is high them it will affect the production rate of the whole product, if the line balancing is done in the assembly line. It will result in smooth functioning of the plant without bottleneck. Here this paper focus to do Assembly Line Balancing by heuristic method Rank Position Weighted method (RPW)

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Sustainable Traffic Improvement forUrban Road Intersections of Developing Countries: A Case Study of Ettumanoor, India

Geethu Lal[a,*], Divya L. G.[a], Nithin K. J.[a], Susan Mathew[a], Bennet Kuriakose[a]

Mangalam College of Engineering, Ettumanoor 686631, India

Abstract

The spectacular increase of number of motor vehicles on the road is mainly attributed ingeneration oftraffic problems like accidents, congestions, delays etc., especially in the urban premises of developing countries. This paper examines the traffic problems and sustainable improvement ofroadintersection at Ettumanoor, India. The spacial and temporal constitutions of the vehicle as well as pedestrian traffic at the intersections were examined and the characteristics of the junction indoctrinating the delay problems are identified. Data regarding the traffic volume, land use and pedestrian movement activities are collected through direct field surveys. Analysis of the collected data revealed that the improper planning of the junctions, lack of traffic signals and unauthorised parking are the major factors contributing to the traffic congestions. Various remedial measures are also proposed, focusing on junction improvement, alternative operation plan and junction signalisation.

Peer-review under responsibility of the organizing committee of RAEREST 2016

Keywords: Traffic congestion; intersections; traffic volume; traffic delay; junction signalisation.

1. Introduction

India is urbanising in a rapid rate and the absolute increase of population is more in the urban areas (9.1%) than in the rural areas [1] during the period 2001-2011. The urban population of India is estimated to be 37.7 crore. The quick urbanisation has resulted in enhanced travel demands and thereby an increase inurban transport problems.The urban traffic problems are attested with traffic congestions, accidents, unauthorised parking, poor land use, inadequate transport planning as well as poorly maintained road networks. Accounting for the colligationof social

* Corresponding author. Tel.: +91-481-2710120.
E-mail address: lalgeethulal@gmail.com

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Numerical Analysis of Thin Plates with Holes

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Numerical Analysis of Thin Plates with Holes

Gokul P. V. [1, a*], Bennet Kuriakose [2, b] and Salini Theres N. Kurian [1, c]

[1]Department of Civil Engineering, Mangalam College of Engineering, Ettumanoor – 686 631, India.
[2]Department of Civil Engineering, Indian Institute of Technology Madras, Chennai- 600 036, India.

[a]gokulpv1994@gmail.com, [b]abdulmasih@gmail.com, [b]salini.kurian@mangalam.in

Keywords: Stress concentration, ANSYS, pitting corrosion, residual strength.

Abstract. Plates are the important structural members finding applications in the field of structural engineering, ship technology and aerospace engineering. Holes are often provided in the plates for the purpose of services and aesthetics. Pitting corrosion can also induce holes on the plates, thereby inducing stress concentration and redistribution of stress around the hole. In this paper, the popular finite element software ANSYS is used for the static analysis of thin plates with holes. The influence of shape and size of the hole on the stress distribution of plate is also analysed. The study can form foundation for strength assessment of steel plates with holes, especially residual strength of plates subjected to pitting corrosion.

Introduction

Metallic plates have found wide spread applications in the field of aerospace, marine and automobile engineering. Holes are often induced in steel plates as the reason of pitting corrosion and the presence of holes in the plates can result in the stress concentration, stress redistribution, reduction in strength, abrupt dynamic responses as well as changes in the buckling characteristics, necessitating rigorous contemplation.

So far, many researchers have attempted analysis of plates subjected to axial loading. Kirsch [1] developed analytical equations for stresses within the proximity of a circular hole in a plate of infinite length subjected to inplane uniaxial loading. Gunwant *et al.* [2] investigated the stress distribution in a continuous elastic plate with a central elliptical hole. Mirji [3] employed finite element technique to assess stress distribution within a rectangular plate with two holes, subjected to in-plane load. Diany [4] developed stress concentration factors for a plate with holes of different shapes and orientations. Nagpal *et al.* [5] attempted investigations on stress concentration around the holes and notches in both isotropic and orthotropic plates, subjected to in-plane or transverse loading conditions. The effect of presence of cut outs in plates with various shaped cut outs were studied by Watsar *et al.* [6]. Similar studies are also reported from Mekalke *et al.* [7], Saraçoğlu and Albayrak [8], Jain [9] and Vanam *et al.* [10]. Moreover, few researchers have attempted studies on plates with holes created as the reason of pitting corrosion [11],[12].

In this paper, a study on stress pattern in an isotropic steel plate with holes subjected to uniaxial loading is presented, as part of an initial step in addressing behaviour of plates subjected to random pitting corrosion. The popular finite element software ANSYS is employed in the present study. The numerical model is validated using the classical Kirsch problem [1]. A detailed parametric study is also presented to assess the behaviour of the steel plate with shape of the hole, size of the hole as well as distance between two holes in proximity.

Method of Analysis

Stress values which are much higher than the applied average stress is observed within the proximity of a hole in a stressed plate. These magnified stress values are often known as stress concentration and is defined as localisation of high stresses due to the irregularities present in the component and abrupt changes of the cross-section [2]. In order to assess this issue, it is worthy to define a Stress Concentration Factor (SCF) with the ratio of maximum stress and the average stress. Kirsch [1] proposed stress concentration factors of 3P and –P around a circular hole in an axially loaded thin plate as shown in Fig. 1, where P is the applied average stress.

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Static Analysis of Gravity Dams Considering Foundation-Structure Interaction

Margaret Abraham[1, a*], Bennet Kuriakose[2,b] and Reni Kuruvilla[1,c]

[1]Department of Civil Engineering, Mangalam College of Engineering, Ettumanoor – 686 631, India.
[2]Department of Civil Engineering, Indian Institute of Technology Madras, Chennai - 600 036, India.

[a]margaretabraham226@gmail.com, [b]abdulmasih@gmail.com, [c]reni.kuruvilla@mangalam.in

Keywords: Foundation-structure interaction, structural analysis, failure analysis, numerical model.

Abstract: A dam is an artificial barrier constructed across a stream channel to impound water. Analysis of stresses and displacements are inevitable for the structural design and failure analysis of dams. This paper deals with the numerical simulation of structural response of gravity dams, duly considering the foundation-structure interaction. The optimum depth and width of foundation extend to be considered in the numerical model is also studied. A parametric study based on the stiffness of the foundation is also exercised. As an application of the developed model, a case study of Peechi gravity dam is presented. This study proved the importance of consideration of foundation-structure interaction in the structural analysis of dams. The developed numerical model can be further improved, for performing seismic analysis of gravity dams, considering the foundation-structure as well as fluid-structure interactions.

Introduction

Gravity dams are solid structures that use its own self weight and geometric form to resist the hydrostatic forces and other external loads acting on it. The foundation type, nature of foundation, sediments deposited, reservoir conditions etc. influences the structural response of the dam. The safety and serviceability of the dam can be ensured by studying various factors affecting the response of the dam structure. A clear insight into the response of the structure can be gained from the stress analysis of the dam.

Several researches have conducted analysis of gravity dams utilising the finite element (FE) method. Classically, 'gravity method' is used for stress analysis of gravity dams [1]. Westergaard [2] studied the effect of reservoir on the dam based on the assumptions that, water is incompressible; dam is rigid with its face is vertical. Burman *et al.* [3] conducted a time domain transient analysis of concrete gravity dam and its foundation in a coupled manner using FE technique. Fenves and Chopra [4] studied the effect of seismic waves on the response of a dam by means of absorbing boundary conditions. Decoupled model approach was proposed by Lofti [5] for earthquake analysis of a gravity dam.

The aforementioned studies cease to take the effect of embedding foundation into consideration in order to assess the structural response of gravity dams. Foundation-structure interaction (FSI) is often recognised as rigorous as they take into account the effect of flexible foundations also. In this paper, ANSYS software is employed for finite element modeling and analysis of dams considering FSI. A parametric study to assess the response of the dam with variation in stiffness of the foundation is also performed. The developed finite element model is utilised to analyse the stresses within Peechi dam as a case study.

Nonlinear Finite Element Analysis of Unreinforced Masonry Walls

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Nonlinear Finite Element Analysis of Unreinforced Masonry Walls

Feba S. Thomas[1, a *] and Bennet Kuriakose[2, b]

[1]Department of Civil Engineering, Mangalam College of Engineering, Ettumanoor – 686 631, India

[2]Department of Civil Engineering, Indian Institute of Technology Madras, Chennai - 600 036, India.

[a]febu3001@gmail.com, [b]abdulmasih@gmail.com,

Keywords: Masonry, numerical model, macro-modelling, risk assessment, retrofitting.

Abstract. Most of the monumental structures worldwide and residential structures in developing countries are built in masonry. The studies performed by various researchers prove the vulnerability of masonry structures under various circumstances, especially under earthquakes, so as to necessitate detailed contemplation. In this paper, a numerical model for nonlinear static analysis of unreinforced masonry walls is developed based on a macro-modelling approach. A detailed parametric study is also performed to analyse the effect of wall thickness as well as length on the behaviour of the masonry wall. The present numerical model can be utilized for risk assessment and seismic retrofitting of historical masonry structures.

Introduction

Masonry is one of the oldest, but still widely used construction method. Modelling and analysis of masonry structures are challenging because of the heterogeneous nature and nonlinear behaviour. The studies on past earthquakes have significantly proven that the major loss of lives happened due to the catastrophic destruction of masonry buildings. Conservation of monumental structures built up of masonry is recently gaining attention worldwide. Improvement in seismic behaviour of masonry structures by retrofitting requires detailed analysis of the structure taking into account all the nonlinear behaviour like cracking, creep, crushing, etc. The importance of detailed study and analysis of masonry is hereby reasoned.

Masonry walls are major components in masonry constructions. Various experimental studies on masonry walls are reported in the literature [1-3]. Experimental testing of masonry structures is difficult due to the variations in material properties as well as wide range of in-situ properties and obviously there exists a difficulty in reproducing these properties in a single experimental specimen [4]. Therefore, numerical simulations of masonry structures have gained wide acceptance among the researchers [5-11]. Lorenço and Rots [5] analysed masonry structures with interface elements using micro model and the developed model was able to capture all failure mechanisms. An anisotropic model was proposed by Lorenço [6] which could predict behaviour of masonry walls with brittle and ductile failure modes. A Romanesque masonry church in central Italy was modelled and analysed for seismic resistance by Betti and Vignoli [7]. Using Bounce and Wen model, a simplified but effective time history analysis of masonry structures based on simplified equivalent single degree of model was proposed by Betti et al. [8]. Facchini and Betti [9] performed a seismic analysis on disordered masonry tower using finite element packages, ANSYS and Code-Aster. Assessment of in-plane behaviour of unreinforced masonry with a parametric study considering the aspect ratio, vertical as well as horizontal post-tensioning was performed by Farshchi et al. [10].

Analysis of historical masonry is always found to be a difficult task because of the large number of factors that influence the structure, which remains unknown. This difficulty occurs because of the fact that material resources happen to be absent due to the decay of masonry as a structural material and the lack of methodologies for standardisation of the masonry [11]. This paper aims to study the behaviour of a masonry wall based on a simple numerical model developed in ANSYS. A parametric study is also presented in order to monitor the variation of response of the wall with length, height and thickness of the wall.

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Vibration Control of Cantilever Beam with Multiple Cracks

Geethu Lal[1], Alice Johny[2]

P. G. Scholar [1], Assistant Professor [2]

Department of Civil Engineering

Mangalam College of Engineering

Ettumanoor, Kerala

India

ABSTRACT

Cracks often develop in structural members and cracking can cause serious durability issues as well as structural damage. Cracks influence dynamic characteristics of the structural members and have been the subject of many investigations. In the present work, a numerical study using finite element method is performed to investigate the transverse free vibration response of a cracked isotropic cantilever beam using ANSYS. A parametric study is also carried out to assess the influence of crack depth ratio, location of cracks and number of cracks on the first three natural frequencies of the beams. Vibration control studies are also carried out. The results can be utilised to locate cracks and cracking intensity within a remote or massive structure by real-time monitoring of ambient vibration data.

Key Words: *Cracking, Dynamic Characteristics, Free Vibration, Vibration Control, ANSYS, Natural Frequencies.*

I. INTRODUCTION

Cracking is inevitable in civil engineering structures, and if exceeded the limits, can cause structural damage as well as adversely affect the serviceability and durability. The presence of cracks in the structural components can have a significant influence on the dynamic properties of a structure. Early identification of cracking in structural members is essential in engineering practice, and is achievable by identifying the change in dynamic properties of the members. Vibration control is defined as a technique in which the vibration of a structure is reduced or controlled by applying counter force to the structure that is appropriately out of phase but equal in amplitude to the original vibration

Many studies on dynamic behaviour of cracked beams have been reported in the literature. Location, depth and intensity of cracking can be reckoned by interpreting the changes in natural frequencies [5]. Behzad et al. [3] presented a study on vibration analysis of a cracked beam, wherein, the equations of motion and corresponding boundary conditions for bending vibration of a beam with an open edge crack was developed by implementing the Hamilton principle. Chondros and Dimarogonas [4] developed a continuous cracked bar vibration model for the lateral vibration of a cracked Euler-Bernoulli cantilevered beam with an edge crack. Kisa and Brandon [8] used a bilinear stiffness model for taking into account the stiffness changes of a cracked beam in the crack location. Pawar and Sawant [11] developed the study of the vibration analysis of cracked cantilever beam subjected to free and harmonic excitation at the base. Zheng [18] studied the natural frequencies and mode shapes of a cracked beam, employing the finite element method. Zsolt [19] analysed quasi periodic

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Deflection Control of Cantilever Beams with Multiple Cracks

Geethu Lal[1] & Alice Johny[2]
[1]P. G. Scholar
[2]Assistant Professor

Abstract: Cracks often develop in structural members and cracking can cause serious durability issues as well as structural damage. Cracks influence dynamic characteristics of the structural members and have been the subject of many investigations. In the present work, a numerical study using finite element method is performed to investigate the transverse static analysis of a cracked isotropic cantilever beam using ANSYS. A parametric study is also carried out to assess the influence of crack depth ratio, location of cracks and number of cracks on the deflection. The deflection control study was also carried out and explained in this paper.

1. Introduction

Cracking is inevitable in civil engineering structures, and if exceeded the limits, can cause structural damage as well as adversely affect the serviceability and durability. The presence of cracks in the structural components can have a significant influence on the static properties of a structure. Deflection can be calculated by standard formula calculated using Euler–Bernoulli beam equation, virtual work, direct integration, Castiglione's method and Macaulay's method or the direct stiffness method Early identification of cracking in structural members is essential in engineering practice, and is achievable by identifying the change in static properties of the members.

Active vibration control is defined as a technique in which the vibration of a structure is reduced or controlled by applying counter force to the structure that is appropriately out of phase but equal in amplitude to the original vibration. As a result two opposite force cancel each other and structure stops vibrating. These are known as passive a technique which uses springs, pads, dampers, etc have been used previously to control vibration. They have limitations but can control the frequencies within a short range of bandwidth. They are used as sensors and as actuators in structural vibration control systems. They provide excellent actuation and sensing capabilities. The ability of piezoelectric materials to transform mechanical energy into electrical energy and vice versa was discovered over a century ago by Pierre and Jacque Curie. These French scientists discovered a class of materials that when pressured, generate electrical charge, and when placed inside an electric field, strain mechanically. Many studies on dynamic behaviour of cracked beams have been reported in the literature.

Chaudhari and Patil [2] performed static analysis of un-cracked and cracked beam to find deflection and the results are showing the effect of crack in varying deflection. Dona *et.al* [5] a computational method was introduced for analysing the static and dynamic behaviour of a multi-damaged beam using local and non-local elasticity theories. Mahato *et.al* [9] studied the effect of point loading on the maximum displacement of simply supported beam and cantilever beam. Experiment was done by varying load values and results obtained were validated using close form and numerical approach. Majumder and Kumar [6] conducted finite element analysis of the beam considering various types of elements under different loading conditions in ANSYS. Mohsin [10] investigated the behaviour of center crack in a plate subjected to tensile loading. Tensile loading depends on the assumptions of Linear Elastic Fracture Mechanics (LEFM) and plane strain problem. Saavedra *et.al* [13] studied theoretical and experimental dynamic behavior of different beams with a transverse crack. Balmurugan and Narayanan [1] performed active vibration control of the piezolaminated smart composite plates is studied by modelling them with the above element and applying LQR optimal control based on full state feedback assumption. Crawley and Luis [3] explored the possibilities of using piezoelectric actuators and sensors in smart structures. Static and dynamic analytic models are derived for segmented Piezoelectric (PZT) actuators that are either bonded to an elastic substructure. Khalatkar *et.al* [7] investigated the influence of actuator location and configurations in order to identify the optimal configuration of the actuators for selective excitation of the mode shapes of the of cantilever plate structure. Kulkarni and Bajoria [8] studied the finite element formulation of a degenerate shell element, using higher order shear deformation theory considering the PZT effect. The static deflections of

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High Speed 32 Bit MAC using Reversible Vedic Multiplier and Kogge Stone Adder

[1]Saranya Mohan, [2]Rakesh S
[1]MTech student, [2]Assistant Professor
[1]Department of VLSI&ES, [2]Department of Electronics & Communication Engineering
Mangalam College of Engineering, Kerala, Kottayam, India

***Abstract*—A 32 bit multiply accumulator (MAC) using Vedic multiplier and Kogge stone adder for high speed application is shown in this paper. Multiply accumulators are extensively used in digital signal processing. Speed of MAC depends on multiplier and adder. Vedic multiplier reduces the number of partial products and it is designed using reversible logic gates which assure zero power dissipation. Reversible logic gates are absolutely necessary in the field of quantum computing and it is extremely important in low power applications. Kogge stone adder with an increment logic and carry skip logic are used as 64 bit adder which will considerably reduces the carry propagation delay. The MAC is designed in VHDL and simulation is done in Xilinx 13.2. FPGA implementation is also carried out.**

***Index Terms*— MAC, Vedic Multiplier, Reversible logic, Kogge stone adder.**

I. INTRODUCTION (HEADING 1)

Multiply accumulate operation is one of the basic arithmetic operations widely used in DSP applications.MAC is composed of an adder, multiplier and an accumulator. Vedic multiplier is used for the reduction of partial products and thus by reduces the speed and area. Vedic mathematics is a unique technique of calculations based on 16 sutras (algorithms).Urdhava triyagbhayam sutra is one such algorithm which enables parallel generation of intermediate products and thus eliminates unwanted multiplication steps. Addition is done by using Kogge stone adder. The Kogge stone adder is a parallel prefix adder since the generate and propagate signals are pre-computed.

In a tree based adder carrier is generated in tree and fast computation is obtained at the expense of increased area and power in addition, the delay of 64 bit adder is reduced by using a carry skip logic and incrementation block. Reversible logics are the extremely important in the emerging field of quantum computing and are used to get less power. In the accumulate adder the previous MAC output and the present output will added and it consists of multiplier unit, one adder unit and both will get be combined by an accumulate unit.

II. LITERATURE SURVEY

Multipliers

Due to the regular structure and wiring array multiplier takes up the least amount of area. But the repeated addition and shifting procedure makes it the slowest multiplier. Wallace tree algorithm can be used to reduce the number of sequential adding stages. The irregular structure of Wallace tree makes the layout more difficult. Though booth multiplier will reduce the number of partial products, it will increase the complexity of the circuit to generate partial product bit.

Adders

Slow additions directly affect the total performance of the computer. Ripple carry adder is the simplest and smallest adder design. The carry propagation delay of ripple carry adder makes it as the slowest adder. Carry select adders and carry look adders improves the performance but the design is very complex. Kogge stone adder is the fastest adder. But for the 64 bit adder in the 32 bit MAC, its design is very complex.

III. VEDIC MULTIPLICATION

Urdhva Tiryagbhyam (UT) algorithm is one among the 16 algorithms in Vedic mathematics. The basic idea behind the UT algorithm is that the generation of partial products and concurrent addition of these partial products. By using Vedic multipliers we can eliminate the complex partial product generation step in multipliers. The vertically and crosswise multiplication results in the elimination of shift operation used in partial product generation. Here the partial product calculation is done in single step and thus by we can reduce the power, area and delay of the multiplier. The main advantage of Vedic multiplier is that by using a 2×2 multiplier we can design a 4×4 multiplier.8×8 multiplier can be made from four 4×4 multipliers. Thus any higher order bit multiplier can be made easily by lower order multipliers. A 4×4 multiplier using four 2×2 multiplier is shown in fig4.The outputs from 2×2 multipliers are added by using ripple carry adders.

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Modified Low Power and High Speed Row and Column Bypass Multiplier using FPGA

[1]Amala Maria Alex, [2]Nidhish Antony

[1]MTech in VLSI & Embedded Systems,[2] Assistant Professor ECE Dept
Mangalam college of Engineering, Kerala, Kottayam, India

Abstract— **The demand for electronic portable devices is gaining more attention in recent decades. Portable devices are demanding for low power. Multiplier is the critical part of any arithmetic operation in many DSP applications. So it is essential to design multipliers that utilize less power and high speed of operation. One main aspect of low power design is to minimize switching activities to reduce dynamic power dissipation. So the proposed bypassing logic will reduce dynamic power dissipation as well as signal propagation delay. Row and column bypass multiplier is a new design which reduces switching activities with architecture optimization. The switching activity should not occur unnecessarily and it should be avoided by bypassing. The adders corresponding to those rows and columns which are required to be bypassed need not get activated and signal get bypassed to the further stage. With the help of tristate buffer as a control gating element, unnecessary signal propagation can be stopped. Thus the unwanted switching activity can be reduced. The proposed multiplier design is efficient in terms of power by 20% or more when probability of occurrence of zero is more. These features make the proposed design more suitable for DSP applications like filtering, DCT and FFT.**

Index Terms—**FFT-Fast Fourier Transform,DSP-Discrete Cosine Transform,DSP-Digital signal processing,CSM-Carry Save Multiplier, CSA-Carry Select Adder, ADPCM-Adaptive Differential Pulse Code Modulation, QC-Quantum Cost, GO-Garbage Output, NC-Number of constant input.**

I.INTRODUCTION

The multiplier is the most critical arithmetic unit in many DSP applications such as digital filtering, fast fourier transform and discrete cosine transform. There is a need to design multipliers that reduce power dissipation and signal propagation delay. DSP applications like filters require faster calculations for updating their coefficients. Multipliers and their associated circuits (adders and accumulators) along with registers consume a significant portion of power for most of the DSP applications. Therefore, it makes sense to increase their performance by customization and architecture optimization [1]. So in this work I am adopting bypassing technique and it is almost critical design. This bypassing technique would result into much lesser power consumption even though architecture is bigger than the usual. This technique also reduces delay and quantum cost of the design. This bypassing technique does low power design at architecture level. In CMOS circuits, the power consumption can be classified into static power dissipation and dynamic power consumption. The expression for total power is given by,

$$P = \alpha f_c C_L VDD^2 + I_{SC} VDD + I_{leakage} VDD \qquad (1)$$

The first term represents dynamic power consumption which is dominant among both and the rest represents static power consumption. Static power dissipation is due to leakage current and dynamic power dissipation is due to charging and discharging of the load capacitances. Equation (1) gives total power consumption where, α is the switching activity, f_c is the clock frequency, CL is the load capacitance.VDD is the supply voltage, I_{SC} is the short circuit current and $I_{leakage}$ is the leakage current. As the switching activity (α) of the circuit increases dynamic power consumption will also increases. This power consumption can be reduced by minimizing the unnecessary switching activity. Bypassing scheme is the technique to avoid unnecessary switching activity. Bypassing scheme disables the switching activities in some rows and columns to reduces the switching power consumption. In addition to reduction in power consumption it is also beneficial in reducing the propagation delay. The concept of power saving by employing bypassing mainly depends on switching probability. Higher the probability better power reduction is possible. In normal multipliers the probability of input bit is 'zero' occurrence is uniform for normal distribution. But, it may vary for real time application which is having random distribution. While implementing multiplier in applications like DCT,ADPCM it is required to analyze 'zero' bit input data for amount of power reduction[1].

II. EXISTING WORK

Conventionally multipliers are iterative type multipliers and array type multipliers. Iterative type multipliers use same hardware with series of add and shift operation for the computation of multiplication. Reuse of hardware is possible but it requires more clock cycles to initiate addition operation of common hardware. Pipelining is possible because of repeated, compact and simple structure. Here the structure is regular so that layout is favorable for realizing parallel processing. All partial products are generated after one AND gate delay and more summed up sequentially using array of full adders

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Drip Irrigation and monitoring based on raspberry pi and arduino

[1]Piya Susan Punnen,[2] Prof. Mrs Jyothisree K R

[1]Mtech Student,[2] Associate Professor
[1,2]Electronics and communication,
[1,2]Mangalam College of Engineering, Kottayam, India

Abstract— **Drip irrigation, is an irrigation method that saves water and fertilizer by allowing water to drip slowly to the roots of plants. This paper proposes a smart drip irrigation system which can be used to schedule drip irrigation based on raspberry pi and arduino. The scheduling can be done via a website which is hosted on the raspberry pi. Also scheduling can be done by sending email with a particular subject format to a particular email id. The water level in the tank used for drip irrigation is maintained by using a solenoid valve which is controlled by the arduino. This system can be used to monitor the temperature, relative humidity and moisture of the soil of the plants via different sensors controlled by arduino and they are sent to the raspberry pi via zigbee wireless protocol and they are plotted against time and shown on the website. This enables the user to schedule the drip irrigation based on the reported changes in temperature, humidity and moisture. This makes it a very effective drip irrigation system.**

IndexTerms— **drip irrigation; raspberry pi; python; flask; arduino,zigbee.**

I. Introduction

This paper describes a smart drip irrigation system. Drip irrigation system makes the efficient use of water and fertilizer. Water is slowly dripped to the roots of the plants through narrow tubes and valves. Water is fed directly to the base of the plants which is a perfect way to water plants. There should be proper drainage in the fields or pot plants to avoid any water logging which in case may affect the productivity [1]. This paper presents a drip irrigation system to water and monitor plants with the use of devices like raspberry pi, Arduino microcontrollers. Xbee is used for the wireless communication between the raspberry pi and the arduino. Python programming language is used in the raspberry pi to communicate using xbee and for scheduling the automation. The website for scheduling is constructed using flask, mysql and python. This system once installed has no maintenance cost and is very easy to use .The sensor for temperature, humidity and moisture gives the user a real picture of the variation in these parameters via the different graphs on the website. Based on these values the user can decide the optimum time and duration for watering the plants.

II. MAIN COMPONENTS OF THE SYSTEM

The main components of the system are the raspberry pi, arduino and zigbee and the humidity and moisture sensors.

Central Component

Raspberry pi is a pocket personal computer with Linux operating system installed on it. This is super cheap to encourage young people for learning, programming, experimenting and innovation. Resembling like motherboard, raspberry pi has all the components to connect inputs, outputs and storage.

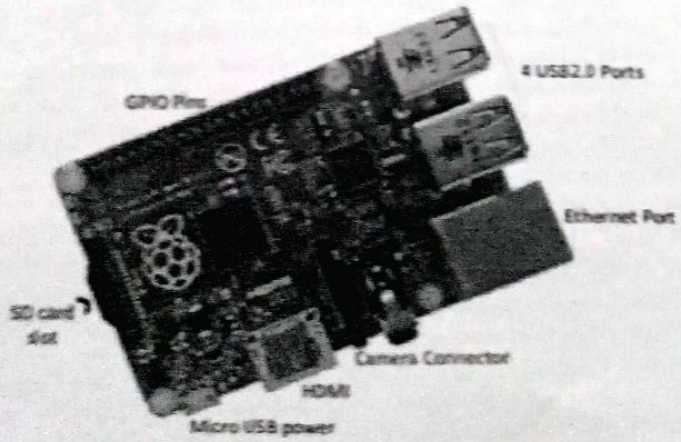

Fig 1 Raspberry PI board

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Energy Efficient ALU based on GDI Comparator

[1]Kiran Balu K, [2]Binu Manohar

[1]PG Scholar, [2]Assistant Professor
Dept. of ECE
Mangalam college of engineering
Ettumanoor, Kottayam, Kerala

Abstract— **This paper presents an energy efficient ALU using magnitude comparator designed in GDI(gate diffusion input) technique. The proposed GDI magnitude comparator used ALU has been compared with existing design technologies such as CMOS, Transmission gate logic (TG) and pass transistor logic (PTL). The performance analysis of comparator designed using this technologies is done on the basis of power consumption ,delay and number of transistors using Cadence virtuoso tool and found to be efficient. Based on the performance of GDI comparator in ALU, all blocks of ALU is designed using GDI technology. The simulation results of GDI ALU have shown remarkable performance in terms of power consumption, delay & number of transistors compared to ALU designed using CMOS, TG & PTL. But this GDI ALU suffers from some practical limitation like swing degradation. This limitation can be overcome by modified GDI ALU. Thus proposed GDI ALU can be a viable option for low power application.**

Keywords—ALU, VLSI, Gate Diffusion Input (GDI), CMOS, TG, PTL, Low power, Mod-GDI.

I. INTRODUCTION

Comparators are the basic building block of ALU which are extensively used circuit elements in Very Large Scale Integration (VLSI) systems such as Digital Signal Processing (DSP) processors, microprocessors etc. It is the nucleus of many other operations like sorting, data processing, and decoding instruction. In most of the digital systems, comparators lie in a critical path which influences the overall system performance. Hence, enhancing Comparator performance is becoming an important goal. The performance of comparator can be optimized by proper selection of logic styles. Different logic design styles such as CMOS, PTL, TG technologies can be used. But this techniques have its own drawback such as more number of transistors, more power consumption all. To overcome this problem a new logic style (GDI Technique) has been proposed. GDI technique, Simply uses basic GDI cell consisting of only two transistors and three inputs to implement various complex function. It is proved that GDI technique required lesser number of transistor and low power consumption. Employing fast and efficient GDI comparators in arithmetic logic unit(ALU) will aid in the design of low power high performance system as ALU is one of the main components of a microprocessor. As the number of transistor is reduced in the GDI technique ALU it is obvious that its area is optimized. Apart from this optimized area of ALU the other evident advantage we get is speed. Apparently as the number of transistor used is reduced the operating time is also reduced and operation are done in less time. So our new ALU is also fast in operation as compare to its counterpart

II. LITERATURE SURVEY

The traditional method to implement the comparator is by flattering the logic function directly, but this method is only suitable for the comparator with less number of inputs [1]. When large number of inputs are applied, circuit complexity increases drastically and the operating speed is degraded accordingly. Alternative way to implement the comparator is by using a parallel adder [2]. In this method, the adder has become the major factor for reducing the operating speed. A thousand numbers of transistors are used to increase the speed of adder [3]-[5]. Richard [6] proposed a new logic all-n-logic (ANL) to improve the operating speed. Wang [7] used this logic and implemented 64 bit high-speed comparator with two phase clock. It is designed by using six pipeline circuits and each comparison operation through these six pipelines. Even though heavily pipeline is useful to achieve high throughput but it may not be suitable for all applications, such as in the ARM microprocessor [8] which is often needs to execute a comparison instruction with a single clock cycle. Hunag proposed comparator using single clock cycle based on the priority-encoding algorithm [9]. It not only improves the operating speed but also makes circuit more power efficient. Parallel MSB checking algorithm [10] and MUX-based structure [11] was proposed to improve the performance of comparator at the expense of twice the number of transistor.

All of aforementioned works give high performance using dynamic logic. But dynamic logic is not suitable for low power operation as compared to static logic; dynamic activity factor is 0.5 and 0.1 for static logic which is advantageous.

The CMOS technology [12] have been resulted in many circuit design logic style during the last two decade [13] and [14] the various topologies such as conventional CMOS, nMOS pass transistor logic, transmission gates and pseudo nMOS logic style. By using all this logic style 2-Bit magnitude comparator has been implemented by Vandana[15] and Anjuli [16].

The work done in [15] and [16] has shown that the output voltage swing is better in CMOS logic design and transmission gate design, Whereas, Transmission gate logic require more number of transistor as compare to CMOS design. But Pseudo nMOS and PTL logic style requires less no transistor in comparison to CMOS logic style. There is output voltage swing degradation in PTL and Pseudo nMOS logic style.

To overcome this problem a new logic style (GDI Technique) has been proposed by A. Morgenshtein [17]. GDI technique is superior over other design techniques in terms of low power and high speed VLSI design. GDI technique simply uses a basic GDI cell consisting of only two transistors and

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Design of Modified Low Power and High Speed Carry Select Adder Using Brent Kung Adder

[1]Amala Maria Alex, [2]Nidhish Antony

[1]MTech in VLSI & Embedded Systems, [2]Assistant Professor ECE Dept
Mangalam college of Engineering, Kottayam, Kerala, India

***Abstract*—In order to perform the addition of two numbers adder is used. Adder also forms the integral part of ALU. Besides this application of adder in computer, it is also employed to calculate address and indices and also operation codes. Different algorithm in Digital Signal Processing such as FIR and IIR are also employed using adder. What all matter is speed and so it is the most important constraint. The important areas of VLSI areas are low power, high speed and data logic design. In Carry Select adder the possible value of input carry are 0 and 1. So in advance, the result can be calculated. Further we have the multiplexer stage, for calculating the result in its advanced stage. The conventional design is the use of dual Ripple Carry Adders (RCAs) and then there is a multiplexer stage. Here, one RCA (Cin=0) is replaced by Brent kung adder. As, RCA (for Cin=1) and Brent Kung adder (for Cin=0) consume more chip area, so an add-one scheme i.e., Binary to Excess-1 converter is introduced. Also the square root adder architectures of CSA are designed using Brent Kung adder in order to reduce the power and delay of adder. In proposed model a modification is done by using D-LATCH instead of Binary to Excess-1 to improve the speed and reduce power. Here the Binary to Excess-1 Converter is replaced with a D-Latch. Initially when en=1, the output of the BK adder is fed as input to the D-Latch and the output of the D-latch follows the input and given as an input to the multiplexer. When en=0, the last state of the D input is trapped and held in the latch and therefore the output from the BK adder is directly given as an input to the Mux without any delay.**

***Index Terms*— BK Adder-Brent Kung Adder,RCA-Ripple Carry Adder,CSLA-Carry Select Adder,RLBKCSLA-Regular Linear Brent Kung Carry Select Adder,MLBKCSLA-Modified Linear Brent Kung Carry Select Adder,RSQBKCSLA-Regular Square Root Brent Kung Carry Select Adder,MSQBKCSLA-Modified Square Root Brent Kung Carry Select Adder,PSQBKCSLA-Proposed Square Root Brent Kung Carry Select Adder**

I. INTRODUCTION

An adder is a digital circuit that performs addition of numbers. In many computers and other kinds of processors, adders are used not only in the arithmetic logic unit, but also in other parts of the processor, where they are used to calculate addresses, table indices, and similar operations. Addition usually impacts widely the overall performance of digital systems and an arithmetic function. Adders are used in multipliers, in DSP to execute various algorithms like FFT, FIR and IIR. Millions of instructions per second are performed in microprocessors using adders. So, speed of operation is the most important constraint. Design of low power, high speed data path logic systems are one of the most essential areas of research in VLSI. In CSA, all possible values of the input carry i.e. 0 and 1 are defined and the result is evaluated in advance. Once the real value of the carry is known the result can be easily selected with the help of a multiplexer stage. Conventional Carry Select Adder is designed using dual Ripple Carry Adders (RCAs) and then there is a multiplexer stage. Here, one RCA (Cin=1) is replaced by Brent kung adder[3].

As, RCA (for Cin=O) and Brent Kung adder (for Cin=1) consume more chip area, so an add-one scheme i. e. , Binary to Excess-1 converter is introduced. Also the square root adder architectures of CSA are designed using Brent kung adder in order to reduce the power and delay of adder. In this paper, Modified Square Root Carry select Adder using Brent Kung adder is proposed using single BK and BEC instead of dual RCAs in order to reduce the power consumption with small penalty in speed.

II. LITERATURE REVIEW

In Electronics, carry-select adder is a particular way to implement an adder. It is a logic element that computes the sum of two n-bit numbers. The carry-select adder generally composes of two ripple carry adders and a multiplexer.

Ripple Carry Adder

The Ripple Carry Adder is used to compute addition of two N-bit numbers. It consists of N full adders to add N-bit numbers. From the second full adder, carry input of every full adder is the carry output of its previous full adder. This kind of adder is typically known as Ripple Carry Adder because carry ripples to next full adder. The layout of Ripple Carry Adder is simple, which allows fast design time. The Ripple Carry Adder is slowest among all the adders because every full adder must wait till the previous full adder generates the carry bit for its input. The 3-bit RCA is shown in Fig 1. Theoretically the Ripple Carry Adder has delay of $o(n)$ and area of $o(n)$ [6].

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Full Length Article

Investigation on energy efficient sensor node placement in railway systems

Ayona Philipose, Rajesh A *

School of Electronics Engineering, VIT University, Vellore, Tamil Nadu, India

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ABSTRACT

Recently wireless sensor network (WSN) has been widely used for monitoring railway tracks and rail tunnels. The key requirement in the design of such WSN is to minimize the energy consumption so as to maximize the network lifetime. This paper includes the performance of an improved medium access control (MAC) protocol, namely, time adaptive-bit map assisted (TA-BMA) protocol, for the purpose of communication between the sensors placed in a railway wagon. The train is considered to be moving at a constant speed, and the sensor nodes are stationary with respect to the motion of train. The effect of mobility on the proposed MAC protocol is determined using genetic algorithm (GA), and the observed increase in energy consumption on considering mobility is 18.51%. Performance analysis of the system model is carried out using QualNet (ver. 7.1), and the energy consumption in transmit mode, receive mode, percentage of time in sleep mode, end-to-end delay and throughput are investigated.

1. Introduction

Wireless sensor network (WSN) consists of a large number of distributed sensor nodes which can be used to sense data from the physical environment [1,2]. These types of networks have many practical applications, and in this paper their applications in railway monitoring systems are discussed. WSNs are used to monitor railway tracks, rail tunnels, detect abandoned bodies in railway platforms, develop intrusion detection systems and secure railway operations. Due to the lack of safety and security monitoring, the railway runs the risk of train collision, derailment and possible terrorist threats [3]. Sensor network applications require long lifetime, data accuracy, and energy efficiency. Hence, power management is an important design constraint for WSNs. This is because sensor nodes are equipped with battery of short life, and they should use it efficiently in cases where the system operates for long durations [3,4].

Sensor nodes consume energy while sensing, processing and communicating sensed data. Each node can transmit only a fixed number of bits and in case a node has a heavy burden of communication, it gets depleted fast, thus affecting the entire network [5]. In WSN, major waste of energy happens due to collision, idle listening, overhearing, presence of overhead, etc. Various energy saving methods are proposed for medium access control (MAC) protocols in WSN to avoid wasting the limited energy [3,6]. Energy efficient MAC is necessary for the successful operation of shared medium networks. The MAC can be of contention based or schedule based protocol. Among these protocols, schedule based protocols are collision free and thus save energy wasted due to collision.

In Reference 6, scheduled-based Time-division multiple access protocol (TDMA) has been discussed, in which the transmission channel is divided into several time slots and each node is assigned a time slot. Each node wakes up and transmits data only in its allocated time slots and remains in sleep mode at other times. This protocol is energy efficient only when the traffic load is high. In Reference 3, an energy efficient adaptive TDMA (EA-TDMA) protocol has been proposed, where every node wakes up in its allocated time slot and checks transmit buffers. If there are no data to transmit, it turns off the radio immediately. This protocol reduces energy consumption by idle listening.

In Reference 1, a bit map assisted (BMA) protocol intended for event-driven applications have been proposed, where sensor nodes transmit data to cluster head only if significant events are observed. Here time slot is allocated in the contention phase before starting of each frame unlike in TDMA and EA-TDMA where a data slot allocated to a node persists for all frames in that round. In Reference 7, an energy efficient bit map assisted protocol (E-BMA) has been proposed, in which the source nodes use piggybacking to make reservation of the corresponding data slot. Unlike BMA, it does not make reservation in the contention slot as soon as the data packet is available, but it waits for one additional frame duration to see if there is a successive data packet to send. This protocol is energy efficient at low and medium traffic

* Corresponding author. Tel.: +91 9994220967, fax: +91 4132655368.
E-mail address: rajeshtechece@gmail.com (R. A).
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HEAD OF DEPARTMENT
Department of Computer Science & Engineering
Mangalam College of Engineering
Ettumanoor 686 631

Internal Quality Assurance Cell (IQAC)
Mangalam College of Engineering
Kottayam, India 686 631

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Unstructured Datasets Analysis: Thesaurus Model

Parvathy Gopakumar
Department of Computer Science and Engineering
Mangalam Engineering College
Kottayam,Kerala,India

Neethu Maria John
Department of Computer Science and Engineering
Mangalam Engineering College
Kottayam,Kerala,India

Vinodh P Vijayan
Department of Computer Science and Engineering
Mangalam Engineering College
Kottayam,Kerala,India

Abstract: Mankind has stored more than 295 billion gigabytes (or 295 Exabyte) of data since 1986, as per a report by the University of Southern California. Storing and monitoring this data in widely distributed environments for 24/7 is a huge task for global service organizations. These datasets require high processing power which can't be offered by traditional databases as they are stored in an unstructured format. Although one can use Map Reduce paradigm to solve this problem using java based Hadoop, it cannot provide us with maximum functionality. Drawbacks can be overcome using Hadoop-streaming techniques that allow users to define non-java executable for processing this datasets. This paper proposes a THESAURUS model which allows a faster and easier version of business analysis.

Keywords: Hadoop;MapReduce;HDFS;NoSQL;Hadoop-Streaming

1. INTRODUCTION

Data has never been more important to the business world as it has become a vital asset as valuable as oil and just as difficult to mine, model and manage. The volume and veracity of the datasets that are being stored and analyzed by the business are unforeseeable and the traditional technologies for data management such as relational databases cannot meet the current industry needs. Bigdata technologies play a vital role to address this issue. Early ideas of big data came in 1999 and at present it becomes an unavoidable phenomenon tool through which we manage business and governance. For a layman the idea of Bigdata may relate to images of chaotic giant warehouses over crowded office space with numerous staffs working through huge number of pages and come with boring formal documents under supervision of some old bureaucrat. On the contrary working of Bigdata is simple and well structured, yet exciting enough to pose new challenges and opportunities even to experts of industry. It provides parallel processing of data in hundreds of machines that are distributed geographically. Necessity of Bigdata arises under the obligation of the following:

1. When existing technology is inadequate to perform data analysis.
2. In the case of handling more than 10TB of dataset.
3. Relevant data for an analysis present across multiple data stores which are filed in multiple formats.
4. When steaming data have to be captured, stored and processed for the purpose of analysis.
5. When SQL is inefficient for high level querying.

In today's data centered world Hadoop is considered as the main agent of big data technology due to its open source nature. However as it is a java based ecosystem, it created hurdle for programmer from non-java background. To address this issue it has facilitated a tool, 'Hadoop-Streaming' by enabling flexibility in programming with effective parallel computability.

2. PROBLEM STATEMENT

Why Big data analysis? Well, it helps the organization to harness their transactional data and use it to identify new opportunities in a cost effective and efficient manner. Primary aim of data analysis is to glean actionable logic that helps the business to tackle the competitive environment. This will alert the business for their inevitable future by introducing new products and services in favor of the customers. Unfortunately for the matter of convenience 80% of the business oriented data are stored in an unstructured format. Structured data usually resides in a relational database with predefined structures so converting the data to different models and analyzing them seems mundane. Here the role of Hadoop-Streaming arises which works on a Map and Reduce paradigm by analyzing the unstructured data and presents viable business logic.

The aim of the paper is to:

- Study existing framework employed by industry players.
- Present a new roadmap for efficient and effective approach to Bigdata problems: THESAURUS MODEL

3. BACKGROUND

3.1 Structured Vs Unstructured datasets

The question that encounters a rookie is that why one uses unstructured dataset when there is always a possibility of using structured data. At the outset of computing, the term storage corresponded only plain texts. Now user needs to store richer content than plain text. Rich data type includes pictures, movies, music, x-rays ,etc.It provides superior user experience at the expense of storage space. Such data sets are called unstructured because they contain data that do not fit neatly in

a relational database. Industry came up with a third category called semi structured data which resides in a relational database, similar to structured data. However it does not have some organizational property necessary to make them easy to be analyzed.(Eg.XML doc)

3.2 NOSQL Data store

A NOSQL database [4] provides mechanism for storage and retrieval of data which is modeled in contrast to the tabular relations used in relational databases. It become common in the early twenty first century when the industrial requirements triggered a need of database structures that support query languages other than SQL.(called "Not only SQL", non SQL).This is mostly used in big data and real-time applications as it provides simpler design, horizontal scalability and high availability. The most popular NOSQL databases are MongoDB, Apache Cassandra [3], Datastax, Redis.

3.3 Hadoop & Hadoop Streaming

Apache Hadoop [1] is open source software for reliable, scalable and distributed computing. Hadoop framework allows distributed processing of large datasets across low level commodity hardware using simple programming models. This framework is inspired by Google's MapReduce structure in which application is broken down into numerous small parts and each part can be run in any node in the cluster. Hadoop contains two major components - a specific file system called Hadoop Distributed File System (HDFS) and a Map Reduce framework. Hadoop works on divide and conquer principle by implementing Mapper and Reducer in the framework. Mapper function splits the data into records and converts it into (key,value) pairs. Before feeding the output of the Mappers to Reducer an intermediate Sort and Shuffle phase is implemented in the MapReduce framework to reduce the work load at Reducer machine. The sorted (key,value)pair is given into Reducer phase. The Reducer function does the analysis of the given input and the result will be loaded to HDFS(eg.The maximum temperature recorded in a year, positive and negative ratings in a business etc.).The analyst has to develop Mapper and Reducer functions as per the demand of the business logic.

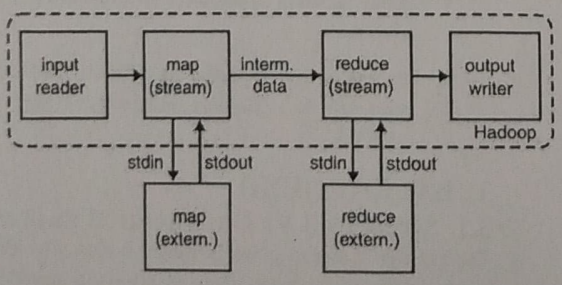

Figure 1 Hadoop-Streaming

Hadoop Streaming (see Figure 1) is an API provided by Hadoop which allows user to write MapReduce functions in languages other than java[2]. Hadoop Streaming uses Unix standard streams as the interface between Hadoop and our MapReduce programs, so the user has the freedom to use any languages (Eg. Python, Ruby, Perl etc.) that can read standard input and write to standard output.

4. ANALYSING UNSTRUCTURED DATASETS USNG HADOOP-STREAMING

Due to the difficulties in analyzing the unstructured data organizations have turned to a number of different software solutions to search and extract prerequisite information. Regardless of the platform used, the analysis must undertake three major steps– data collection, data reduction, data analysis [7][8][9][10](see Figure 2):

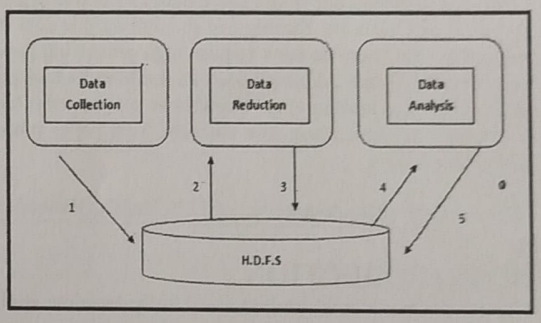

Figure 2 Analyzing Unstructured Dataset

A. Data Collection: In this stage the datasets to be analyzed can be collected through two methods. Firstly, data can be downloaded from different nodes containing the specified records to HDFS. Alternatively it can be done by connecting to the local servers containing the records. The former can be achieved by tools such as Sqoop, Flume and the latter using Apache Spark[6]. In a real time environment the streaming datasets can be accessed using standard public key encryption technique to ensure authenticity.

B. Data Reduction: Once the unstructured dataset got available, analysis process can be launched. It involves cleaning the data, extracting important features from data, removing duplicate items from the datasets, converting data formats, and many more. Huge datasets are minimized into structural and more usable format using series of Mapper and Reducer functions. This is done by projecting the columns of interest and thus converting it in a format which will be adaptable for final processing. Cleaning text is extremely easy using R language, whereas Pig and Hive supports high level abstraction of data preprocessing.

C. Data Analysis: Before the inception of Bigdata technologies collecting, preprocessing and analyzing terabytes of data was considered impossible. But due to the evolution of Hadoop and its supporting framework the data handling and data mining process seems not so tedious. Programmer with the help of Hadoop Streaming API can write the code in any language and work according to the domain of user. In this stage the pre processed data is studied to identify the hidden pattern. Hadoop provides a Mahout tool that implements scalable machine learning algorithms which can be used for

collaborative filtering, clustering and classification .The analyzed data then can be visualized according to the requirement of the business using Tableau, Silk, CartoDB, Datawrapper.

Thus the whole process of analysis can be explained in a five step workflow:

1. Collecting the data from alien environment and keep it inside the Hadoop Distributed File System.
2. Apply set of MapReduce tasks to the step one collected data and project the columns of interest based on the user query.
3. Keep the preprocessed data in HDFS for further analysis.
4. Use the preprocessed data for analyzing the pattern of interest.
5. Store the result in HDFS so that with the help of visualization tools user can selectively adopt the method of presentation.

5. MODIFICATION OF EXISTING SYSTEM: THESAURUS MODEL

The underline motivation behind this model is the lack of knowledge base in the existing analysis framework which in turn causes the system to follow some unnecessary repetition. Consider an analysis problem to find the maximum recorded temperature in last 5 years. So the analysis is done by

1. Collecting the data from National Climatic Data Center [5] and store in HDFS.
2. Project the field which contains the temperature data i.e. the column of interest.
3. Store the preprocessed result in HDFS.
4. Find the maximum temperature reported by analyzing the (key, value) pair.
5. Store the final result in HDFS.

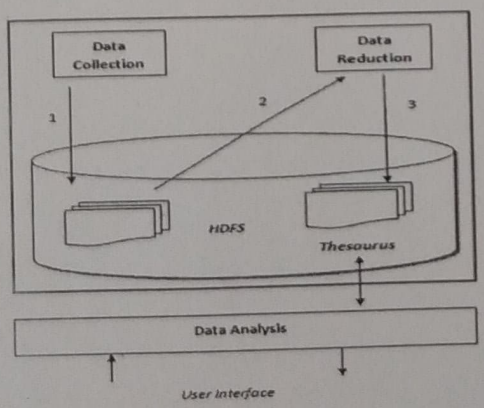

Figure 3 Thesaurus Model

So the maximum temperature of the year is accessed from the file system and can be used for monitoring and reporting purposes. Later if the same analyst needs to find the maximum humidity reported, he has to go through the whole datasets and has to bear the trouble of preprocessing and reducing the data again. This can be avoided by using Thesaurus model. According to this module, minable information are logically arranged and kept in the HDFS so that the future request for the information retrieval can be done in no time. Once the data set is converted into a structural format the schema of the dataset should be specified by the preprocessing programmer so the analyst need not come across the trouble of understanding the newly created data set.. This preprocessed datasets can replace the old datasets so that the unnecessary storage issue is taken care of by the model. The working of the system is specified in two phases, one for collection and preprocessing, and second for analysis. In the first phase the necessary data which can be analyzed are collected and preprocessed. This data is then stored in the thesaurus module in HDFS and made it available for the user to analyze based on the industry needs. Thesaurus not only contains the structured data but also the schema of the data storage. In phase two, the required query can be addressed by referring the schema .Thus analyst need not consider the problems of unstructured data collected by the system. The Figure 3 represents the work flow of Thesaurus model.

1. Collect the data from distributed environment and store in HDFS.
2. Use the stored data for preprocessing.
3. Store the preprocessed data in Thesaurus with a predefined schema. To avoid the storage bottleneck the data that are collected on the first place can be removed as it is no longer necessary.

6. CONCLUSION & FUTURE SCOPE

Mining the inner pattern of business invokes the related trends and interests of the customers. This can be achieved by analysing the streaming datasets generated by the customers in each point of time.Hadoop provides flexible architecture which enables industrialist and even starters to learn and analyse this social changes.Hadoop-Streaming is widely used for sentimental analysis using non-java executables.Also proposed a THESARUS model which works in a time and cost effective manner for analysing these humongous data. Future scope is to enable the efficiency of the system by developing a THESARUS model which is suitable to analyse terabytes of data and returns with the relative experimental results.

7. ACKNOWLEDGMENTS

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Article

Coverage and Lifetime Optimization of WSN using Evolutionary Algorithms and Collision Free Nearest Neighbour Assertion

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Authors:

Kumar Narayanan
Vels Institute of Science Technolgy and A...

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Abstract

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Coverage and Lifetime Optimization of WSN using Evolutionary Algorithms and Collision Free Nearest Neighbour Assertion

Vinodh P. Vijayan* and N. Kumar

Department of Computer Science and Engineering, Vels University, Chennai-600043, India

ABSTRACT

Multipath transmission of raw sensor signals is the customary technique used in the wireless sensor network to improve end-to-end delivery. However, this technique suffers significantly because of the occurrence of multiple copies of data at the destination and their collision. The Collision-Free Nearest Neighbour Assertion (CNNA) method with n-d tree structure improves the collision removal which, in turn, avoids duplicate packets, but load balancing among neighbouring nodes is an essential issue. Optimising network performance by considering various network parameters and load balancing the network demands a good evolutionary-based optimisation technique other than traditional algorithms. Optimisation techniques based on Particle Swarm Optimisation (PSO) and Genetic Algorithm (GA) are applied and compared against various network parameters in this work.

Keywords: Collision-Free Nearest Neighbour Assertion (CNNA), genetic algorithm (GA), multipath transmission, Particle Swarm Optimisation (PSO).

INTRODUCTION

Coverage, network-life time and end-to-end delivery are the three important parameters that decide the performance of a wireless sensor network (WSN). In WSN, network lifetime and coverage are dependent parameters, meaning there is a trade-off between these two parameters. Coverage can be simply improved by making more sensors active for a unit amount of time but this affects the life time of the sensor network. Similarly, in order to improve the average life time of the sensor network more sensors are needed to be in sleep mode for the maximum possible duration but this approach affects coverage of the network critically (Vijayan et al., 2015). The balancing of sensor coverage and network lifetime is a fundamental issue because of the dynamic nature of mission requirement. End-to-end delivery is also an important parameter because it ensures all fruitful messages reach the base station; this

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E-mail addresses:
vinodh.pvijayan@mangalam.in (Vinodh P. Vijayan),
kumar.se@velsuniv.ac.in (N. Kumar)
*Corresponding Author

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demands multiple sensors to be active and a multipath transmission that ultimately affects network life time. So it is important to use good optimisation techniques to decide the optimal sensor scheduling that yields superior load balancing. The demand of the scheduling algorithm is purely on improving the pre-defined coverage and lifetime requirement. The dynamic nature of the application demands different coverage requirement but at the same time, lifetime parameters are always expected to be maximum. The proposed scheduling algorithm optimises coverage and life time based on the requirement by considering other network parameters like end-to-end delivery, throughput and load balancing etc. The type of sensor like static sensor or dynamic sensor requires different levels of attention in sensor scheduling because the requirement of coverage enhancement with a fixed number of static sensors cannot be solved using traditional techniques. Similarly, there are multiple mission requirements where the traditional algorithm fails, so an optimisation algorithm is needed that considers these multi-objective parameters for the best possible solution. Measurement coverage and life time are considered based on a spatial-temporal metric where the product of area and duration is calculated. In this work, we applied the collision-free Nearest Neighbour Assertion method in the inter-domain to improve the elimination of duplicate packets and energy, end-to-end delay, data loss etc. in WSN. The global measure of spatial-temporal coverage is taken from the average value of the individual local sites and such use of a network-wide metric guarantees global optimum solutions.

As the initial formulation of the problem confirms it is an NP hard optimisation problem, our objective was to optimise spatial temporal coverage by scheduling robotic sensors that use a centralised heuristic optimisation approach with the Nearest Neighbour Assertion method. As this is a classic problem of optimisation, coverage and lifetime measurement can be improved with the application of Genetic Algorithm (GA) (Vijayan et al., 2014) or Particle Swarm Optimisation (PSO). A comparison of the GA and PSO in this application context shows that each technique had its own strength according to context and configuration. However, challenges like creating initial populations, chromosome representation, selection of genetic operators etc. need to be solved in the implementation phase.

LITERATURE REVIEW

Robotic sensor coverage and lifetime optimising problems in a WSN has been discussed in detail. Convergent diversity like area coverage, point coverage and barrier coverage has been analysed precisely (Cardei & Wu, 2005). In coverage optimisation, most of the research focussed on minimising the number of wireless sensors without affecting coverage degree (e.g. 1-degree or k-degree) (Tian & Georganas, 2002; Wang et al., 2003) but these works did not consider network lifetime. A centralised scheduling algorithm can be used to activate sensors sequentially to ensure coverage and guarantee the O (logn) (Liu & Cao, 2010) factor of the improved network lifetime, where n is the total number of nodes. Further, application of a distributed scheduling algorithm improved the performance factor by O (logn*lognB), where B is the upper bound (Meguerdichian et al., 2001) of the initial battery. Connectivity is the other factor that needs research attention in WSN. For example, when coverage requirement could be satisfied, the conditions to achieve communication connectivity were derived (Kumar

et al., 2005). If coverage is not up to the expected level it needs to be improved e.g. partial coverage can be slightly improved by proper application of routing protocols (Kasbekar et al., 2011) that ensure delivery of data at the destination.

Major research works treat lifetime as an important objective and coverage and end-to-end delivery etc. as constraints that need the scheduling of robotic sensors for a unit amount of time to optimise total spatial-temporal coverage redundancy. Differences in problem formulation approaches are applicable based on the mission requirement for coverage or network life time.

THE OPTIMISATION OF NETWORK PARAMETERS AND LOAD-BALANCING PROCEDURE

In order to yield the optimum result, the robotic sensors need to cover a maximum area without compromising on life time of the network and other parameters like end-to-end delivery etc. In the implementation of the total network time 'T' is divided into 'L' number of cycles and the various sensors within each cycle are turned on based on the present coverage and battery life. The same procedure is repeated in each cycle and the sleep mode of the sensor is used in the same way the power-saving mode of 802.11 is used. The purpose of optimum scheduling is to identify the 'L' local schedule, which ensures maximum overall spatial-temporal coverage.

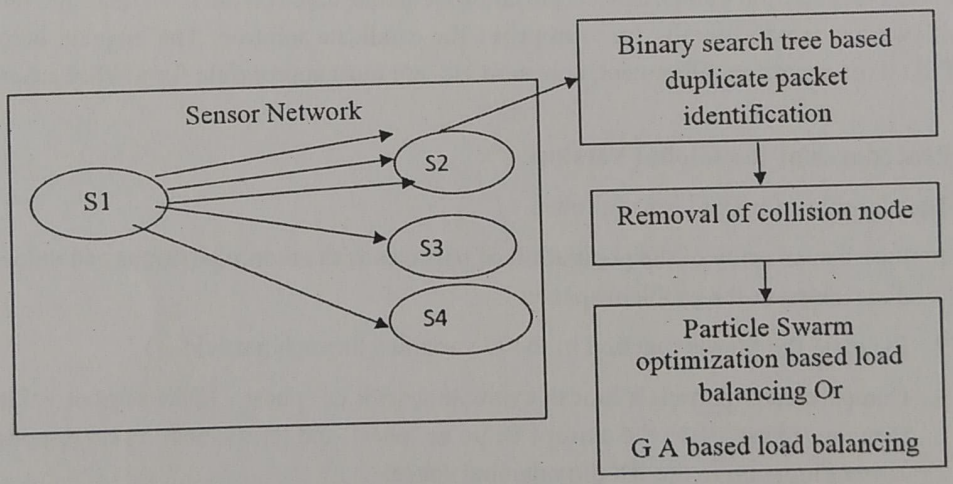

Figure 1. System architecture.

Here the initial step (Kumar et al., 2004) was to locate 'k' nearest neighbour sensor based on the distance or round-trip time in the wireless robotic sensor networks. Once the nearest neighbour list was identified a query would be sent to the nearest nodes and perimeter nodes around the query. A circle was formed around the query point and this space was further divided into subspaces of similar nature, with each subspace containing a perimeter node. Information from each subspace was collected through the perimeter node through a tree structure. Once the query was resolved the tree might be removed from the memory due to cost of maintenance.

The neighbour list created is used for Collision-Free Nearest Neighbour Assertion (CNNA) (Vijayan et al., 2016) and an n-d tree is created as shown in Figure 1. The focus is on locating

the nearest robotic sensor nodes; we assume the locations of robotic sensor nodes usually do not change during this time. Many researchers concentrate on the static environment (Zou & Chakrabarty, 2005; Kumar et al., 2004), but here the focus was on the dynamic environment tracked by the robotic sensor network. The object near a query point was located and the number of indexing schemes were proposed as dynamic object databases (Bai et al., 2006; Cardei et al., 2005).

Figure 1 clearly describes the segregation procedure with the aid of a flow chart. The nearest neighbour assertion method creates a neighbour list using the binary search technique and duplicate packets are removed based on the variance (Vijayan et al., 2016) value computed on each node, which is higher than a pre-defined threshold value (Liu et al., 2005). The evolutionary algorithms are now applied to the network to optimise network performance and parameters with the focus of load balancing.

The genetic optimisation procedure on the n-d data structure in the CNNA method undergoes genetic operations like initial population, selection, cross-over and mutation operation. Genetic operations with a weighted variance are used to optimise the load factor in a robotic sensor network with other network parameters. Challenges identified during the implementation are representation of chromosomes and selection of different genetic operators.

The GA-based optimisation technique is replaced by PSO and the performance measure is done. PSO is a robust stochastic optimisation technique based on the movement and intelligence of swarms, which literally try to improve the candidate solution. The inherent behaviour of PSO like separation, alignment, cohesion etc. are most appropriate for a WSN environment.

Procedures of the Global Version

The algorithm for PSO is as follows:

1. Initialise an array of the population of particles with random positions and velocities in D dimensions in the problem space.
2. Evaluate the fitness function in the D variables for each particle.
3. Compare each particle's fitness evaluation with its 'pbest'. If the current value is better than the 'pbest', save the current value as 'pbest' and let its location correspond with the current location in the 'D' dimensional space.
4. Compare the fitness evaluation with the population's overall previous best. If the current value is better than the 'gbest', save the current value as the 'gbest' to the current particle's array index and value.
5. Modify the velocity and position of the particle according to the following equations:

$$V_{id} = V_{id} + C_1 r_1 (P_{id} - X_{id}) + C_2 r_2 (P_{gd} - X_{id}) \quad [1]$$

$$X_{id} = X_{id} + V_{id} \quad [2]$$

The difference is that the basic principles applied to GA and PSO yield slightly different performance especially in different contexts.

METHOD AND RESULTS

The robotic sensor network is a distributed ad-hoc network comprising a large number of robotic sensor nodes equipped with capabilities of computing, storing and communicating. In this research simulation was done on Network Simulator 2 to evaluate the performance of the proposed collision-free Nearest Neighbour method with GA and PSO in the inter-domain. In the simulation, n robotic sensors were deployed in an area of 20 X 20 square metres with random motion enabled; the value of n varied from 100 to 800. The sensing range was 1 unit unless, otherwise specified. The scenarios were identified such that the application requirement made it difficult to achieve coverage and lifetime. Both homogeneous and heterogeneous cases of battery states were considered. In the homogeneous scenario, every node had the same battery/ network lifetime ratio, but in the heterogeneous scenario the battery life factor of each sensor node was considered different with value.

Result Analysis of CCNA with Optimisation Technique Applied

In order to analyse and infer the characteristics and functionality of the CNNA method with GA or PSO, we quantitatively simulated performance by considering a network size of 1000 * 1000 with simulation time varying from 100 to 800 (m/s). The routing protocol used was Dynamic Source Routing (DSR) Protocol and we compared the outcomes of the results achieved with the Genetic Optimisation (GO) algorithm and Particle Swarm Optimisation (PSO). The simulation results using NS2 simulator were compared and analysed using tabulated values and graphical form as given below. Table 1 shows the measured values that are evident for effectiveness of Genetic Optimisation algorithm and Particle Swarm Optimisation to support transient performance. The results were measured to obtain the collision-removal rate and comparison was made between the two techniques.

Table 1
Measure of Collision-Removal Rate & Measure of Load-Balancing Efficiency

Node Density	Collision Removal Rate (bps)		Load Balancing Efficiency in Terms of Load Balancing Factor (%)	
	CNNA with GA	CNNA with PSO	CNNA with GA	CNNA with PSO
100	2.105	2.055	48.15	43.10
200	3.472	3.172	51.25	46.20
300	3.750	3.650	57.35	52.30
400	4.025	4.045	61.15	56.10
500	5.275	5.125	64.24	41.59
600	4.135	4.225	53.45	62.60
700	9.105	9.035	70.05	65.00
800	11.255	11.150	71.08	66.03

Figure 2 shows that the Collision-Free Nearest Neighbour Assertion (CNNA) method provided a higher collision removal rate but it was comparable to both GA and PSO. The improved result was due to the application of collision-free nearest neighbour assertion

methods that efficiently identified duplicate packets created for a time period using n-d data structure with binary tree search. The n-d data structure identified the collision node using the binary tree, which ultimately reduced duplicate packets in the network and the node overhead in processing duplicate packets.

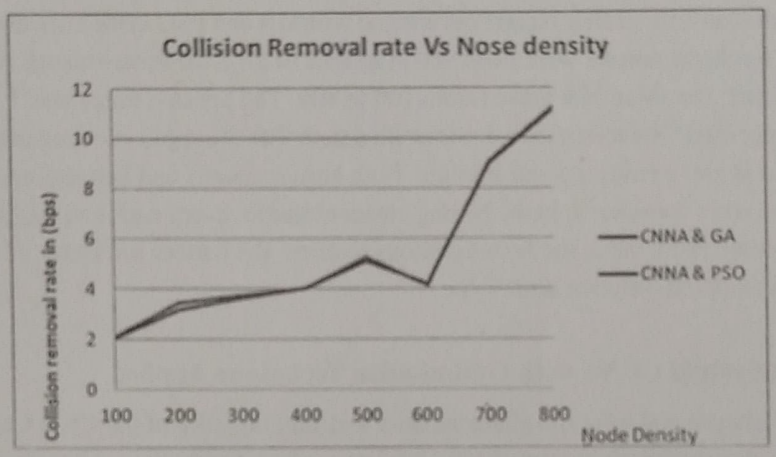

Figure 2. Impact of collision-removal rate on CNNA.

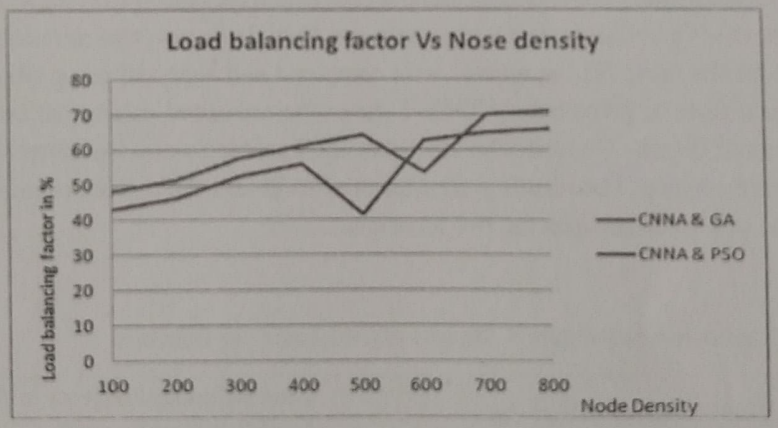

Figure 3. Impact of load-balancing efficiency with GA and PSO.

Figure 3 shows the load-balancing efficiency of both optimisation techniques. This result also proves that the effectiveness of both algorithms was comparable and that they performed equally well.

The comparison of the packet delivery ratio against the varying number of nodes for both GA and PSO was measured and tabulated as shown in Table 2. Figure 4 plots the packet delivery ratio of the two different optimisation techniques applied. It can be inferred from the graph that both GA and PSO provide a good packet delivery ratio with CNNA.

Table 2
Measure of Packet Delivery Ratio & Measure of Throughput.

Packet Delivery Ratio (%)			Throughput in %		
Node density	CNNA with GA	CNNA with PSO	Time	CNNA with GA	CNNA with PSO
100	30.25	36.35	100	66.3	32.35
200	32.45	42.44	200	59.1	37.48
300	38.56	48.52	300	58.2	42.55
400	42.35	52.35	400	52.0	58.42
500	45.55	55.45	500	66.33	62.59
600	55.45	60.45	600	70.53	70.25
700	34.45	45.25	700	65.23	70.38
800	72.35	72.45	800	66.70	70.45

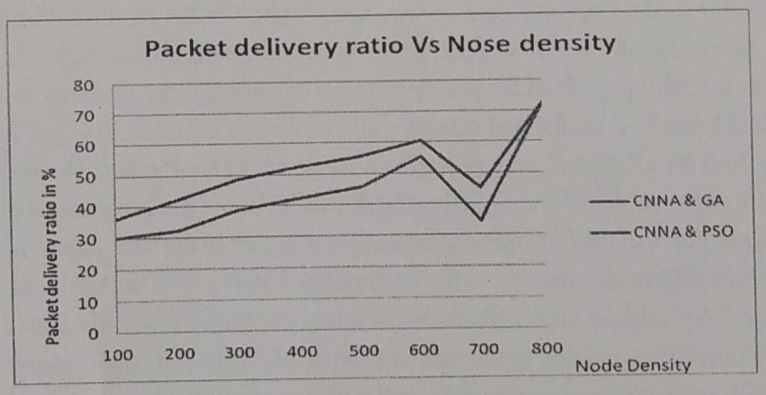

Figure 4. Impact of packet delivery ratio on varied node density.

The second part of Table 2 shows the measured value of the throughput against time and the corresponding graph plotted in Figure 5. It is evident from Figure 5 that the GA with CNNA is a good technique in the early stages of simulation while the PSO with CNNA performs well in the later stages of simulation.

From the various results obtained it can be inferred that the difference in performance between GA and PSO in different contexts is due to the operational principle difference of these techniques. Due to the strength of genetic operators like cross-over and mutation GA could bring an effective solution in the early period of network time. However, PSO operates with a previous value and memory and it can perform well once the solution is closer or in the later stage of the network.

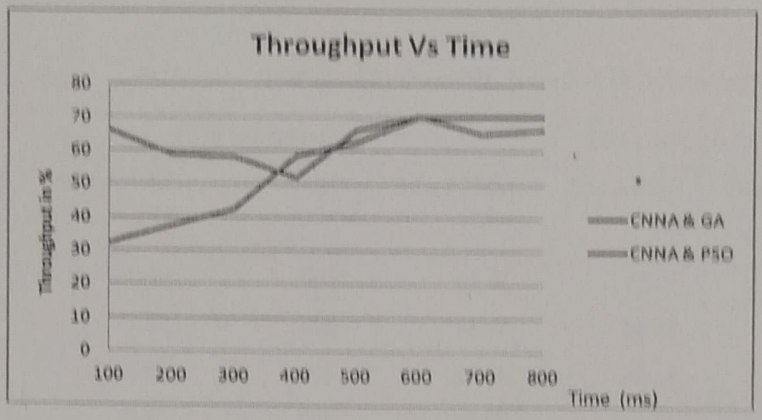

Figure 5. Impact of throughput on varying network time.

CONCLUSION

The application of Genetic Algorithm and Particle Swarm Optimisation in a wireless sensor network with Collision-Free Nearest Neighbour Assertion (CNNA) method is an effective technique for finding optimal sensor scheduling. The CNNA method eliminates duplicate packets in a network, which is generated due to multipath transmission. In this work, the optimisation technique solved the problem of load balancing in the network. The results proved that both GA and PSO performed equally well in collision removal, load balancing and packet delivery ratio for a dynamic network with a varying number of nodes. The results also proved that the throughput of the GA applied network was higher in the early stages of the scheduling and the throughput of the PSO applied network was higher in the later stages of scheduling. The performance difference was due to the operational difference of the optimisation techniques, where the GA produced higher fitness value initial populations quickly due to cross-over and mutation operations and due to the inherent nature of PSO i.e. it could operate on the existing values with large memory, performing well with later populations.

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An Efficient Steganography Using Mosaic Image with Enhanced Security

Anisha S[1], Neethu Maria John[2]

[1]PG Scholar, Dept of CSE, Mangalam College of Engineering, Mahatma Gandhi University, Ettumanoor, Kottayam, Kerala, India

[2]Assistant Professor, Dept of CSE, Mangalam College of Engineering, Mahatma Gandhi University, Ettumanoor, Kottayam, Kerala, India

Abstract: ***This paper presents an image hiding method using secret fragment visible mosaic image. In this method the confidential image is converted into secret fragment mosaic image of same or varied sizes. Mosaic image is created by composing small fragments of the secret image in to target image, resulting an effect of embedding the confidential image secretly in the resulting mosaic image. Color characteristics of the tile images are changed to make it similar as the target image. Further improvement on security is conducted by shuffling the mosaic image again and dividing the tile images in different sizes. Secret image is recovered from the mosaic image without any distortions.***

Keywords: mosaic image, encryption, shuffling.

1. Introduction

Steganography is the science of hiding of some data into another data. There are different types of steganography like text, image and video steganographies. Image steganography is hiding a secret image into another cover image.

The construction of mosaic images and the use of such images on several computer vision or graphics applications have been active areas of research in many years. Mosaic is a kind of artwork created by composing small pieces of materials, such as stone, glass, tile, etc. There are different types of mosaic images like crystallization mosaic, ancient mosaic, photo-mosaic, and puzzle image mosaic. The first two types are from decaying a source image into tiles and reconstructing the image by correctly painting the tiles, and so they both may be called *tile mosaics*. The other two types of mosaics are by placing images from a database to cover an assigned source image, and both may be called *multi-picture mosaics*.

In this paper, a new methodology for secure image transmission is proposed, which is to change a confidential image into a Mosaic image seeming to be like the preselected target image. The mosaic image is the result of organizing the piece parts of a confidential image in a manner in order to camouflage the other image called the cover image. The transformation process is followed by another shuffling and encryption which will enhance the security of the method. Appropriate schemes are also proposed to conduct *nearly-lossless* revival of the original secret image.

(a) (b) (c)

Figure1: Result of the proposed method (a)secret image (b)cover image(c)secret fragment mosaic image from (a) and (b) by the method

2. Related Works

2.1 A New Secure Image Transmission Technique via Secret-Fragment-Visible Mosaic Images by Nearly Reversible Color Transformations

In this paper, Ya-Lin Lee propose a technique for the transmitting of the secret image securely and lossless. This method transforms the secret image into a mosaic tile image having the same size like that of the target image which is preselected from a database. This color transformation is controlled and the secret image is recovered lossless from the mosaic tile image with the help of the extracted relevant information generated for the recovery of the image [1].

2.2 Secret Fragment Visible Mosaic Image Using Genetic Algorithm

This paper presents an image hiding method using fragment visible mosaic image. In this method the secret image is divided into blocks or tiles and they are shuffled or reordered to become a target image in the mosaic form. In the existing method an image similarity measure, h-feature is defined using the color distribution in the pixels. The h-feature is used to select the most appropriate cover image for the secret image from an image database and also for the tile shuffling process. Since the tile re-ordering is done in a single iteration the performance is limited. So a genetic algorithm is used here in the tile shuffling by choosing PSNR as the match criterion to improve the quality of encrypted image.[2]

2.3Hiding data in images by simple LSB substitution

In this paper, a data hiding scheme by simple LSB substitution is proposed. By applying an optimal pixel adjustment process to the stego-image obtained by the simple LSB substitution method, the image quality of the stego-image can be greatly improved with low extra computational complexity. The worst case mean-square-error between the stego-image and the cover-image is derived. Experimental results show that the stego-image is visually indistinguishable

from the original cover-image. The obtained results also show a significant improvement with respect to a previous work.[3]

3. Proposed Scheme

In this paper, a new technique for secure image transmission is proposed, which transforms a confidential image into a significant mosaic image with the same size and looking like a preselected cover image. The alteration process is followed by a shuffling method which is controlled by a secret key, and only with the key can a person recuperate the secret image nearly lossless from the mosaic image. The mosaic image is the result of reorganization of the fragments of a secret image in cover up of another image called the cover image which is selected freely from any where.

As an illustration, Fig. 1 shows a result yielded by the proposed method. Explicitly, after a target image is selected randomly, the given secret image is first divided into fragments called tile images, which then are fit into comparable blocks in the target image, called target blocks, according to a resemblance measure based on color variations. Next, the color characteristic of each tile image is altered to be that of the related target block in the target image, resulting in a mosaic image which looks like the target image. The mosaic image is encrypted using a key followed by shuffling of the image which enhances the security. Appropriate schemes are also proposed to carry out nearly lossless recovery of the original secret image from the resulting mosaic image. The proposed method can alter a secret image into a disguising mosaic image without compression, while a data hiding method must hide a highly compressed version of the secret image into a cover image when the secret image and the cover image have the same data volume.

3.1 Phases of the Scheme

The main phases of the system are shown in the flow diagram

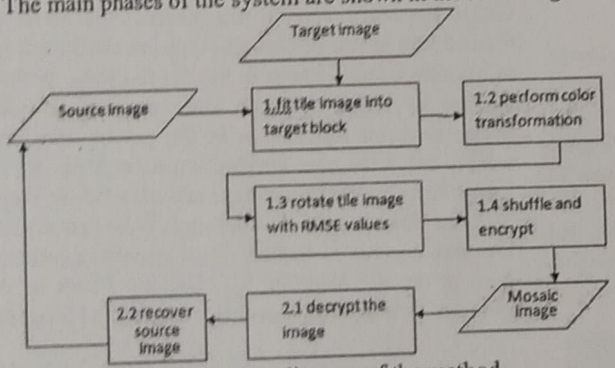

Figure 2: Flow diagram of the method

3.1.1 Mosaic image generation

This phase includes the following stages:

a) A cover image is selected freely.
b) Placing the tile images of the secret image into the target blocks of the selected cover image
c) Alter the properties of the cover image to make it similar to the secret image
d) A new image is created to store the mosaic image
e) After the mosaic image is created it is encrypted and shuffled again
f) Embedding relevant information into the created mosaic image for future recovery of the secret image

3.1.2 Secret image recovery

This phase includes the following stages

a) decrypt the mosaic image
b) retrieving the embedded information from the mosaic image
c) reconstructing the secret image from the mosaic image using the retrieved information.

a. Image Parts Creation

After the selection of the cover image, the very first step is to divide the secret image and the cover image into different parts. The size of the parts can be fixed or varied .The varied sized parts make the retrieval of the secret image more difficult for an attacker. The cover image should be larger than the secret image so that one pixel of the secret image is mapped in to one byte of the cover image. So in order to keep the three bytes of the secret image we need more pixels of the cover image. In addition to this extra information should be kept on the cover image like the order, position of the parts etc. So the cover image size should be larger than data image.

b. Finding pixel to pixel relation of the parts

The pixel to pixel relation between the parts is found to get the most similar parts of the secret image and the cover image. It is calculated using the R.M.S.E values of the parts of the images. The average values of the red, green and blue component of each part in the secret image and the cover image is calculated. Their differences give the R.M.S.E values of the corresponding parts. Using these methods the RMSE values of all the parts of the images are calculated and all these values are compared with each other to find out the minimum value. These minimum valued part of the cover image is selected to place the corresponding part of the secret image

c. Mosaic image generation

After finding out the most similar parts of both images, each of the pixels are combined together. Each pixels of the source and destination are stored in array. A new pixel is created to store the combined image. Each of these pixels are combined and stored in the new pixel. Additional information like height, width, position of the source image is also stored for further recovery.

After obtaining the mosaic image the image is encrypted and shuffled. A key is given for the encryption. Sequence generating functions are used for generating a random sequence for the shuffling of the image. The key is given as the seed of the function. Corresponding integer sequence is generated for each of the keys. So for the decryption part the same key should give as the seed so that the image should be recovered.

d. Secret image extraction

This is the last step of the project. The output of the extracted image is the same as the input. Before extracting the image

first decrypt using the correct key. A wrong key will generate errors. After that do the creation process in reverse process. De-embedded the recovery information stored in the newly created image..There are two steps in the process. The regain process is based on width and height of tile image in mosaic making process.

In the new file the position are not in the same order . Repetitively select randomly an unselected block other than the first block from using the random number generator with the key as the seed, extract bits from all the pixels of using a reverse edition of the lossless LSB substitute scheme proposed in and concatenate them successively, until all the bits of are extracted. Transform every bits into an numeral which specify the index of a tile image in the original secret image, resulting in the secret recovery series. After getting the tile images from position file then there is no replication of images because the image is repeated then the name would be same and overwrite the previous image.

4. Experimental Results

A sequence of experiments have been conducted to test the projected method using many secret and target images with various sizes. To show that the created mosaic image looks like the preselected target image, the quality metric of root mean square error (RMSE) is utilized, which is defined as the square root of the mean square difference between the pixel values of the two images.

The quality of the project is measured in terms of the difficulty to recover the original image for an attacker. This difficulty increases as the degree of randomness is more. It is the measure of which the two parts of the source and cover image are how randomly placed. The degree of randomness can be saved each time when the project is run. There are four conditions to be considered. The number of divisions of the parts may be fixed or varied. The parts of the mosaic image may be shuffled or not. A set of experiments have been conducted with all these conditions and the results are saved. These results are used to plot a graph with number of parts in the x-axis and degree of randomness in the y-axis.

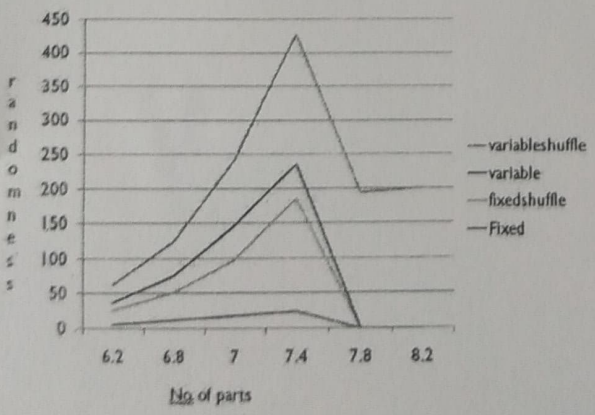

Figure 2: no. of parts against randomness

From the graph we can see that the level of randomness is the minimum in the fixed division of the parts without shuffling and the level is higher in the variable part division with shuffling, which is our proposed system .

5. Conclusion

Secret portion observable Mosaic Image can be used in image communication and also for secure keeping of secret images. The secret image is divided into blocks or tiles and these tiles are rearranged to form the mosaic image which visually looks like the cover image. The created image is encrypted and shuffled again with a secret key. Only with proper key the image can be extracted. Good experimental results have shown the achievability of the projected method

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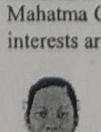
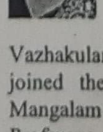
Author Profile



Anisha S pursuing M.Tech in Computer Science and Engineering from Mangalam College of Engineering, Mahatma Gandhi University. She received B.Tech degree in 2009 from Ilahiya College of Engineering, Mahatma Gandhi University, Kottayam, Kerala, India. Her research interests are Relational databases,security, etc.



Neethu Maria John, received the M.Tech degree in Computer science & Engineering from Anna University, Chennai, in 2007. In 2007, she joined the Department of Computer Science & Engineering, Viswajyothi college of Engineering & Technology, Vazhakulam where she was an Assistant Professor. In 2010, she joined the Department of Computer Science & Engineering, Mangalam College of Engineering, Ettumanoor, as an Associate Professor. Her current research interests include Computer Architecture and Data Management and Theory of Computation. She is a Life Member of the Indian Society for Technical Education (ISTE).

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Unstructured Datasets Analysis: Thesaurus Model

Parvathy Gopakumar
Department of Computer Science and Engineering
Mangalam Engineering College
Kottayam,Kerala,India

Neethu Maria John
Department of Computer Science and Engineering
Mangalam Engineering College
Kottayam,Kerala,India

Vinodh P Vijayan
Department of Computer Science and Engineering
Mangalam Engineering College
Kottayam,Kerala,India

Abstract: Mankind has stored more than 295 billion gigabytes (or 295 Exabyte) of data since 1986, as per a report by the University of Southern California. Storing and monitoring this data in widely distributed environments for 24/7 is a huge task for global service organizations. These datasets require high processing power which can't be offered by traditional databases as they are stored in an unstructured format. Although one can use Map Reduce paradigm to solve this problem using java based Hadoop, it cannot provide us with maximum functionality. Drawbacks can be overcome using Hadoop-streaming techniques that allow users to define non-java executable for processing this datasets. This paper proposes a THESAURUS model which allows a faster and easier version of business analysis.

Keywords: Hadoop;MapReduce;HDFS;NoSQL;Hadoop-Streaming

1. INTRODUCTION

Data has never been more important to the business world as it has become a vital asset as valuable as oil and just as difficult to mine, model and manage. The volume and veracity of the datasets that are being stored and analyzed by the business are unforeseeable and the traditional technologies for data management such as relational databases cannot meet the current industry needs. Bigdata technologies play a vital role to address this issue. Early ideas of big data came in 1999 and at present it becomes an unavoidable phenomenon tool through which we manage business and governance. For a layman the idea of Bigdata may relate to images of chaotic giant warehouses over crowded office space with numerous staffs working through huge number of pages and come with boring formal documents under supervision of some old bureaucrat. On the contrary working of Bigdata is simple and well structured, yet exciting enough to pose new challenges and opportunities even to experts of industry. It provides parallel processing of data in hundreds of machines that are distributed geographically. Necessity of Bigdata arises under the obligation of the following:

1. When existing technology is inadequate to perform data analysis.
2. In the case of handling more than 10TB of dataset.
3. Relevant data for an analysis present across multiple data stores which are filed in multiple formats.
4. When steaming data have to be captured, stored and processed for the purpose of analysis.
5. When SQL is inefficient for high level querying.

In today's data centered world Hadoop is considered as the main agent of big data technology due to its open source nature. However as it is a java based ecosystem, it created hurdle for programmer from non-java background. To address this issue it has facilitated a tool, 'Hadoop-Streaming' by enabling flexibility in programming with effective parallel computability.

2. PROBLEM STATEMENT

Why Big data analysis? Well, it helps the organization to harness their transactional data and use it to identify new opportunities in a cost effective and efficient manner. Primary aim of data analysis is to glean actionable logic that helps the business to tackle the competitive environment. This will alert the business for their inevitable future by introducing new products and services in favor of the customers. Unfortunately for the matter of convenience 80% of the business oriented data are stored in an unstructured format. Structured data usually resides in a relational database with predefined structures so converting the data to different models and analyzing them seems mundane. Here the role of Hadoop-Streaming arises which works on a Map and Reduce paradigm by analyzing the unstructured data and presents viable business logic.

The aim of the paper is to:

- Study existing framework employed by industry players.
- Present a new roadmap for efficient and effective approach to Bigdata problems: THESAURUS MODEL

3. BACKGROUND

3.1 Structured Vs Unstructured datasets

The question that encounters a rookie is that why one uses unstructured dataset when there is always a possibility of using structured data. At the outset of computing, the term storage corresponded only plain texts. Now user needs to store richer content than plain text. Rich data type includes pictures, movies, music, x-rays ,etc.It provides superior user experience at the expense of storage space. Such data sets are called unstructured because they contain data that do not fit neatly in

a relational database. Industry came up with a third category called semi structured data which resides in a relational database, similar to structured data. However it does not have some organizational property necessary to make them easy to be analyzed.(Eg.XML doc)

3.2 NOSQL Data store

A NOSQL database [4] provides mechanism for storage and retrieval of data which is modeled in contrast to the tabular relations used in relational databases. It become common in the early twenty first century when the industrial requirements triggered a need of database structures that support query languages other than SQL.(called "Not only SQL", non SQL).This is mostly used in big data and real-time applications as it provides simpler design, horizontal scalability and high availability. The most popular NOSQL databases are MongoDB, Apache Cassandra [3], Datastax, Redis.

3.3 Hadoop & Hadoop Streaming

Apache Hadoop [1] is open source software for reliable, scalable and distributed computing. Hadoop framework allows distributed processing of large datasets across low level commodity hardware using simple programming models. This framework is inspired by Google's MapReduce structure in which application is broken down into numerous small parts and each part can be run in any node in the cluster. Hadoop contains two major components - a specific file system called Hadoop Distributed File System (HDFS) and a Map Reduce framework. Hadoop works on divide and conquer principle by implementing Mapper and Reducer in the framework. Mapper function splits the data into records and converts it into (key,value) pairs. Before feeding the output of the Mappers to Reducer an intermediate Sort and Shuffle phase is implemented in the MapReduce framework to reduce the work load at Reducer machine. The sorted (key,value)pair is given into Reducer phase. The Reducer function does the analysis of the given input and the result will be loaded to HDFS(eg.The maximum temperature recorded in a year, positive and negative ratings in a business etc.).The analyst has to develop Mapper and Reducer functions as per the demand of the business logic.

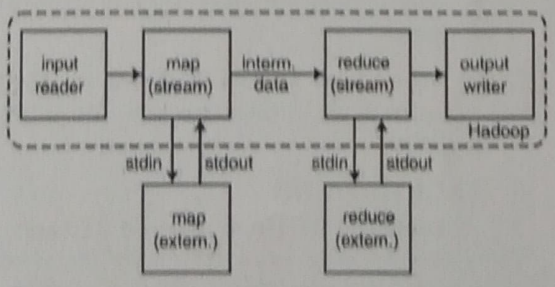

Figure 1 Hadoop-Streaming

Hadoop Streaming (see Figure 1) is an API provided by Hadoop which allows user to write MapReduce functions in languages other than java[2]. Hadoop Streaming uses Unix standard streams as the interface between Hadoop and our MapReduce programs, so the user has the freedom to use any languages (Eg. Python, Ruby, Perl etc.) that can read standard input and write to standard output.

4. ANALYSING UNSTRUCTURED DATASETS USNG HADOOP-STREAMING

Due to the difficulties in analyzing the unstructured data organizations have turned to a number of different software solutions to search and extract prerequisite information. Regardless of the platform used, the analysis must undertake three major steps– data collection, data reduction, data analysis [7][8][9][10](see Figure 2):

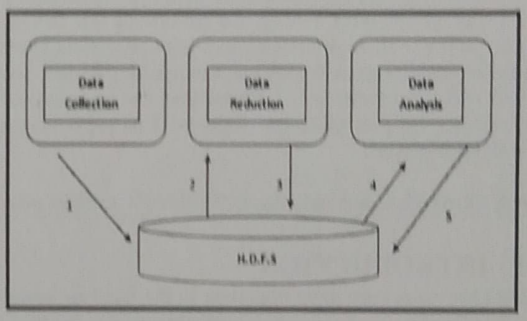

Figure 2 Analyzing Unstructured Dataset

A. Data Collection: In this stage the datasets to be analyzed can be collected through two methods. Firstly, data can be downloaded from different nodes containing the specified records to HDFS. Alternatively it can be done by connecting to the local servers containing the records. The former can be achieved by tools such as Sqoop, Flume and the latter using Apache Spark[6]. In a real time environment the streaming datasets can be accessed using standard public key encryption technique to ensure authenticity.

B. Data Reduction: Once the unstructured dataset got available, analysis process can be launched. It involves cleaning the data, extracting important features from data, removing duplicate items from the datasets, converting data formats, and many more. Huge datasets are minimized into structural and more usable format using series of Mapper and Reducer functions. This is done by projecting the columns of interest and thus converting it in a format which will be adaptable for final processing. Cleaning text is extremely easy using R language, whereas Pig and Hive supports high level abstraction of data preprocessing.

C. Data Analysis: Before the inception of Bigdata technologies collecting, preprocessing and analyzing terabytes of data was considered impossible. But due to the evolution of Hadoop and its supporting framework the data handling and data mining process seems not so tedious. Programmer with the help of Hadoop Streaming API can write the code in any language and work according to the domain of user. In this stage the pre processed data is studied to identify the hidden pattern. Hadoop provides a Mahout tool that implements scalable machine learning algorithms which can be used for

collaborative filtering, clustering and classification .The analyzed data then can be visualized according to the requirement of the business using Tableau, Silk, CartoDB, Datawrapper.

Thus the whole process of analysis can be explained in a five step workflow:

1. Collecting the data from alien environment and keep it inside the Hadoop Distributed File System.
2. Apply set of MapReduce tasks to the step one collected data and project the columns of interest based on the user query.
3. Keep the preprocessed data in HDFS for further analysis.
4. Use the preprocessed data for analyzing the pattern of interest.
5. Store the result in HDFS so that with the help of visualization tools user can selectively adopt the method of presentation.

5. MODIFICATION OF EXISTING SYSTEM: THESAURUS MODEL

The underline motivation behind this model is the lack of knowledge base in the existing analysis framework which in turn causes the system to follow some unnecessary repetition. Consider an analysis problem to find the maximum recorded temperature in last 5 years. So the analysis is done by

1. Collecting the data from National Climatic Data Center [5] and store in HDFS.
2. Project the field which contains the temperature data i.e. the column of interest.
3. Store the preprocessed result in HDFS.
4. Find the maximum temperature reported by analyzing the (key, value) pair.
5. Store the final result in HDFS.

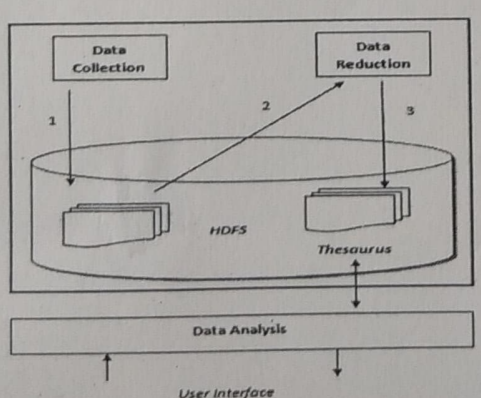

Figure 3 Thesaurus Model

So the maximum temperature of the year is accessed from the file system and can be used for monitoring and reporting purposes. Later if the same analyst needs to find the maximum humidity reported, he has to go through the whole datasets and has to bear the trouble of preprocessing and reducing the data again. This can be avoided by using Thesaurus model. According to this module, minable information are logically arranged and kept in the HDFS so that the future request for the information retrieval can be done in no time. Once the data set is converted into a structural format the schema of the dataset should be specified by the preprocessing programmer so the analyst need not come across the trouble of understanding the newly created data set.. This preprocessed datasets can replace the old datasets so that the unnecessary storage issue is taken care of by the model. The working of the system is specified in two phases, one for collection and preprocessing, and second for analysis. In the first phase the necessary data which can be analyzed are collected and preprocessed. This data is then stored in the thesaurus module in HDFS and made it available for the user to analyze based on the industry needs. Thesaurus not only contains the structured data but also the schema of the data storage. In phase two, the required query can be addressed by referring the schema .Thus analyst need not consider the problems of unstructured data collected by the system. The Figure 3 represents the work flow of Thesaurus model.

1. Collect the data from distributed environment and store in HDFS.
2. Use the stored data for preprocessing.
3. Store the preprocessed data in Thesaurus with a predefined schema. To avoid the storage bottleneck the data that are collected on the first place can be removed as it is no longer necessary.

6. CONCLUSION & FUTURE SCOPE

Mining the inner pattern of business invokes the related trends and interests of the customers. This can be achieved by analysing the streaming datasets generated by the customers in each point of time.Hadoop provides flexible architecture which enables industrialist and even starters to learn and analyse this social changes.Hadoop-Streaming is widely used for sentimental analysis using non-java executables.Also proposed a THESARUS model which works in a time and cost effective manner for analysing these humongous data. Future scope is to enable the efficiency of the system by developing a THESARUS model which is suitable to analyse terabytes of data and returns with the relative experimental results.

7. ACKNOWLEDGMENTS

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Anatomy of Hadoop Mapreduce Execution

Parvathy Gopakumar[1], Neethu Maria John[2]
[1](Computer Science, Mangalam College of Engineering,India)
[2](Computer Science, Mangalam College of Engineering,India))

Abstract : *Storing and monitoring Big data in widely distributed environments for 24/7 is a huge task for global service organizations. These datasets require high processing power which can't be offered by traditional databases as they are stored in an unstructured format. Apache Hadoop is open source software for reliable, scalable and distributed computing. This framework is inspired by Google's MapReduce structure in which application is broken down into numerous small parts and each part can be run in any node in the cluster. This paper contains detailed study of the execution of MapReduce programs over Hadoop cluster .It also discusses how the Hadoop platform offers an easy way of distributed Bigdata computing.*

Keywords: *Hadoop, Map Reduce, HDFS*

I. Introduction

MapReduce is a core component of the Apache Hadoop software framework. Hadoop enables resilient, distributed processing of massive unstructured data sets across commodity computer clusters, in which each node of the cluster includes its own storage. MapReduce serves two essential functions: It parcels out work to various nodes within the cluster or map, and it organizes and reduces the results from each node into a cohesive answer to a query. The volume and veracity of the datasets that are being stored and analyzed by the business are unforeseeable and the traditional technologies for data management such as relational databases cannot meet the current industry needs. Bigdata technologies like Hadoop play a vital role to address this issue. Primary aim of data analysis is to glean actionable logic that helps the business to tackle the competitive environment from this large unstructured datasets. This is possible in the current data centered environment by introducing Hadoop with its Mapreduce implementation . Bigdata analysis has a vital role in the industry to helps the organization to harness their transactional data and use it to identify new opportunities in a cost effective and efficient manner.

II. Problem Statement

Why Hadoop implements MapReduce paradigm?.Doug Cutting stated that with Hadoop, Bigdata is not treated like Bigdata, because a candidate is going to work with only some blocks of data. This can only be done if Hadoop implements the advantages of MapReduce programming like:

1. Data Locality: Pushing processing logic to where data resides.
2. Processing data in parallel, by launching mapper functions in separate nodes.

This structure helps Hadoop in effective utilization of cluster resources by consuming less network bandwidth. Hadoop contains two major components - a specific file system called Hadoop Distributed File System (HDFS) and a Map Reduce framework. Hadoop works on divide and conquer principle by implementing Mapper and Reducer in the framework. Mapper function splits the data into records and converts it into (key,value) pairs. Before feeding the output of the Mappers to Reducer an intermediate Sort and Shuffle phase is implemented in the MapReduce framework to reduce the work load at Reducer machine. The sorted (key,value)pair is given into Reducer phase. The Reducer function does the analysis of the given input and the result will be loaded to HDFS (eg.The maximum temperature recorded in a year, positive and negative ratings in a business etc.).The analyst has to develop Mapper and Reducer functions as per the demand of the business logic.

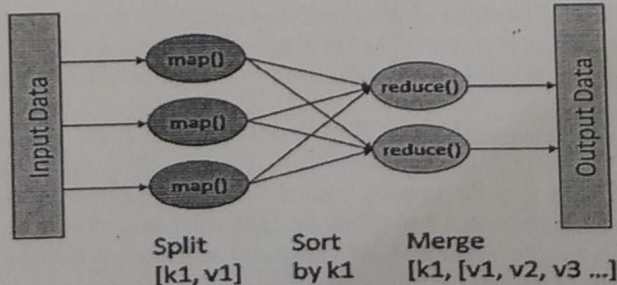

Figure 1 MapReduce

III. Mapreduce Components

1. Client: One who submits a MapReduce Job?
2. Resource Manager: Long lifed high quality hardware which deals with cluster level resource management.
3. Node Manager: Monitors resources on slave nodes.
4. Application Master: It coordinates and manages mapreduce jobs by negotiating with resource manager to schedule tasks. They are short lived and retain only one per application.
5. Container: Created by Namenode when requested by allocating certain amount of resources on the slave node.

IV. Anatomy Of Hadoop Map-Reduce Execution

Once we give a MR job the system will enter into a series of life cycle phases:

1. Job Submission Phase
2. Job Initialization Phase
3. Task Assignment Phase
4. Task Execution Phase
5. Progress update Phase
6. Failure Recovery

In order to run the MR program the hadoop uses the command-'*yarn jar client.jar job-class HDFS-input HDFS-output directory'*,where yarn is an utility and jar is the command.Client.jar and job class name written by the developer. When we execute on terminal the Yarn will initiate a set of actions(see figure 2)

1. Loading configurations
2. Identifying command
3. Setting class path
4. Identifying the java class corresponding to the jar command

i.e..org.apache.hadoop.util.RunJar.Then it will set the user provided command to "*java. Org .apache. hadoop. util. RunJar job-class HDFS-input HDFS-output directory*".

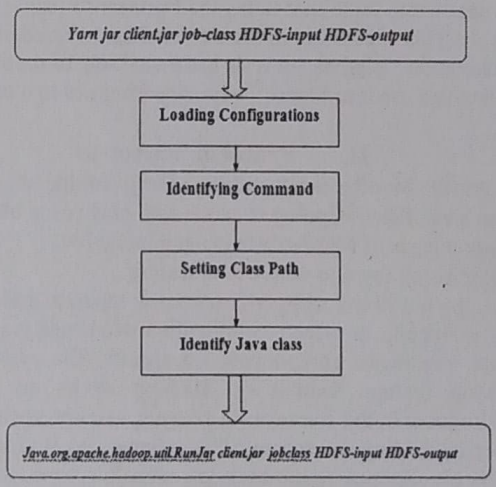

Figure 2 Yarn Actions

The execution system will create a RunJar class and call the main method (see org. apache.hadoop.util.RunJar GrepCode). Main method checks for the its arguments which are the client.jar and its job class name. Thus yarn will execute the job class (word count)with its arguments as the hdfs input and output. Job class then calls its own main method. The ToolRunner.run() method will call any of the trigger method i.e. submit, jobClient.runjob ,waitForComplition, and this will initiate the MR framework in edge node by checking the mapredsite.xml.

The 'map reduce.framework.name' field is visited and pulls the value which can be either YARN, LOCAL, CLASSIC, YARN-TEZ. Corresponding to the value specified a JobRunner instance is created. If the framework is using YARN then the instance created will be RemoteJobRunner, and LocalJobRunner if the value is LOCAL. The instance created then submit the application to the Resource Manager using RPC or Local protocols. Before submitting the application MR framework will create JobSubmitter(JS) instance and initialize the job submission phase of the MR job.

A.Job Submission Phase

The JobSubmitter invoke getNewApplicationId() on Resource Manager to get a new Application id for the job initiated. Then it validates input and output paths given by the user and checks whether the input file and output directory already exist or not. JobSubmitter contact the NameNode and get the metadata .It also compute the input splits ie. How many blocks of data are needed and also creates a shared directory inside Resource Manager with corresponding Application id. JobSubmitter then create a job.xml file which contains the following details of map reduce job, JobClassName,Input,Output,InputFormat,OutputFormat,Number of Splits,,Mapper, Reducer Class,Jar file name etc.. and copy the job.xml to shared directory .Ten copies of client.jar are created and keep the first copy in the shared directory and keeps the remaining nine copies in any configurable nodes in the network. Js submit this application-id to Resource Manager. The workflow is explained as(see figure-3):-

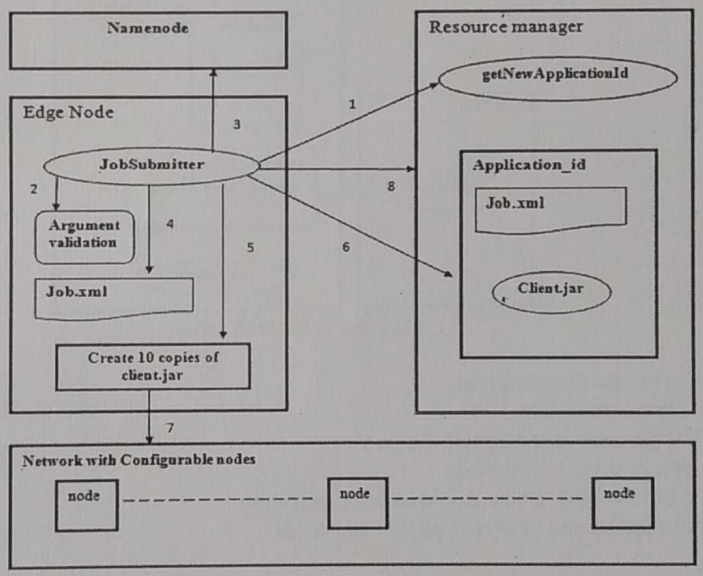

Figure -3 Job Submissions

1. Generate new application id.
2. Validate the user input.
3. Gather metadata from NameNode.
4. Create job.xml file
5. Create ten copies of client.jar.
6. Create a shared directory(job.xml,client.jar).
7. Keep nine copies of client.jar in Datanodes.

B.Job Initialization

Once the job is submitted by the JS the control will move to the cluster side from edge node. Resource Manager contains a candidate called Application Manager which maintains a queue of application ids submitted by the clients. The default name of the queue is 'default'. The applications submitted in the queue are scheduled by 'YARN Scheduler' .To execute the job an Application Master is required, which cannot be created by YARN Scheduler. So a request is given to the Resource Manager to create Application Master. Resource manager will contact all Node Managers(NM) in the cluster to check the container-0 specification (minimum 2 GB and maximum 20GB).If any Node Manager possesses container-0 specification will respond to RM with a positive signal. In the new generations of Hadoop, NM continuously sends heart beats to the RM with its specifications so it's possible for the RM to select NM without network overhead.

Resource Manager will identify what type of application we are executing (YARN is not a MapReduce specific platform, it's a diversified programming approach).Since we are executing MapReduce application type,it wil request thenode manager to create JVM in container-0 and deploy MRAppMaster which is a MapReduce specific AppMaster. This AppMaster acts as the leader which manages the execution of the specified job by initiating it with the application id. AppMaster then go and contact the shared directory in the RM to get the job.xml file. It creates Mappers based on number of input splits specified in the file.ie Number of Mappers =Number of input splits. Reducer count is decided by the developer based on the output load and can

be specified in job.xml.The Job Initialization phase will come to an end when the mapper ids for the required splits are created and add in the queue. The workflow is explained as (see figure-4):-

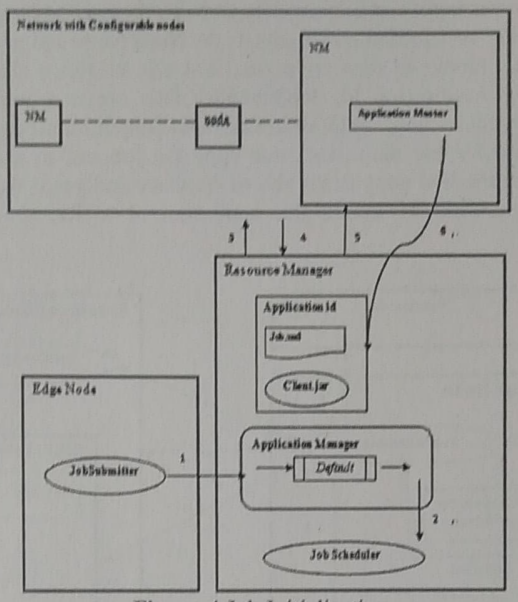

Figure-4 Job Initialization

1. Add application id into default queue.
2. JobScheduler starts scheduling.
3. Check with NM for container-0 specification.
4. NM replays with its own specification.
5. Select and register the NM, create AppMaster for execution.
6. Pull shared information and creates required mapper ids.

C.TASK ASSIGNMENT PHASE

One of the advantages of Hadoop framework is that the data splits are distributed across the network in multiple data nodes .Thus phase three deals with deploying the mapper task in data node which contains corresponding input splits(see figure 5). Thus the burden of processing in one node is distributed among multiple nodes. Application Master uses the data locality concept. It contacts RM for negotiating resources and submit the data node information which satisfy the data locality criteria and keeps the informations.AM initiate YARN child creation on each specified data node with the same application id as their task id and submit the mapper id to be executed and it also create a temporary local directory in the specified data node. Thus the phase three for task assignment comes to an end.

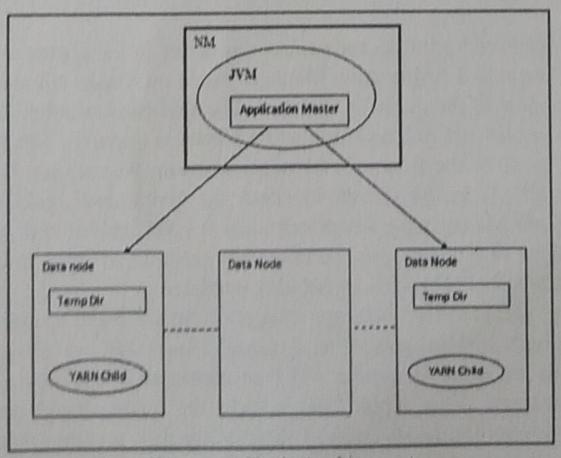

Figure-5 Task Assignment

D.Task Execution Phase

At this point the control is transferred to the particular data nodes which possess the YARN child. It then contact the shared directory on RM to get the related information and copy the files from the shared directory of RM to the locally created temporary directory ie the client.jar and job.xml etc..This is the main theme of hadoop which is pushing the process to data, thus by making data locality possible.

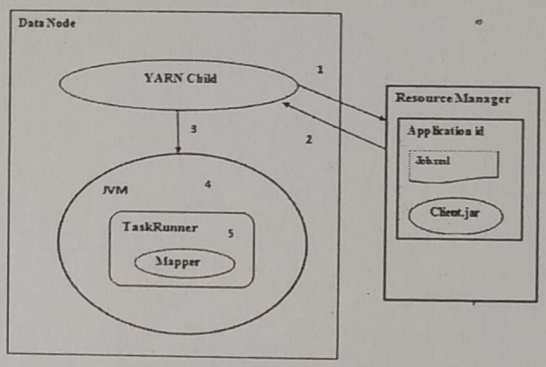

Figure- 6 Task Execution

It then sets the class path to the temporary directory because client.jar should be visible to the JVM which is going to be created by the YARN child. For executing the mapper function the JVM is created and execute a MR related framework called TaskRunner which is a java class object executing on the top of locally created directory .TaskRunner will identify which class should run over JVM ie. The Mapper class in client.jar.It then starts executing the Mapper program. The workflow is explained as(see figure-6):-

1. Request the shared informations.
2. RM transfers the requested files.
3. YARN child creates JVM for execution.
4. Create TaskRunner to run mapper locally.
5. Execute the Mapper program.

E. Progress Update

Once the execution started in distributed data nodes the progress have to be send to the respective initiative modules. Mapper and Reducer JVM execution environment sends progress report to the corresponding AM periodically (every 1second).AM accumulate progress from all MR tasks and communicate to client only if a change in progress happen for every 3 seconds. In reverse client also sends the request of completion in every 5 seconds. Once all the tasks are completed AM cleanup the temporary directory and send the response to the client with the results. Mappers and reducers intermediate output is deleted only when all the tasks got the completion response, otherwise if a reducer fails it still needs the output from the mapper programs.

F.Failue Recovery

Hadoop provides a facility to store the trace of the user and system operation by using FSImage and Edit.logs in the Namenode.The Secondary Namenode checkpoint backup mechanism provides a hard backup technique for hadoop in case if the Namenode goes down.All the informations regarding the executions are saved and if at any point of time the server goes down system calls the log files and restart the execution.Thus the failure handiling is done by the assistance of the framework itself .

V. Conclussion

Hadoop provides flexible architecture which enables industrialist and even starters to learn and analyse social changes.This is achieved by the highly efficient,fault tolerent framework called MapReduce.This paper is a detailed study of how MR jobs are executed in the hadoop cluster and how the distributed parallel processing is achieved by pushing process to data in the framework.

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Secure Data Sharing With Linkable Ring Signatures

Anisha S, Neethu Maria John

PG Scholar, Dept. of CSE, Mangalam College of Engineering, Mahatma Gandhi university, Ettumanoor, Kottayam, Kerala, India

Assistant Professor, Dept. of CSE , Mangalam College of Engineering, Mahatma Gandhi university, Ettumanoor, Kottayam, Kerala, India

ABSTRACT: Data distribution is not easier with the use of cloud computing, and an exact analysis on the shared data provides more profit to both the world and individuals. Data distribution with a large number of participants must take into account many issues, that is competence, data reliability and privacy of data owner. Ring signature is a capable candidate to build an unidentified and authentic data distribution system. It allows a data owner to secretly authenticate the data which can be stored into the cloud or study purpose. Yet the most cost consuming certificate verification for public key (PKI) setting becomes a blockage for this solution to be scalable. Identity-based (ID-based) ring signature, which reduces the process of certificate authentication, can be used instead .Here, further improved the security of ID-based ring signature by providing forward security. If a secret key of any user has been leaked, all previous generated digital signatures that include this user still remain valid. This property is basically important to any big data sharing system. Additional methods are implemented to ensure that two users are controllably linkable.

KEYWORDS: Authentication, data sharing, cloud computing, forward security, linkability

I. INTRODUCTION

In cloud computing, there are a number of security issues are associated. The responsibility of the contributor must make sure that their infrastructure is secure and that their clients data and applications are protected while the user must take measures to reinforce their application and use strong passwords and verification measures. The popularity of "CLOUD" has brought great simplicity for data sharing and collection. Not only can individuals acquire useful data more easily, sharing data with others can provide a number of benefits to our society as well.

As an example, consumers in Smart Grid can obtain their energy usage data in a fine-grained manner and are confident to share their personal energy usage data with others . From the collected data a report is created, and one can compare their energy expenditure with others. Due to its openness, data sharing is always deployed in a unfriendly environment and open to a number of security threats. Taking energy usage data sharing of security threats. Sharing in Smart Grid as an example, there are several security goals a practical system must meet, including:

Consistency of data: The situation of Smart Grid, the statistic energy usage data being confusing if it is copied by opponents. While this issues alone can be solved using well established cryptographic tools, one may meet additional difficulties when other issues are taken into account, such as secrecy and capacity.
Un singularity :Energy usage data contains large data of consumers, from which summary the number of persons in the home, variety of electric utilities used in a specific time period It is critical to protect the secrecy of consumers applications, and any failures to do so may lead to the refusal from the consumers to share data with others.
Effectiveness: The number of users in a data sharing system could be large and a practical system must decrease the computation and communication cost as much as possible. Otherwise it would lead to a waste of energy, which contradicts the goal of Smart Grid.

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II. RELATED WORK

In cryptography, a ring signature is a type of digital signature that can be performed by any member of a group of users that each have keys. Therefore, a message signed with a ring signature is endorsed by someone in a particular group of people. One of the security properties of a ring signature is that it should be computationally infeasible to determine which of the group members' keys was used to produce the signature. Ring signatures are similar to group signatures but differ in two key ways: first, there is no way to revoke the anonymity of an individual signature, and second, any group of users can be used as a group without additional setup.An "identity-based ring signature", is an efficient solution on applications requiring data authenticity and anonymity. Identity-based (ID-based) cryptosystem, introduced by Shamir, eliminated the need for verifying the validity of public key certificates, the management of which is both time and cost consuming. In an ID-based cryptosystem, the public key of each user is easily computable from a string corresponding to this user's publicly known identity(e.g., an email address, a residential address, etc.). A private key generator(PKG) then computes private keys from its master secret for users This property avoids the need of certificates (which are Necessary in traditional public-key infrastructure) Associates an implicit public key to each user with in the system. In order to verify an ID-based signature, different from the traditional public key based signature, one does not need to verify the certificate first .The elimination of the certificate validation makes the Whole verification process more efficient ,which will lead To a significant save in communication and computation When a large number of users are involved.

Ring signature is a group-oriented signature with privacy defence on signature producer. A user can sign secretly on behalf of a group on his own choice, while group members can be totally unaware of being conscripted in the group. Any verifier can be convinced that a message has been signed by one of the members in this group (also called the Rings), but the actual identity of the signer is hidden. Ring signatures could be used for whistle blowing, anonymous membership authentication for ad hoc groups and many other applications which do not want complicated group formation stage but require signer anonymity. There have been many different schemes proposed.

ID-based ring signature seems to be an best transaction among efficiency, data validity and anonymity, and provides a sound solution on data sharing with a large number of members. To obtain a higher level security, one can add more users in the ring. But doing this increases the chance of key disclosure as well. Key disclosure is the primary limitation of ordinary digital signatures. If the private key of a signer is compromised, all signatures of that signer become insignificant, future signatures are invalidated and no previously issued signatures can be trusted. Once a key outflow is identified, key revocation mechanisms must be invoked immediately in order to prevent the generation of any signature using the compromised secret key. However, this does not solve the problem of forgetability for past signatures. The concept of forward secure signature was proposed to preserve the validity of past signatures even if the current secret key is compromised.

The issue of key disclosure is more severe in a ring signature scheme: if a ring member's secret key is exposed, the opponent can produce valid ring signatures of any documents on behalf of that group. Even worse, the "group" can be defined by the opponent at will due to the naturalness property of ring signature. The opponent only needs to include the compromised user in the "group" of his choice. As a result, the disclosure of one user's secret key renders all previously obtained ring signatures invalid(if that user is one of the ring members), since one cannot differentiate whether a ring signature is generated prior to the key exposure or by which user. Therefore, forward security is a necessary requirement that a big data sharing system must meet. Otherwise, it will lead to a huge waste of time and resource.

III. PROPOSED SYSTEM

In this paper, increased security in ID-based Ring Signature is projected, which is an essential tool for building time reducing commercial reliable and unsigned data sharing system. Provided formal definitions on forward secure ID-based ring signatures.

- In ID-based setting, the elimination of the expensive certificate confirmation process makes it scalable and especially suitable for big data analytic environment.
- Key update process only requires an exponentiation.

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- The concept of linkable ring signatures are implemented. They are ring signatures, but with added linkability. Such signatures allow anyone to decide if two signatures are signed by the same group member (in which case the two signatures are said to be linked).
- Improved security in uploading data or signing of messages in reduced amount of time and memory.

The description and analysis of the proposed forward secure ring signature scheme as follows.

3.1 The Design

The identities and user secret keys are valid in to T periods and make the time intervals public.

Setup

For joining a ring group the user or the data owner has to sign up for the first time. The data centre module then approves the user and he is directed to get a key for further processing .The Public Key Generator module generates two random k-bit prime numbers p and q such that $p = 2p +1$ and $q = 2q +1$ where p; q are some primes. It computes $N= pq$.

Extract

When the user joins a group and the data centre approves him, he can upload or download data to the cloud. For this he has to join a group and request for a key. The pkg module distribute the key on request. For user i, where $i \in Z$, with identity IDi $\in \{0; 1\}^*$ requests for a secret key at time period t (denoted by an integer), where $0 < t < T$, the PKG computes the user secret key.

Update

After a specific time interval, the secret key of the user gets expired and for further processing he has to update his key. On inputting the secret key for a time period t, if $t<T$ the user updates the key.

Sign

The user can sign messages on behalf of him after his approval by the data centre module and receiving his secret keys from the public key generator.

Verify

To verify a signature for a message m, a list of identities L and the time period t check all the parameters and the output is valid if all equalities hold, otherwise output invalid.

Opener

The opener module opens the messages signed by the users.

Linker

Linkable ring signatures are ring signatures, but with added linkability: such signatures allow anyone to determine if two signatures are signed by the same group member (in which case the two signatures are said to be linked). If a user signs only once on behalf of a group, the user still enjoys secrecy similar to that in conventional ring signature schemes. If the user signs multiple times, anyone can tell that these signatures have been generated by the same group member.

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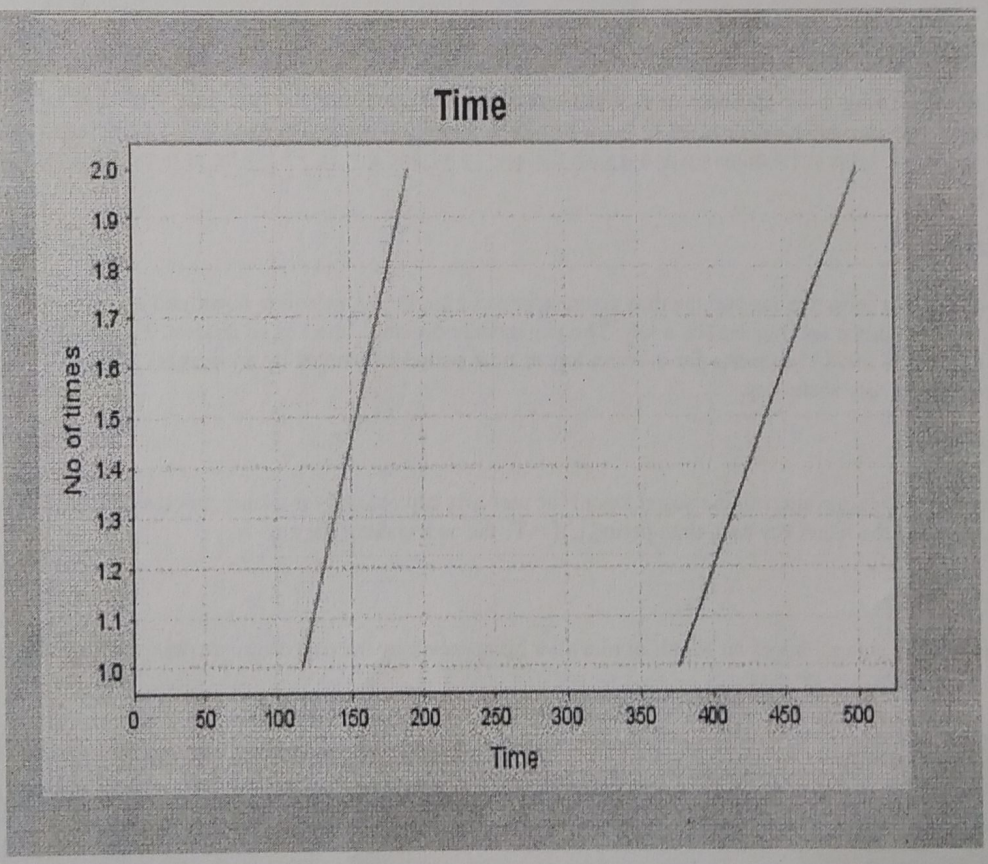
IV. EVALUATION

The performance of this scheme with respect to three entities: the private key generator (PKG) for Increased security, the data owner (user), and the service provider (data centre). In the experiments, the programs for three entities are implemented. All experiments were repeated several times to obtain average results shown in the paper. The results shows that the proposed system is better in performance in both time and memory. Adding forward security can further improve the security protection level. With forward security, the key exposure problem can be solved. This provides a more fair, justice, safety and efficient environment for many business applications.

A number of assessments were done and graphs are plotted on the basis of the results. This shows that that the newly proposed system performs better both in the case of time and memory.



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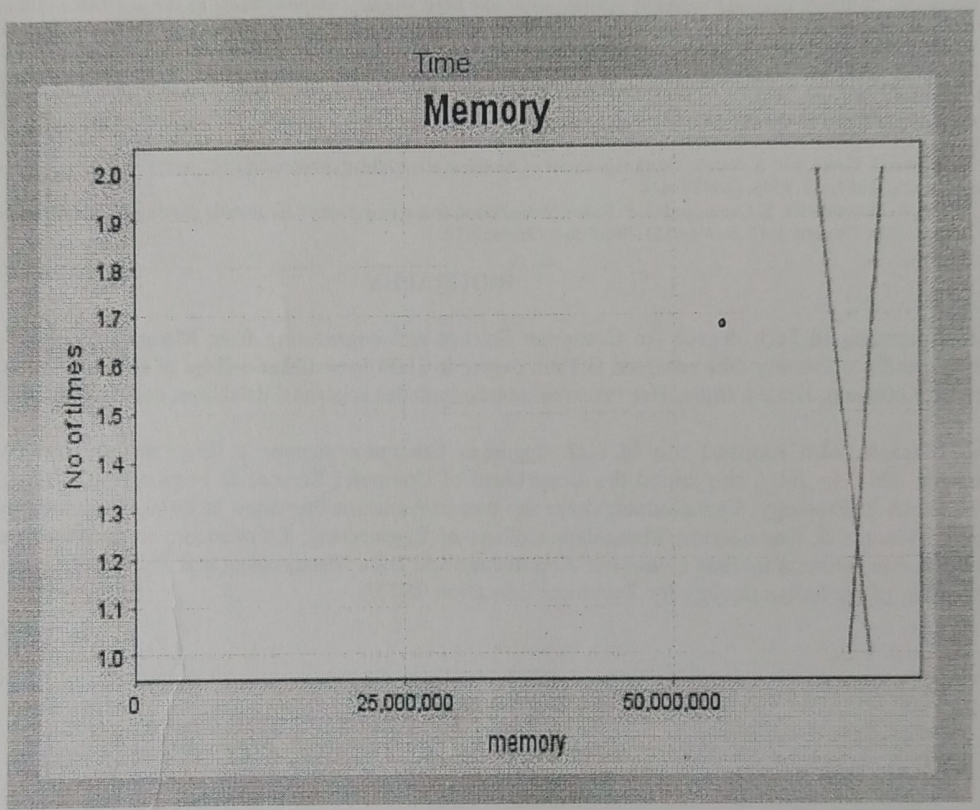

V. CONCLUSION

Encouraged by the realistic needs in data sharing, a new view called forward secure ID-based ring signature is implemented. It allows an ID-based ring signature scheme to have forward security. The scheme provides total secrecy. Scheme will be very useful in many other practical applications, especially to those require user privacy and authentication. In addition to this with added linkability feature allow anyone to determine if two signatures are signed by the same group member. If a user signs only once on behalf of a group, the user still enjoys secrecy similar to that in conventional ring signature schemes.

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BIOGRAPHY

Anisha S pursuing M.Tech degree in Computer Science and engineering from Mangalam college of engineering, Mahatma Gandhi university. She received B.Tech degree in 2009 from Ilahia college of engineering, Mahatma Gandhi university, Kottayam, Kerala, India. Her research interest includes relational databases, security etc.

Neethu Mariya John received the M.Tech degree in Computer science & Engineering from Anna University, Chennai, in 2007. In 2007, she joined the Department of Computer Science & Engineering, Viswajyothi college of Engineering & Technology, Vazhakulam where she was an Assistant Professor. In 2010, she joined the Department of Computer Science & Engineering, Mangalam College of Engineering, Ettumanoor, as an Associate Professor. Her current research interests include Computer Architecture and Data Management and Theory of Computation. She is a Life Member of the Indian Society for Technical Education (ISTE).

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Unsupervised Celebrity Face Naming with HOG Scheme

Anugraha Raj.S, Sreenimol K.R

Post Graduate Student, Dept. of CS, Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala, India

Associate Professor, Dept. of CS, Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala, India

ABSTRACT: Nowadays character identification from popular web videos is very challenging task due to huge variation in the approach of each and every person or celebrity in the web videos .In this paper investigating the problem of missing tag or label detection in unconstrained videos with user-created Metadata. Instead of relying on supervised learning, a better relationship made from image domain and value content. Those relationships mainly include spatial-temporal context and visual similarities. And the knowledge base includes weakly tagged images along with set of names and celebrity social networks. Merging of suitable relationship with knowledge base is done through conditional random field. The proposed system gives three kinds of relationship sets, Face to Face, Name to Name and Face to Name. The new approach introduce here, which can encounter the closest relationship with right feature or faces in web videos, thereby reduce missing tag problem with celebrity face identification to an ideal extent.

KEYWORDS: Celebrity face naming, social network, unconstrained web videos, unsupervised learning, Graph cutting, Histogram of Oriented Gradient (HOG), Speed Up Oriented Feature (SURF).

I. INTRODUCTION

Global video sharing sites like YouTube, Netflix have great important in today's modern lifestyle. Among them YouTube got more popularity. Most of the web videos are uploaded by individuals, in that 80% are people related. In those 70% percentage are celebrity related videos. But unfortunately, majority of celeb-videos suffered with face identification problem. Technically called missing tag or labeling problem which means that the user description along with every uploaded video is insufficient because of several incomplete data. It is not unusual that a pointed celebrity does not appear in the video, and vice versa. One reason behind of this is description is appearing in a video is not mentioned. This will result unsatisfactory video sharing experience.

Title: *Hillary Clinton* and *Barack Obama* Fight!!!!!!!
Description: During the Democratic presidential debate in South Carolina, *Hillary Clinton* and *Barack Obama* engaged in ... past statements on Iraq and refers to a ... about *Ronald Reagon*, and it was on ...

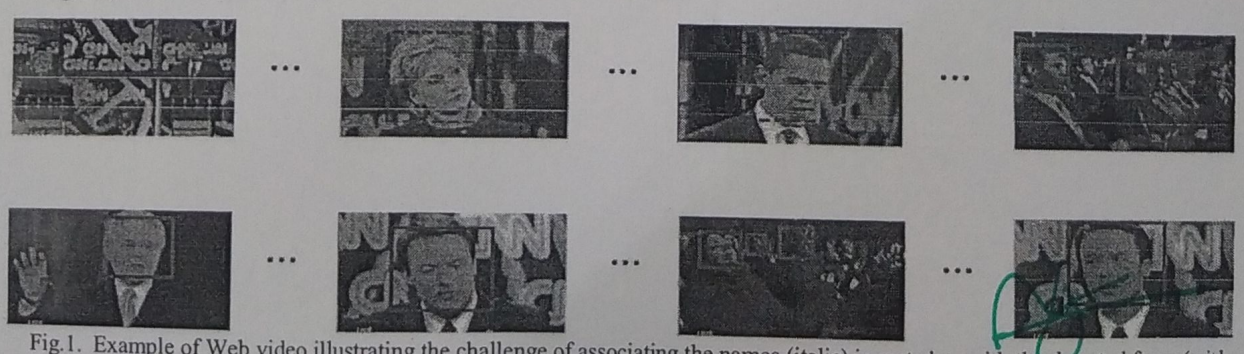

Fig.1. Example of Web video illustrating the challenge of associating the names (italic) in metadata with the detected faces (with bounding boxes) in the video

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Ideal solution is to find a alternative mechanism for right face naming according to metadata information. Merging face and name or any other features within a relationship and followed by this establishment of corresponding metadata can resolve this missing tag problem to good extent. User video experience can be also improved by reducing noisy problems.

Fig. 1 illustrates the problem with a real example of Web video. Out of the fourteen faces (of four celebrities) detected in the video, only four of them have names mentioned in the metadata. Furthermore, among the three celebrities who are mentioned, only two of them appear in the video. In other words, there are missing faces and names in the video and text respectively. Additionally, a common characteristic of Web videos, as shown in Fig. 1, is that faces appear wildly different as a result of motion blur, lighting and resolution changes. In brief, the challenge of name-face association can be attributed to incomplete text labels, noisy text and visual cues.

Here leveraging on rich relationships rather than rich texts [1]–[4] based Web video domain, a method based on histogram oriented gradient (hog) with conditional random field (CRF) [9], [10] is proposed to address the problem of face naming. Typically 3 kinds of relationships are formed in the work. Namely;

i) Face to Face (F2F)
ii) Face to Name (F2N)
iii) Name to Name (N2N)

First two relationships (F2F, F2N) exploits particular relationship with in a single video called within-video. The function is to assign the names mentioned in the metadata with exact face detected in video and it is notated as "null assignment" or "uncertenity".N2N extend the naming system in a single video to 'between video' concept, by performing its task on group of celebrity videos. One benefits of later one is allow the rectification of names incorrectly tagged and the filling in of missing names not found in metadata.

The main contribution of this paper is find a better alternative for face tagging problem in domain unrestricted web videos for celebrity face naming.

II. Related Work

Now currently available research efforts on face labeling mostly concentrate on domain web images [16] – [18] and constrained videos [3]- [9], such as TV serial, news bulletins and movies .All those existing works can be categorized broadly in to three classes: model-based, search-based and constrained clustering-based face labelling.

Name-It [2] one early existing face-name associating system, processes information from the videos and can infer possible name for a given face or locate a face in news videos by name. To accomplish this task, the system takes a multimodal video analysis approach i.e. face sequence extraction and similarity evaluation from videos, name extraction from transcripts, and video-caption recognition. Name-It system can associate faces in news videos with their right names without using a priori face-name association set. In other words, Name-It system extracts face-name correspondences only from news videos. Two categories of information extracted from multiple video modalities have been explored, namely features, which helps to distinguish the true name of every person, as well as constraints, which reveal the relationships among the names of different persons. Multiple instance of learning [20] also another method for face labeling

A very modern form of face recognition scheme is introduced in DeepFace [21]. The network architecture is based on the assumption that once the alignment is completed, the location of each facial region is fixed at the pixel level. Therefore it is possible to learn from the raw pixel values, without any need to apply several layers of convolutions as is done in many other networks.

Search-based approaches investigate and implement a promising search based face annotation scheme. Here mining large amount of poor labeled web images freely available on the WWW. For better understanding, suitable example is mining weakly labeled web facial images for search-based face annotation [22] .Also formulate the learning problem as a convex optimization and develop effective optimization algorithm to solve the major learning task efficiently. To further speed up the proposed scheme also propose a clustering based approximation algorithm which can improve the availability considerably.

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The most related works to this paper are cluster-based approaches. The fundamental assumptions behind of this are that that faces belonging to a person can be densely clustered and hence be exploited for face naming. Existing approaches are Gaussian mixture models (CGMM) [17], [18] graph-based clustering (GC) [17] and face-name association by commute distance (FACD) [23].

III.PROPOSED SYSTEM

A. *Problem definition and Notation: Relationship Modeling*

Given a video in which the inputs to problem of face tagging consisting of a set of observed or detected faces from a video and celebrity names occupied from metadata. Celebrity faces represented as a set $N = \{C_1, C_2, C_3, \cdots\cdots C_M\}$ and celebrity names as sequence $S = (X_1, X_2, X_3, \ldots\ldots X_P)$ where M and P represent count of faces and names respectively. Then the problem can be defined as assigning at most one $C_i \in N$ to $X_i \in S$, from the assignment it is understable that every face in from a video given a name or no name (null). Also the output to the problem represented as the $Y = \{Y_1, Y_2, \ldots\ldots, Y_N\}$ gives the indexed variables which indicate the correct face assignment with exact name.

Conditional random field is used to model the graph for name interference. Inference is accomplished by drawing upon available ''features'' that correspond to each node and each edge. These features include both image data and context from the embedding social network. Mathematical representation is G = (V, E), vertices V = (S, Y) represents set of faces and edges E represent the defined relationship between faces and between face and names. Fundamentally the problem is to trace out possible and suitable label assignments and then periodically pick out the best one as the solution to maximise the probability assignment. As a part of this initially estimate the conditional probability p(X|Y). Following the local Markov property in CRF [12], we assume that two indexed variables $y_i, y_j \in Y$ are independent of each other if there are no edges between them. This can be illustrates by example in Fig.2. The variable y_1 is dependent on variable y_4, but not dependent on variabley_2.The dependent variable is termed as "factor". Here $\{y_1, x_1\}$ is a factor and $\{y_1, y_4, x_1, x_4\}$ is also a factor. The inference of names can be solved with off-the-shelf algorithms such as Markov Chain Monte Carlo (MCMC) [13] or Loopy Belief Propagation (LBP) [14], [15]

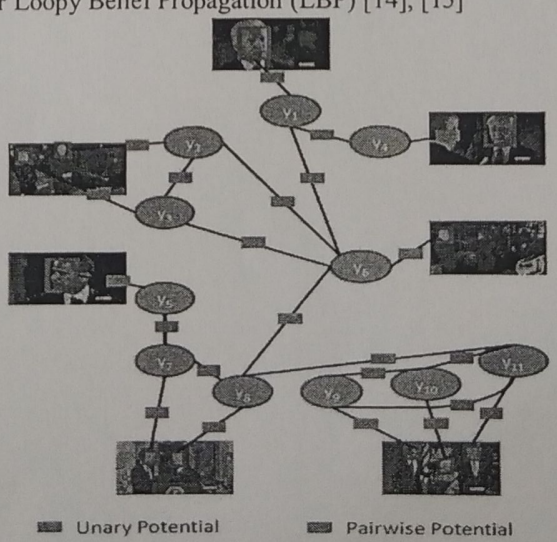

Fig.2 Example of graph depicting the modelling of relationships for face naming as an optimization

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B. *Two types of potentials:*

With respect to the relationship modelling ultimately considering two kinds of [11] potentials, namely unary potential and pair-wise potential. Unary potential includes Face-Name relationship modelling, whereas pair–wise potential considers multivariate relationships.

Unary Potential: The unary potential [15] reads the likelihood of a face x_i being labelled with a name or "null" category. For this purpose, model the name as Multivariate Gaussian Distribution. Uncertainty is the exact term used to indicate the null category. Suppose the uncertainty is higher value then probability is uniformly distributed. Reversely when the probability of labelling name is very high then uncertainty becomes lower.

Pair-Wise Potential: Pairwise potential consist of linear combination of three relations, namely spatial, temporal and visual relations. The pairwise represents noticeable relationship between two faces. In spatial relationship, two frames of different shots, the spatial locations of faces, as well as their overlapping area, give clue to the identity of face. Similarly in temporal relationship, appearance of face at different time period gives clues whether the names assigned to the faces should be unique to each other. But the visual relation represents the background changes and colour changes.

C. *Architecture of Face labeling:*

The whole frame work for the unsupervised celebrity face naming is based on architecture shown in Fig. 3. Input consists of set of frames in a video and each frames includes number of different faces. Each faces have corresponding feature set and find matching among them. If there is a matching then a value is returned that means the corresponding name of the face. Now in (F2F) metadata , the data corresponds to each video that resides. If no matching occurs system searches in to the metadata. Meta data includes video name, frame number and celebrity names etc. By searching, corresponding faces are extracted from the video. As an output from metadata the feature set is generated and matching process restarted with input frames. Suppose matching again results as negative, then searches continuing with second meta data(N2N metadata) which includes images and names, and then find matches the celebrity data .

D. *Celebrity Face Naming with HOG scheme:*

According to the basic concept of face labelling, called Histogram Oriented Gradient (HOG) can be used. HOG is a combination of a series of steps. Before applying HOG scheme initially create the metadata also adds new test images in to the meta data. The whole system following F2F and N2N relationships. The basic objective of HOG system is object recognition. The basic idea behind of HOG system is Local shape information often well described by the distribution of intensity gradients without precise information about the location of the edges themselves. According to celebrity naming problem in HOG based object recognition, initial step is to divide image into small sub-images called "cells". Cells can be rectangular (R-HOG) or circular (C-HOG) . After this accumulate a histogram of edge orientations within that cell. In next stage, the combined histogram entries are used as the feature vector for describing the object.

Orientation binning and block normalization are further steps in here. In orientation binning is generating cell histograms. Each cells contains number of pixel values and these each pixel castes a vote for histogram channel. The basic consideration for this voting will be the values found in gradient computation. The cells themselves can change to rectangular or radial in shape. Also the histogram channels are spread over 0 to 180 degrees or 0 to 360 degrees and that depends on whether the gradient is "signed" or "unsigned". Block normalization is next subsequent step in which , gradient affected by the illumination changes are normalized.

Why HOG in unsupervised celebrity face tagging system? Because it can capture edge or gradient structure that is very characteristic of local shape. But surf based method used in early study not good in recognizing exact shape of the object. Capturing edge or gradient structure that closely relates the characteristic of local shape, within cell rotations and translations do not make changes in HOG values and the illumination invariance achieved through normalization. The method is similar to edge oriented scheme, scale-invariant feature transformation and shape contexts.

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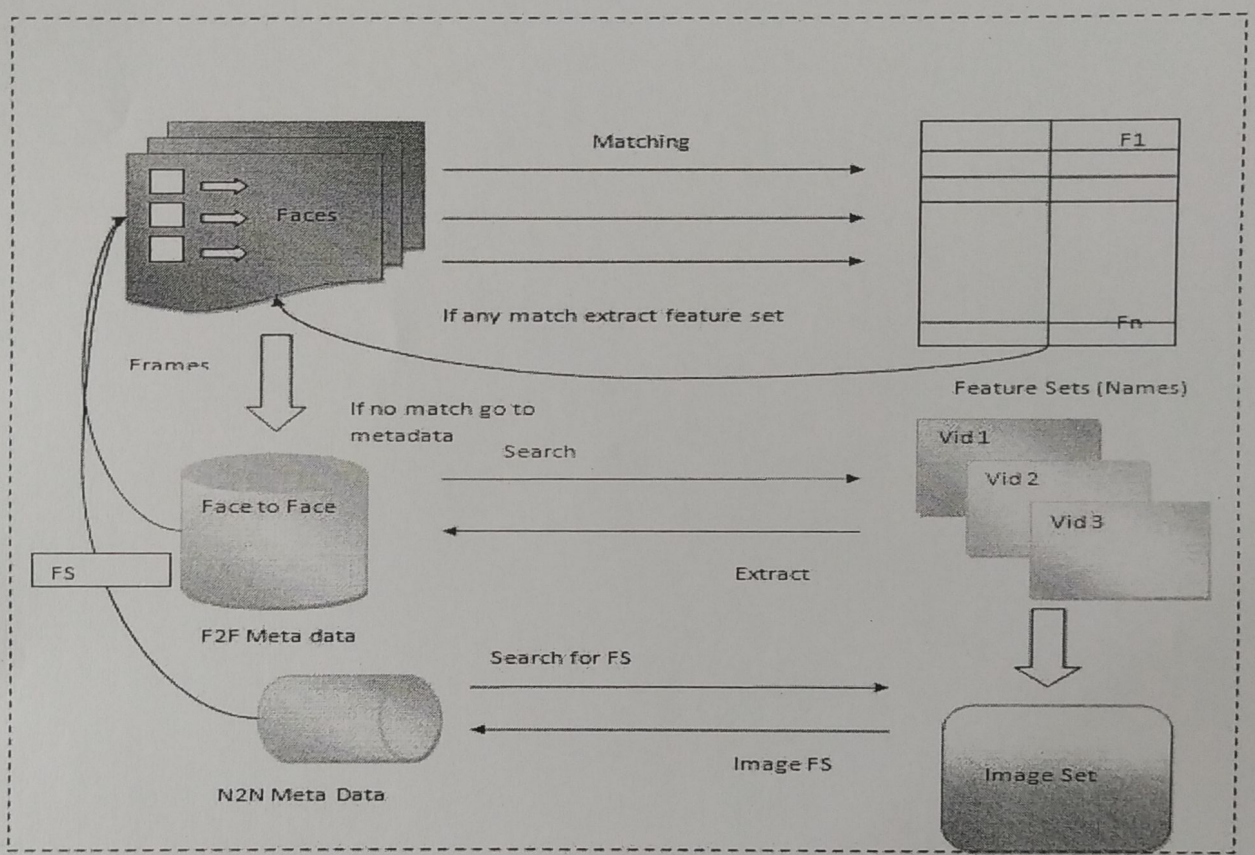

Fig.3 Architecture for unsupervised celebrity face naming framework.

IV. EVALUATION RESULTS

Similar to [16], [17], [19], [23], the performance is measured by accuracy and precision. Both measures count the number of faces correctly labelled, but differ where accuracy also includes the counting of faces without labels.

Note that accuracy and precision are calculated across all the faces in a test collection, rather than averaged over videos. Recalling of matching is not used here because we do not consider the problem of "retrieving all faces given a name", rather we are dealing with the problem of whether a face is labelled with a correct name (precision), otherwise labeled as "null" if the name is missing from metadata (accuracy).

Here evaluation study done on the basis of SURF based face recognition in existing approach [1]. Speeded Up Robust Features (SURF) [24] is a local feature detector and descriptor that can be used for tasks such as object recognition , registration , classification and 3D reconstruction. It is partly inspired by the scale-invariant feature transform (SIFT) descriptor. The proposed method which takes Histogram of oriented gradients as feature set is compared against Surf features. The evaluation is done on the accuracy measurements i.e. no of faces identified on different web videos

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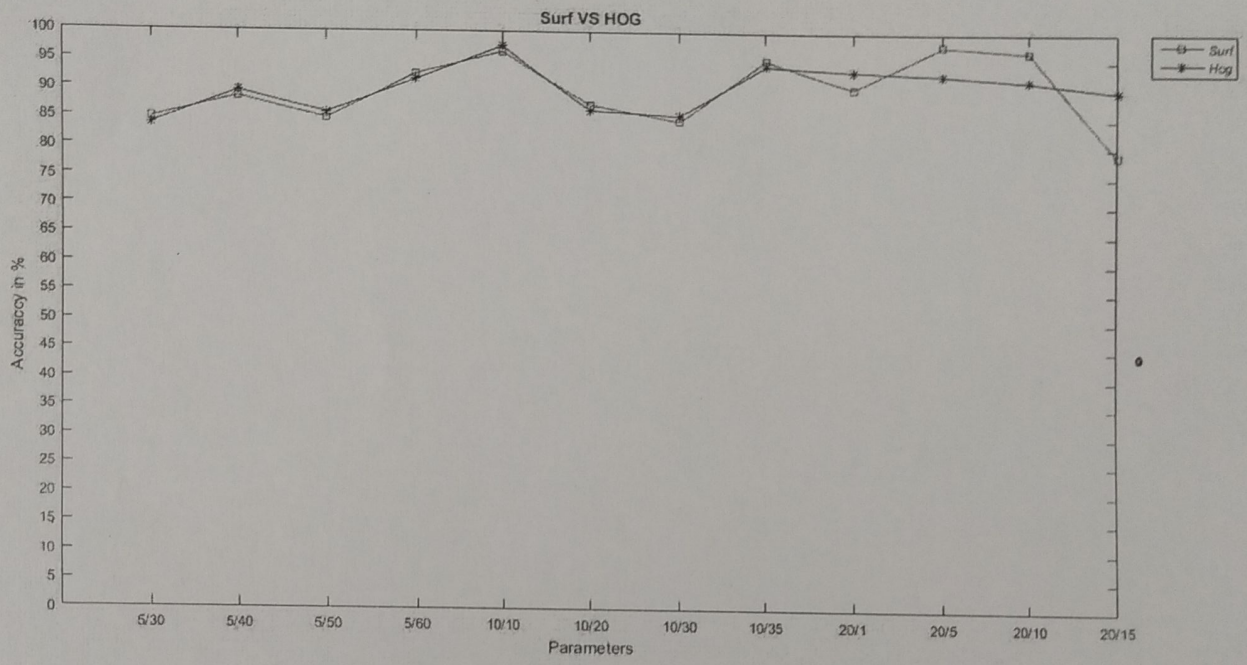

Fig.4 Comparison between surf based face recognition and HOG based recognition method

The proposed face naming system with HOG scheme implemented with MATLAB. Basic idea used for comparison is F2N relationship. For feature matching several parameters are trained. For example in surf based naming, for particular feature point extraction it needs to consider number of parameters like gradient, gaussian parameters etc. Those parameters are here represented with values 5/30, 5/40, 5/50 etc in x-coordinates. The graph shown in the Fig.4 representing the accuracy changes occurs with each parameters used in the experiment also graph shows a generalized result. Both cases include a window size and sigma value, sigma gives the actual Gaussian value. Here in 5/30, 5 is Gaussian value and 30 is the sigma value respectively. To create masking programme wavelength and sigma values are very essentials. According to the graph for an example, if out of 10 images 9 images are detected with exact identity then result is 99 % of accuracy. The good accuracy is resulted if the ratio between parameter is 10:10.So the evaluation results shows that the accuracy level of the new method is vary with ratio between each parameters.

V. Conclusion

The paper represented modelling the solution for celebrity face naming problem .Problem is experimented with a new method in face naming called HOG scheme. Dealing with the incomplete and noisy metadata, CRF smoothly encodes F2F and F2N relationships also permitting null category by considering uncertainty labelling. HOG scheme results a good effect than the previous face labelling method. Shape oriented feature detection based on HOG scheme shows a stable accuracy in almost level of parameter ratio. Therefore experiments results shows that parameter property leads to a good performance superiority over current methods. The price of improvement, nevertheless, also comes along with increase in processing time and the number of false positives.

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BIOGRAPHY

Anugraha Raj.S received the B-Tech from M.G University in 2014 and doing M.Tech in Computer Science from 2014 in Mangalam College of Engineering. Her area of interests includes data mining, security in computing and artificial intelligence.

Sreenimol K.R received B.Tech from Govt RIT ,Kottayam and M.tech from CUSAT, Cochin.She is currently an associate professor in Mangalam College of Engineering, Kottayam. Her area of interests includes data mining, computer architecture, social networks.

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WSRCG: A Framework for Location_Aware Web Service Recommendation and Community Generation

Anugraha Raj .S[1], Sreenimol K. R.[2]

[1]PG Student, Mangalam College of Engineering, Kottayam, Kerala, India

[2]Mangalam College of Engineering, Kottayam, Kerala, India

Abstract: ***Service computing plays an important role in business automation and now a days, there is a rapid increase in web services. Everyone is familiar with different kinds of web service recommendation systems and a number of commonly available web services are steadily increasing on the internet. However, Service users are not aware about availability of the different types of Web Services. Hence the recommendation system has to provide different quality of service. Existing approaches are mainly based on semantic similarity of the service interface and quality of service combined with collaborative filtering techniques. But most of them do not provide exact location-aware recommendation services, because user's tastes are different. Also, it is impractical for users to acquire quality of service information by evaluating all service candidates by themselves. So this paper provides an effective, personalized and location aware recommendation service with improved prediction accuracy, reduced computational complexity compared to previous CF-based techniques.***

Keywords: Web service, Collaborative Filtering, QoS prediction, Similarity Computation, Similar Neighbor Selection, Cosine similarity, PCC.

1. Introduction

Web service defines a framework with standard –based infrastructure model and protocols to support service – based application over internet. Large no of users in the world choose web service from different users and hence the selection of high quality web service among millions of users is non-trivial task. Usage of improper web service in other hand makes lots of problems in the business networks. The web service recommendation is one kind of promotion method for a particular web services. However, service computing plays a critical role in business automation.

Existing web service approaches are based on all-time statistics of usage pattern and overlook temporal aspects. Ongoing recommendation methods are based on semantic similarity of the service interface and quality of service combined with collaborative filtering. The web service system has to provide Quality of services to the users. But for most of the web service, the quality of Quality of service is widely employed to represent the non-functional features of the web services and has been considered as the key factor in service selection. [1], [2], [3] typically a user with a good web service knowledge prefers only good quality of service information .Although user may find different value for the same service. I is impractical to acquire quality information by evaluating all service candidates by himself. The real world web service invocation is time consuming. Moreover, some properties are difficult to compute when long time observation is needed. To rectify these challenges here proposed a new personal aware & localized collaborative filtering framework for web service recommendation.

- The novel location aware web service recommendation approach, fairly improves the recommendation accuracy and the time complexity compared with existing service recommendation approaches.
- Develop a user community that represents the users who are using the typical web service.

2. Related Topics

2.1 Web Service Recommendation

Recommendation systems become extremely common in recent years and are applied in a variety of applications. The most popular are probably movies, news, books, research articles, search queries, [1], [3] social tags and products in general [6]. The recommendation system typically produces a list of recommendations in one of two ways; through collaborative filtering or content based filtering.

2.2 Collaborative Filtering

[1], [4], [6], Collaborative filtering is a well defined prediction method. That is used to find the interest [10] of user on particular item or other services. Collaborative filtering widely employed in commercial service recommendation system such as Net fix and Youtube. The fundamental idea behind this prediction method is to predict and recommend potential favorite items for a particular user employing data.

3. Proposed System

3.1 System Architecture

Architecture shown in Figure 1 represents the advanced web service recommendation framework. The basic intention is that, by contributing the individually observe web service

quality of service information to WSRCG System. Then only service users can get better web service recommendation service. Apart from the user contribution mechanism, web Service Recommender System also controls a number of computers

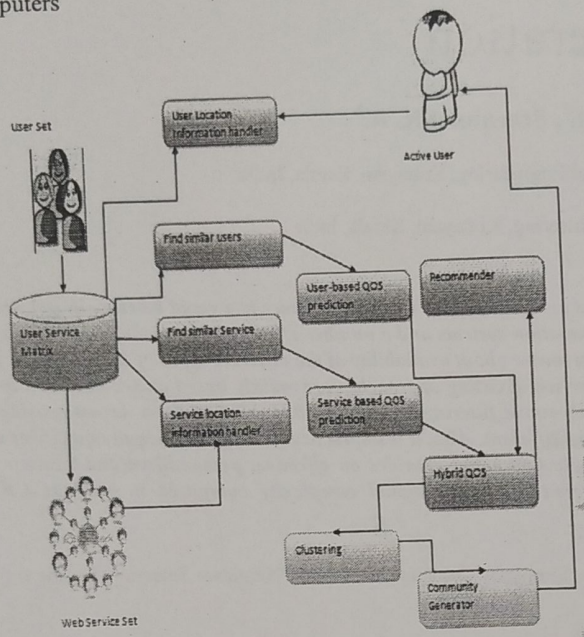

Figure 1: Architecture of WSRCG framework

Most of the web service are monitoring by distributed computers. The system architecture of WSRCG system, which includes a sequence of steps: First an active service user provides the individually collected web service QoS information to the WSRCG system. Then the Input Handler in the web Service Recommendation System processes the input data. Finds for the active user using collaborative filtering algorithm [1] and saves the predicted values and the WSRCG employs the predicted QoS values to recommend optimal web services to the active user .Also the framework gives some additional functionalities. One is generate service user community, with provision of viewing feedback and giving feed backs about their experience on particular service. The other facility is provide fast recovery of recommendation results with a new computation method called Cosine Similarity Formula.

3.2 Module Description

a. Administrator Module

The administration part is the controlling authority of the entire system. It is starting its job from user profile attachment to web service recommendation .user profile is controlled by admin ,that is the user information like location ,IP address ,AS number are required for other computation. There are other sub modules associated with administrator module.

First one is similarity computation module, user-service matrix generation is the responsibility of this module. The matrix represent the similarity between each user and their choose services. In the existing system similarity computation is done with PCC formula. But it fails to consider user's personal influence in to the web service. Therefore here establish a new formula for computing similarity .I.e., cosine similarity formula .When comparing cosine with Pearson Correlation, former incorporates similarity of user into personal influence of web service.

Second sub module is Similar Neighbor Selection module. For predicting missing QoS values, it is necessary to select neighbors right similar to active user. Here the technique used for such prediction is Conventional Collaborative Filtering [8],[10].In some case users give their QoS experience on small number of web service .So when predicting similar neighbor system use this historical QoS similarities.

Third one is QoS prediction and web service Recommender. The major activities are similarity calculation and neighborhood selection for find missing QoS values. For that QoS prediction divided in to two methods.[9] User base QoS prediction and] Item based QoS prediction .In both cases methods used are user based collaborative filtering and item based collaborative filtering respectively. After completing this task the suitable web service with high QoS value is recommended to service user through active users.

b. User Module

In user module, they are responsible for performing a few tasks like profile making, provide their required service features and suggest service for other user. Active user is a part of it .This kind of users provide their own individual web service experience to other service user .Each user in user module controlled by admin module.

c. Service Provider Module

The query as part of user's search for services is first goes to service provider. They are responsible for attaching user information to WSRCG ad-ministration panel. Service provider are of many kind, that is chosen by users.[5]They also collected IP address from user for loc-centre formation [7].Loc-centre contain group user with similar region information. After getting recommendation service from the WSRCG system, service provider configure that service for service users.

4. Algorithm

Here we use Top-K similar neighbor algorithm for finding similar neighbors. Here use conventional CF-based K-similar algorithm and with this algorithm right neighbor similarity to service user is generated [10].

In this paper try to incorporate location of both user and service in to neighbor selection .Sub set of similar neighbor is constructing through several steps. First step, Obtain subset of user within same AS number, if the result is fewer than K-user proceed to second step. Obtain subset of user within same country, if fewer than K-user found proceed to step 3.Third step says that Find subset of user who invoke particular web service.

In each step system search for a mass range of user set , if enough similar user is not found in the previous step[1].From the observation the local users interested to observe similar QoS on co-invoked Web service this algorithm has high

probability of finding similar with active user in his/her local area.

5. Evaluation

Based on the proposed method, here conducted several experiments according to different factors. Here the focus is on the analysis of the following factors;

1) Do correlation between location of QoS affect the frame-work.
2) Change the sparsity condition.
3) Clustering algorithm affects the number of generated users

In addition experiment results are generated with comparison test that done between PCC calculation and Cosine Similarity Calculation. As shown in Figure 2 the graph represent the PCC based similarity range and the Cosine Similarity based similarity range .For plotting graph use similarity values as y-coordinates factor and user id as x-coordinate factor. Similarity measurement is taken by each user's generated PCC value and same user's Cosine similarity value. When analyzing both graphs for each user the cosine similarity value is higher than PCC similarity value. Hence we can conclude that using Cosine Similarity computation gives more accurate similarity results so that service user gets a fast recommendation from the proposed system.

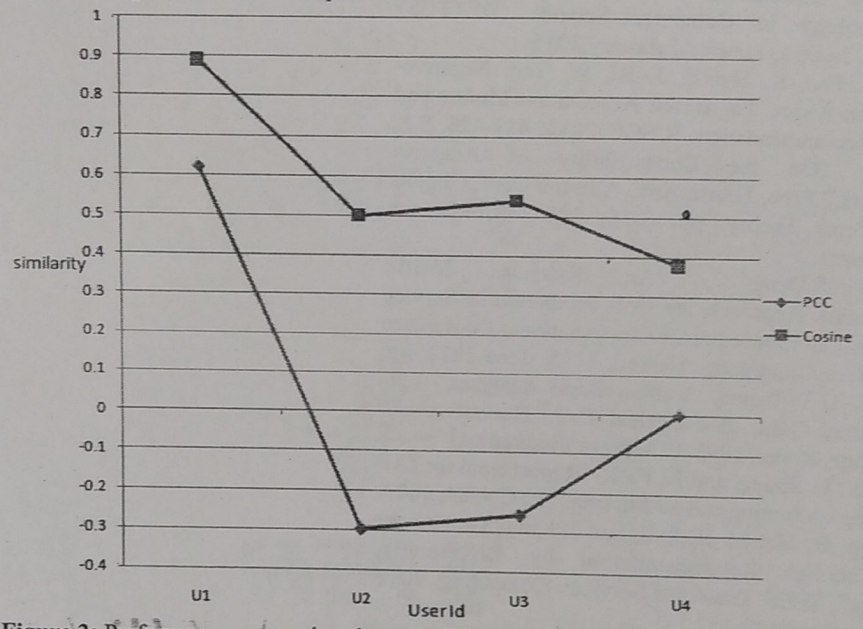

Figure 2: Performance comparison between PCC and Cosine similarity Computation

6. Conclusion

Here represents a collaborative filtering method for location aware web service recommendation and community generation framework. Much improved QoS prediction performance is aiming from this work. For that, take in to account, the personal QoS characteristics from both user and web service cluster .Achieved the incorporate locations of both web services and users into similar neighbor selection for both web services and users.

Experiments on previous techniques (especially on PCC calculation) indicate that our method significantly outperforms previous CF-based web service recommendation methods.

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Author Profile

Anugraha Raj.S received the B-Tech from M.G University in 2014 and doing M.Tech in Computer Science from 2014 in Mangalam College of Engineering. Her area of interests includes data mining, security in computing and artificial intelligence.

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SMC and Proxy server: Privacy Preserving Data Sharing over DDS

Tinimol Andrews, Nimmy Manuel

M. Tech Student, Dept. of CSE, Mangalam College of Engineering, Kottayam, Kerala, India

Assistant Professor, Dept. of CSE., Mangalam College of Engineering, Kottayam, Kerala, India

ABSTRACT:Data should collect safely and accurately while we consider both the performance and privacy of data. Distributed data sharing over providers requires a great challenge over attackers. Data demander(authorised user's) requesting data from multiple distributed data providers, the providers access the data from different base stations. Identity of providers are unknown to the demanders. Noise mixed with the data during transmission and at the reception side, efficient data recovery is carried out. AES half encryption is done in provider side and key server perform authentication function. Shadow matrix computation performed over data for efficient transmission of data. Experimental results shows that privacy preservation of data over DDS (Distributed data stream) using SMC (Shadow matrix computation) and proxy server is more efficient and time consuming compared to traditional approach.

KEYWORDS: Proxy server, distributed data sharing, shadow coding, privacy preserving, data mining.

I. INTRODUCTION

In a distributed environment, collecting data from multiple providers is a challenging task. Data should be collected and stored in secure and intellectual way. Data demander, Multiple providers, Base stations are the basic framework of a distributed environment. A key generator or a server in the middle of demander and provider perform the authentication function. In a normal distributed environment, key server act as an exchange operator between demander and provider. When the demander request file to the provider using demander key, authentication key kept in user side. At that time the provider checks the key and requested file sent to demander from base stations. In the traditional environment, sometimes the key server may become an attacker and catch the demander key in an unauthorised way and request file to provider and access file in a normal way.

In the proposed approach, proxy server act as an authenticated key server. Proxy server not only perform a bridge between the demander and provider but also perform a half encryption on the file for secure transmission. Shadow coding used for privacy preserving and efficient transmission and recoverability of data over distributed data streams. Proxy controls all providers and all files to transfer. Each authenticated users can have the right to access the right files through the authenticated proxy. It provides a fast data recovery within short time and data privacy ensured by double encryption in provider and proxy on files and single decryption at demander side.

II. RELATED WORK

The rapid growth of graphs raises big challenges to the database community. Nowadays, graph structured data are used in numerous applications(e.g.,web graphs,social networks, biological and chemical pathways, transportation networks). High efficiency of graph operations is essential to applications. However, even primitive operations[1] on a graph can be very time-consuming due to the complexity of structural connectivities and graph size. Moreover, real graph datasets are growing rapidly in size, making the attainment of high efficiency even harder.

A table entry[2] is either empty, or it contains one of records, in which case it is fun. It can look for a record with a given key by exhaustively examining all entries of the table. Similarly, a new record can be inserted into the table by searching for an empty position. It is clear that the searches in question can become quite protected for a large collection of records.

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Privacy is becoming an increasingly important issue in many data mining applications that deal with health care, security, financial, behavioral, and other types of sensitive data. It is particularly becoming important in counter-terrorism and homeland defense-related applications. These applications may require creating profiles, constructing social network models, and detecting terrorist communications among others from privacy sensitive data[3].

Propose an algorithm to securely integrate sensitive data[4] , which is horizontally divided among two parties over the same set of attributes, whereby the integrated data still retains the essential information for supporting data mining tasks. The following scenario further motivates the problem. At the same time, new knowledge that results from the integration process should not be misused by adversaries to reveal sensitive information that has not been available before the data integration.

Explosive progress in networking, storage, and processor technologies has led to the creation of ultra large databases [5]that record unprecedented amount of transactional information. In tandem with this dramatic increase in digital data, concerns about informational privacy have emerged globally. The concerns over massive collection of data are naturally extending to analytic tools applied to data. Data mining, with its promise to efficiently discover valuable, non-obvious information from large databases, is particularly vulnerable to misuse.

The main objective in privacy preserving data mining is to develop algorithms for modifying the original data in some way, so that the private data and private knowledge remain private even after the mining process. The problem that arises when confidential information can be derived from released data by unauthorized users is also commonly called the "database inference" problem[6].

A user can have a clear estimation of the knowledge that an attacker can know about him. The knowledge an attacker uses to find the privacy information of a user is called the background knowledge[7]. To provide different levels of privacy protection, allow users to set personalized privacy requirements based on their own assumptions about the attacker's background knowledge.

III. PROPOSED METHOD

Data collection is an important task over distributed environment. Data demander request data to providers. Provider collect the data from multiple base stations. Provider sent data along with noise to demander in a half encrypted form. The key server in the middle perform half more encryption using AES algorithm. Keys are shared via a secured channel over UDP connection. Several techniques are widely accepted to protect the privacy of individual data. Noise can be added along with data to improve security and a high cryptographic algorithms are needed to decrypt the noisy data.

PERTURBATION

To achieve improved privacy over the data to send, adding noise to the actual data. The collected data at demander side remove these added noise and perform decryption to achieve the actual data. There is a less chance of attack to the data when it contain added noise. Provider collect the data from multiple base stations and the location of providers and base stations are hidden to the demander. Better performance can achieve by these perturbation technique and data can be transmitted and recovered in a more secure way.

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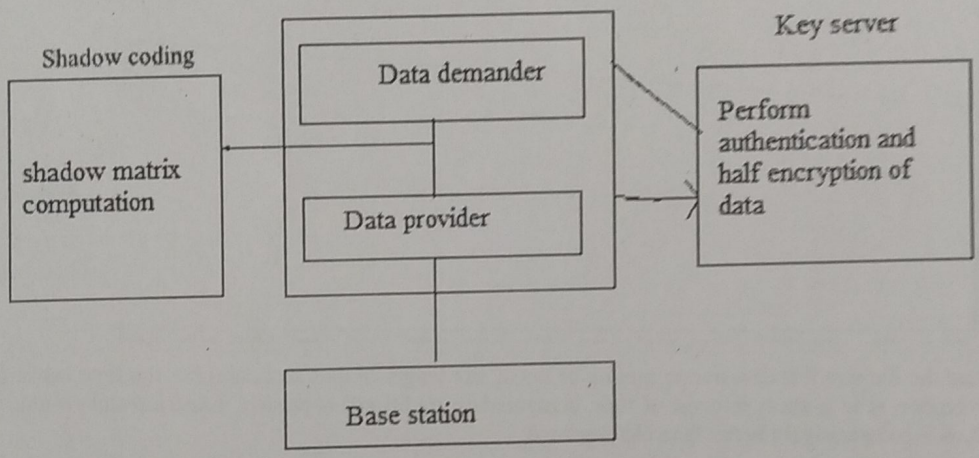
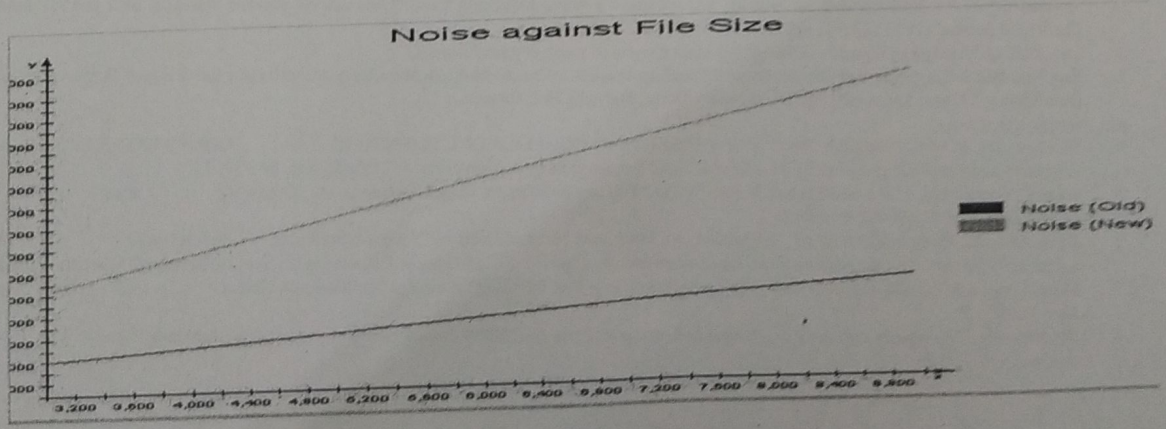
IV. ARCHITECTURE



Demander request data from data providers. Provider collect data from multiple distributed base stations. Shadow matrix computation is performed for the efficient transmission and reception of data. To establish a connection with the provider, demander sent the private key to the key server for authentication. Key server send the public key of provider to demander. Demander access the corresponding provider using that key. Provider generate p1, p2, p3 for provider, Keyser and the demander. P1 and P2 for encryption at provider and key server side and p3 for decryption at demander side. During data transmission at provider side, data encrypted with p1 and send to key server. Key server again encrypt it with p2 and at last the demander decrypt it by using p3.

Perturbation is applied over data for better performance. Experimental results shows that the processing time is less compared to traditional approach and data retrieved in faster way

V. EXPERIMENTAL RESULTS



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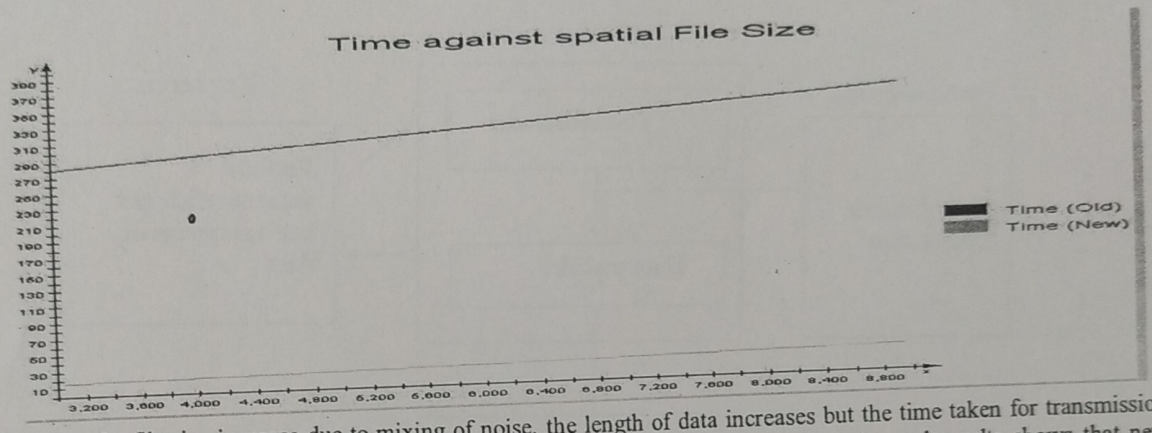
When data is mixed with noise, the length of data will increase. In Traditional approach, Noise mixing is limited to an extent because of the difficulty to recover the actual data. AES algorithm perform better encryption and decryption for efficient transmission and reception of data.



When the file size increase due to mixing of noise, the length of data increases but the time taken for transmission and reception is in a short interval of time compared to traditional approach. Experimental results shows that new approach is comparatively better than old approach.

VI. CONCLUSION AND FUTURE SCOPE

Data collection is a complex task in data mining field. In a distributed environment, complex algorithms are required for efficient transmission of data. Demander request data from providers and provider collect it from multiple distributed base stations. Identity of providers and base stations are hidden from demanders. Key server in the middle of demander and provider act as an authenticated server. Shadow coding applied to data for efficient transmission of data over providers. AES half encryption is done on provider and key server side. AES decryption is done on demander side. Noise is added along with data to achieve better privacy and security over data. Experimental results shows that new approach takes less time to retrieve data from base station and have less chance of attack.

In future, more algorithms and methods can be used to solve asynchronous data sharing over distributed environment.

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BIOGRAPHY

Tinimol Andrews doing MTech CSE in mangalam college of engineering. Receives bachelor of technology degree from mangalam college of engineering in 2013 . Area of interest is Datamining security.

Nimmy manuel works as an assistant professor in mangalam college of engineering. Receives bachelor degree from Mahatma Gandhi University Kottayam in 2006 and master degree from M.S University Thirunelveli in 2012.She has 7 years teaching experience in Computer Science. Area of interest is datamining.

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Optimised Proactive Link State Routing For DOS Attack Prevention

Vishnu S Kumar
Department of Computer Science and Engg.
Mangalam College of Engineering
Ettumanoor, Kerala, India

Divya. S. B
Department of Computer Science and Engg.
Mangalam College of Engineering
Ettumanoor, Kerala, India

Abstract: A Mobile Ad hoc Network is a collection of independent mobile nodes that can communicate to each other via radio waves. The mobile nodes that are in radio range of each other can directly communicate, whereas others need the aid of intermediate nodes to route their packets. Each node has a wireless interface to communicate with each other. These networks are fully distributed, and can work at any place without the help of any fixed infrastructure as access points or base stations. Routing protocols are divided into two broad classes – Reactive and Proactive. In Reactive or on demand routing protocols the routes are created only when they are needed. The application of this protocol can be seen in the Dynamic Source Routing Protocol (DSR) and the Ad-hoc On-demand Distance Vector Routing Protocol (AODV). Wherein Proactive or Table-driven routing protocols the nodes keep updating their routing tables by periodical messages. OPSR proposes a proactive mechanism in source routing.
Keywords: MANET, OPSR, DOS attack

1. INTRODUCTION

A Mobile Ad Hoc Network (MANET) is a group of mobile devices capable of communicating wirelessly with each other without using a predefined infrastructure or centralized authority [1]. Sending packets from one node to another is done through a chain of intermediate nodes. A number of routing algorithms exist for packet transmission in networks. These algorithms can be broadly classified into two main categories: reactive routing and proactive routing protocols. In the case of proactive (table-driven) protocol, for example, DSDV[2] and OLSR [3], [4], every node constantly maintains a list of all possible destinations in the network and the optimal paths routing to it. Reactive protocols, such as DSR [5] and AODV [6], find a route only on demand.

The essential requirement of MANET's is its ability to have all its nodes recognized by other node in the network, even in motion. A route between two nodes can be broken due to intermediate nodes that dynamically change their position. Mobile nodes can join or leave the network at any time.

The Optimized Link State Routing (OLSR) protocol [3], [4], has become one of the algorithms widely used today [7]. Although OLSR is quite efficient in bandwidth utilization and in path calculation, it is vulnerable to various attacks [8], [9]. As OLSR relies on the cooperation between network nodes, it is susceptible to a few malicious nodes which can cause routing havoc. These attacks include link withholding attacks [6], link spoofing attacks [6], flooding attacks [6], wormhole attacks, replay attacks, black-hole attacks, colluding mis-relay attacks, and DOS attacks.

Denial-of-service attack (DoS attack) is a cyber-attack where the perpetrator seeks to make a machine or network resource unavailable to its intended users by temporarily or indefinitely disrupting services of a host connected to the Internet. Denial of service is typically accomplished by flooding the targeted machine or resource with superfluous requests in an attempt to overload systems and prevent some or all legitimate requests from being fulfilled. Denial-of-service attacks are characterized by an explicit attempt by attackers to prevent legitimate users of a service from using that service. The nodes causing denial of service attacks are mostly selfish nodes .

There can be two types of selfish attacks –selfish node attack (saving own resources) and sleep deprivation (exhaust other's resources). Routing protocol plays a crucial role for effective communication between mobile nodes and operates on the basic assumption that nodes are fully cooperative. A selfish node does not supposed to directly attack the other nodes, but is unwilling to spend battery life, CPU cycles, or available network bandwidth to forward packets not of direct interest to it. It expects other nodes to forward packets on its behalf. To save own resources there is a strong motivation for a node to deny packet forwarding to others, while at the same time using the services of other nodes to deliver own data.

At first in Route Update, each node in the network constructed a star graph centered at that node itself. i.e., at the beginning, a node is only aware of the existence of itself. In our proposed model we create selfish node who drops the the packet to next intermediate hop to reach its destination. Normal routing protocols does not detect this threat. But here we form an adjacency matrix of each node based on the network constructed for each node after that we form a spanning tree for each node to find the number of intermediate nodes, as the selfish nodes coursing DOS attack will not be having next intermediate hops their calculated values will be zero and the non attacker nodes will be having values greater than zero based upon their intermediate next hops count. This phase is done at the routing level, so before forming the routing paths the identified selfish nodes are eliminated from routing table and form proactive routes based on this.

The reminder of this paper is organized as follows. In Section 3 the protocols such s ADOV, AOMDV, OLSR, DSR, protocols are presented. A method for protecting OLSR MANET from DOS attack is described in depth in Section 4. Section 5 and describes the simulation model and presents the

results achieved along with a discussion of the results. Finally, conclusions and future works are presented in Section.

2. BACKGROUND

Network Simulator (Version 2), widely known as NS2, is simply an event-driven simulation tool that has proved useful in studying the dynamic nature of communication networks. Simulation of wired as well as wireless network functions and protocols can be done using NS2. In general, NS2 provides users with a way of specifying network protocols and simulating their corresponding behaviors.

Due to its flexibility and modular nature, NS2 has gained constant popularity in the networking research community. NS2 consists of two key languages: C++ and Object-oriented Tool Command Language (OTcl). While the C++ defines the internal mechanism of the simulation objects, the OTcl sets up simulation by assembling and configuring the objects as well as scheduling discrete events.

3. ROUTING PROTOCOLS IN NS2

3.1 Destination-Sequenced Distance-Vector

The Destination-Sequenced Distance-Vector (DSDV) Routing Algorithm is based on the idea of the classical Bellman-Ford Routing Algorithm with certain improvements[2]. Every mobile station maintains a routing table that lists all available destinations, the number of hops to reach the destination and the sequence number assigned by the destination node. The sequence number is used to distinguish stale routes from new ones and thus avoid the formation of loops. The stations periodically transmit their routing tables to their immediate neighbors. A station also transmits its routing table if a significant change has occurred in its table from the last update sent. So, the update is both time-driven and event-driven.

3.2 Ad Hoc On-Demand Distance Vector Routing

AODV discovers routes on an as needed basis via a similar route discovery process[5]. However, AODV adopts a very different mechanism to maintain routing information. It uses traditional routing tables, one entry per destination. This is in contrast to DSR, which can maintain multiple

route cache entries for each destination. Without source routing, AODV relies on routing table entries to propagate an RREP back to the source and, subsequently, to route data packets to the destination. AODV uses sequence numbers maintained at each destination to determine freshness of routing information and to prevent routing loops. All routing packets carry these sequence numbers. An important feature of AODV is the maintenance of timer-based states in each node, regarding utilization of individual routing table entries. A routing table entry is expired if not used recently. A set of predecessor nodes is maintained for each routing table entry, indicating the set of neighboring nodes which use that entry to route data packets.

3.3 Dynamic Source Routing (DSR)

The key distinguishing feature of DSR is the use of source routing. That is, the sender knows the complete hop-by-hop route to the destination. These routes are stored in a route cache. The data packets carry the source route in the packet header. When a node in the ad hoc network attempts to send a data packet to a destination for which it does not already know the route, it uses a route discovery process to dynamically determine such a route. Route discovery works by flooding the network with route request (RREQ) packets. Each node receiving an RREQ rebroadcasts it, unless it is the destination or it has a route to the destination in its route cache. Such a node replies to the RREQ with a route reply (RREP) packet that is routed back to the original source. RREQ and RREP packets are also source routed. The RREQ builds up the path traversed across the network.

3.4 AOMDV Protocol

AOMDV stands for Ad-hoc On-demand Multipath Distance Vector Routing protocol. AOMDV is a multipath extension to the AODV protocol[10]. In AOMDV protocols multiple routes are founded between the source and destination.It uses alternate routes on a route failure. In AOMDV protocols new route discovery is needed when all the routes fail. In AOMDV protocols multipath routing is the enhancement of unipath routing in which advantage is to handle the load in network and avoid the possibility of congestion and increases reliability.

3.5 OLSR PROTOCOL

OLSR is a proactive routing protocol, that is, it is based on periodic exchange of topology information. The key concept of OLSR is the use of multipoint relay (MPR) to provide an efficient flooding mechanism by reducing the number of transmissions required. In OLSR, each node selects its own MPR from its neighbors. Each MPR node maintains the list of nodes that were selected as an MPR; this list is called an MPR selector list. Only nodes selected as MPR nodes are responsible for advertising, as well as forwarding an MPR selector list advertised by other MPRs.

4. OPTIMISED PROACTIVE LINK STATE ROUTING

OPSR proposes a proactive mechanism in source routing. Our proposed method, provides every node with a Breadth First Spanning Tree (BFST) of the entire network rooted at itself. To do that, nodes periodically broadcast the tree structure to its best knowledge in each iteration. Based on the information collected from neighbors during the most recent iteration, a node can expand and refresh its knowledge about the network topology by constructing a deeper and more recent BFST. This knowledge will be distributed to its neighbors in the next round of operation. On the other hand, when a neighbor is deemed lost, a procedure is triggered to remove its relevant information from the topology repository maintained by the detecting node.

With the adjacency matrix calculation and spanning tree we find out the nodes with zero adjacency that is nodes with no forwarding node or intermediate hopes. Attacker nodes will be off no intermediate nodes as they drop the received packets or increases the path length by wasting the bandwidth. After identifying these nodes it will not be considered for routing in our proposed method thus by ensuring a much better safer and less overhead communication.

5. SIMULATION PLATFORM CREATION

For the simulation of nodes in mobile adhoc network (MANET), we have created the platform on Ubuntu. The MANET network simulations are implemented using NS-2 simulator. For this purpose, in NS2 we need to create a topology for the project with which can be used for proactive source routing. The coding will be done using TCL (Tool Command Language). But none of current NS2 versions does not have any proactive source routing mechanism. Source routing included in NS2 is DSR.

For analysis of existing source routing we need to integrate OLSR routing protocol in NS2 which is not part of standard NS2. And it is available as patch file externally. But to integrate this OLSR into NS2 will include some work as it will now compile with the current NS versions. This is done to generate olsr object file with the GCC compiler. NS2 version here we used is NS ALL in one 2.35.

The topology creation will be done using TCL coding. But to edit AODV or DSR or to create a new protocol we cannot code with TCL. Protocol codes are core coded files which is done using C++. So in coding, first thing needs to do the topology and node creations using TCL which uses existing protocol coding within NS all in one version 2.35.

For analyzing the delay, throughput and overhead caused in the existing method we need to capture the packet drop and through put, for this we generate the trace output files of out TCL execution. From this trace output we calculate the drop and throughput using Perl and AWK scripts.

For next purpose we need to find the core code files(written in C++) related to our project in NS. We need to create a new proactive source routing cpp code along with its associate routing and header files, as there is no other proactive source routing code to modify in current NS versions we need create it a whole new one for this. Gcc Complier will be called to compile the new coding and and then will be futher bind with the TCL . This will enable TCL to call the newly created protocol code into topology. And further we can compare delay, throughput and overhead caused of the new PSR with the exixting Protocols including the newly added OLSR.

6. PERFORMANCE EVALUATION AND RESULTS

Here we present the measurement of various parameters by implementing the simulation environment. Throughput is defined as the ratio of the data delivered to the destination of the data sent out by the sources[7]. Average end-to-end delay is the avg. time a packet takes to reach its destination.

End-to-End Delay (EED): It is the time taken for an entire message to completely arrive at the destination from the source. Evaluation of end-to-end delay mostly depends on the following components i.e. propagation time (PT), transmission time (TT), queuing time (QT) and processing delay (PD). Therefore, EED is evaluated as:

$$EED = PT + TT + QT + PD.$$

Throughput: It is the measure of how fast a node can actually sent the data through a network. So throughput is the average rate of successful message delivery over a communication channel.

Packet Sent and Received: It is the total number of packets sent and received during the complete simulation timeframe.

Packet Delivery Ratio (PDR): It is the ratio of the total data bits received to total data bits sent from source to destination.

Control Overhead: It is ratio of the control information sent to the actual data received at each node.

6.1 RESULTS AND ANALYSIS

During the implementation of this project, an attempt was made to compare the performances of various protocols such as AODV, AOMDV, OLSR and PSR under the same simulation environment.

For all the simulations, the same movement models were used, the packet size is fixed to 512 bytes. For the experimental significance, here we only discuss the experimental results of simulation of 6 nodes only. The simulations environment is the same for other nodes of 10,15,20 number of nodes. The diversity of the experiments is more as we increase the number of nodes in a simulation environment.

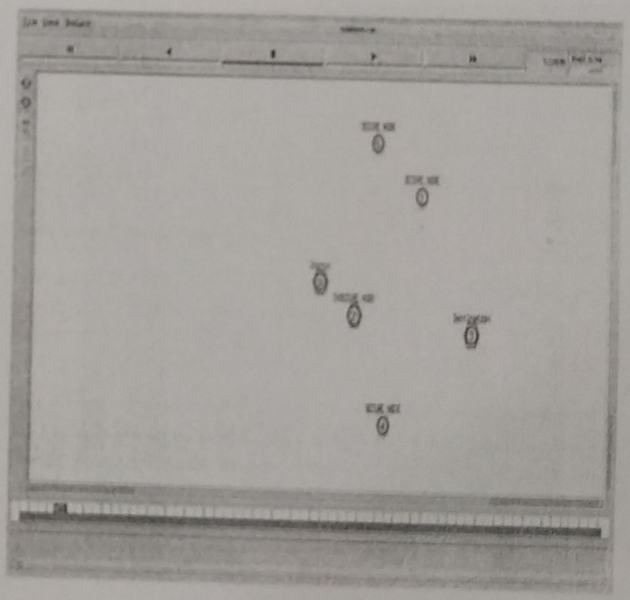

Figure 1: Simulation with 5 nodes

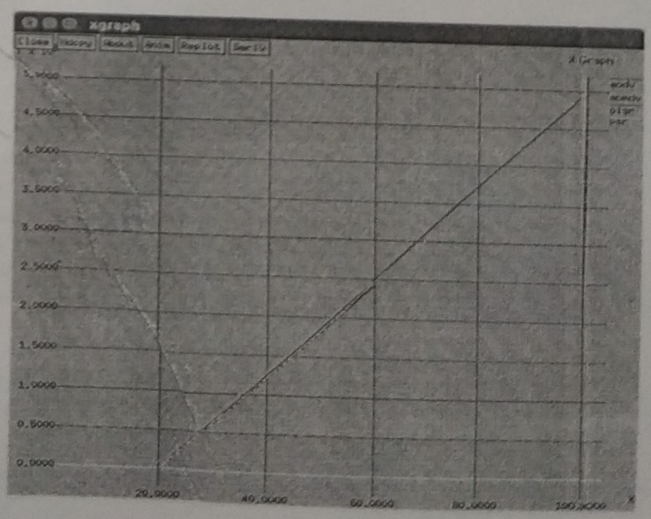

Figure 2: Number of dropped packets

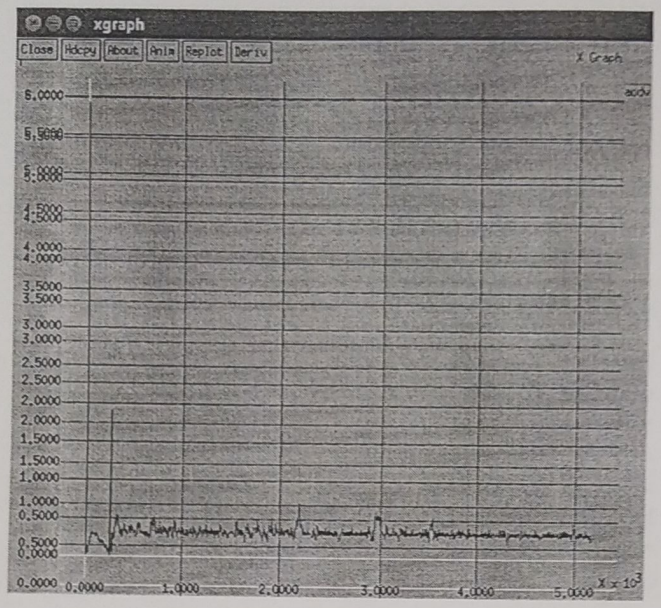

Figure 3: End-to-End Delay in AODV

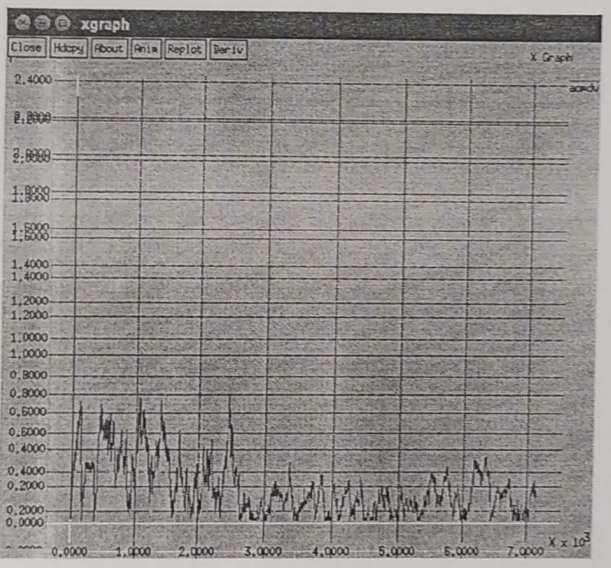

Figure 4: End-to-End Delay in AOMDV

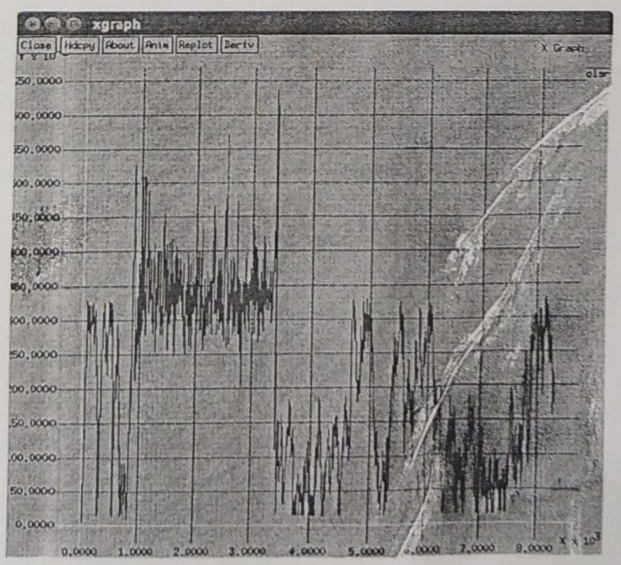

Figure 5: End-to-End Delay in OLSR

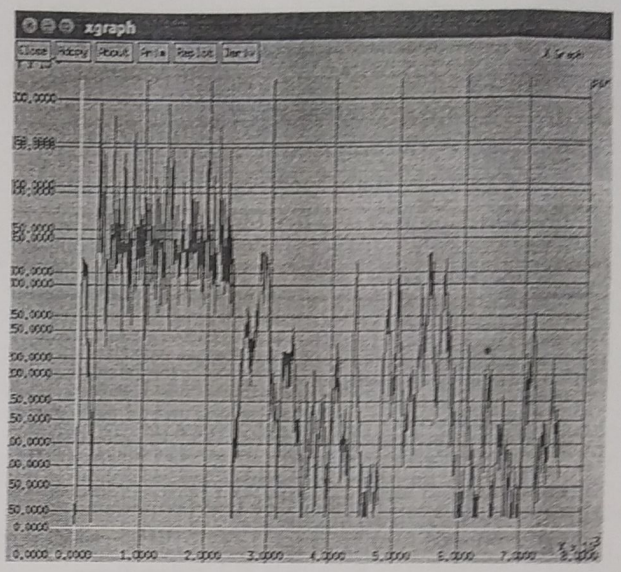

Figure 6: End-to-End Delay in OPSR

7. CONCLUSION

In this project, we evaluated the five performance measurements of various routing protocols such as AODV, AOMDV, OLSR and PSR. Routing protocols were simulated with 6,10, and 15 nodes moving randomly. In this project proposed a new routing protocol called OPSR, a secure extension for source routing protocol in Mobile Ad hoc Networks. Reviewed different routing protocols: Reactive and Proactive. Reactive protocols are on demand protocols. These Protocols do not initiate route discovery by themselves, until or unless a source node request to find a route. The major drawback of this protocol is that its initial delay in path establishment is high.

Proactive protocols are table driven which maintain up-to-date information of routes from each node to every other node in the network. These protocols continuously learn the topology of the network by exchanging topological information among the network nodes. Thus, when there is a need for a route to a destination, such route information is available immediately. Drawback of this protocol is that overhead because every node keep all possible path to every other node in the network. OPSR is introduced to overcome the drawback of reactive and proactive protocols. OPSR design includes three phases: Route Update, Neighbourhood Trimming, and node Update. In the simulation part compared the performance of OPSR with existing protocols such as AODV, DSDV, DSR and OLSR and results are analysed. Proposed model of OPSR reduces overhead and initial delay in route finding and to detect and prevent blackhole attacks in MANETs.

In Future works and development we can add cross layer security to futher improve the security under an attack. And further more parameters like range , bandwidth , assigning trustworthy values by neighboring(which has routing overhead delays and pother drawbacks) in improved ways to enhance our proposed method OPSR .

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CHUI Based Policy Prediction and Image Search on Content Sharing Sites

Neena G.Krishnan, Neena Joseph

Post Graduate Student, Dept. of CSE, Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala, India

Assistant Professor, Dept. of CSE, Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala, India

ABSTRACT: User can share their personal information like images with other users through content sharing sites. Unfortunately the privacy of uploaded images in content sharing site become a major problem. To overcome this problem CHUI based Privacy Policy Prediction framework and NPK for privacy policy based image search are introduced . CHUI (Closed High Utility Itemsets) based Framework determines the best privacy policy for the uploaded images and NPK (Non-Parametric Kernel) for image search in secure way.

KEYWORDS: CHUI ,NPK

I. INTRODUCTION

A privacy policy [10] is a declaration or a lawful document in privacy law. It discloses some or all of the ways a party gathers, uses, discloses, and manages a customer data. It fulfils a legal requirement to protect a customer privacy. Personal information can be used to identify an individual, including name, address, photos , date of birth etc.

Content Sharing [9] refers to the planned distribution of content across appropriate social media such as Twitter, LinkedIN, Facebook [13] and Google +.

Photo is an image. Sharing images are major hobby of members in content sharing sites. Normally the shared images can be accessed by friends as well as strangers due to the flaws in privacy settings .This may lead to exposure of personal information. That is aggregated information can be misused by malicious users.

To avoid such kind of unnecessary exposé of personal images, privacy settings are required. Nowadays such privacy settings are available but maintaining these measures is a tedious and error prone process.

CHUI [3] based Privacy Policy Prediction system and NPK [2] based image search are introduced to overcome this problem .It provides users with an experience of free privacy settings by automatically generating personalized policies and policy based image search.

II. RELATED WORK

Earlier systems shows different studies on automatic assignment of the privacy settings. One such system is Bonneau et al.[4] which projected the concept of privacy suites. It recommends the user's privacy setting with the help of skilled users. The skilled users are trusted friends who previously set the settings for the users.

Danezis [5] introduced an automatic privacy extraction system . Clusters of friends was proposed by Adu-Oppong et al. [6] based on the concept of "social circles". Location-based user privacy was predicted by Ravichandran et. al[7]. This was done on the basis of time of the particular day and location . The study of whether the keywords and captions used for tagging the photos of user can be used more efficiently to create and maintain access control policies was done by Klemperer et al[8]. That is a tag based access control of data in the content sharing sites. Photo tags can be classified as managerial or unrestrained based on the user needs. Social circle based privacy setting was developed by FabeahAdu-Oppong [6] . It facilitates a web based description to secure personal information. Social Circles Finder technique automatically construct the friend's list. Social circle of a person and concentration of his relationship are

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studied and privacy policies are set in this technique. Privacy-Aware Image Classification is introduced by Sergej Zerr[11].

Adaptive Privacy Policy Prediction [1] system is introduced by Anna Cinzia Squicciarini ,Dan Lin ,Smitha Sundareswaran and Josh Wede .The A3P system provides policy based on the user uploaded images . User's individual characteristics , content and metadata of uploaded images are considered for the policy prediction in the A3P system. A3P Core and A3P Social are main two component of A3P System. When a user uploads a data like image, the image will be first sent to the A3P-core. The A3Pcore organizes the image and resolves whether there is a need to appeal the A3P-social. Mistaken of privacy policy prediction in uploaded images is the disadvantage of A3P system.

III. PROPOSED SYSTEM

To improve efficiency of privacy policy prediction in uploaded images CHUI based privacy policy prediction is proposed .NPK based image search is proposed for policy based image search. Each block of the proposed architecture is vital. User can upload image. The uploaded image undergoes image classification. If there is any need of A3P Social, A3P Core accesses it. Otherwise Policy prediction is established. Proposed architecture is shown in figure1.A3P Based predicted policy as well as CHUI Based predicted policy and NPK based image search are shown in figure 1.

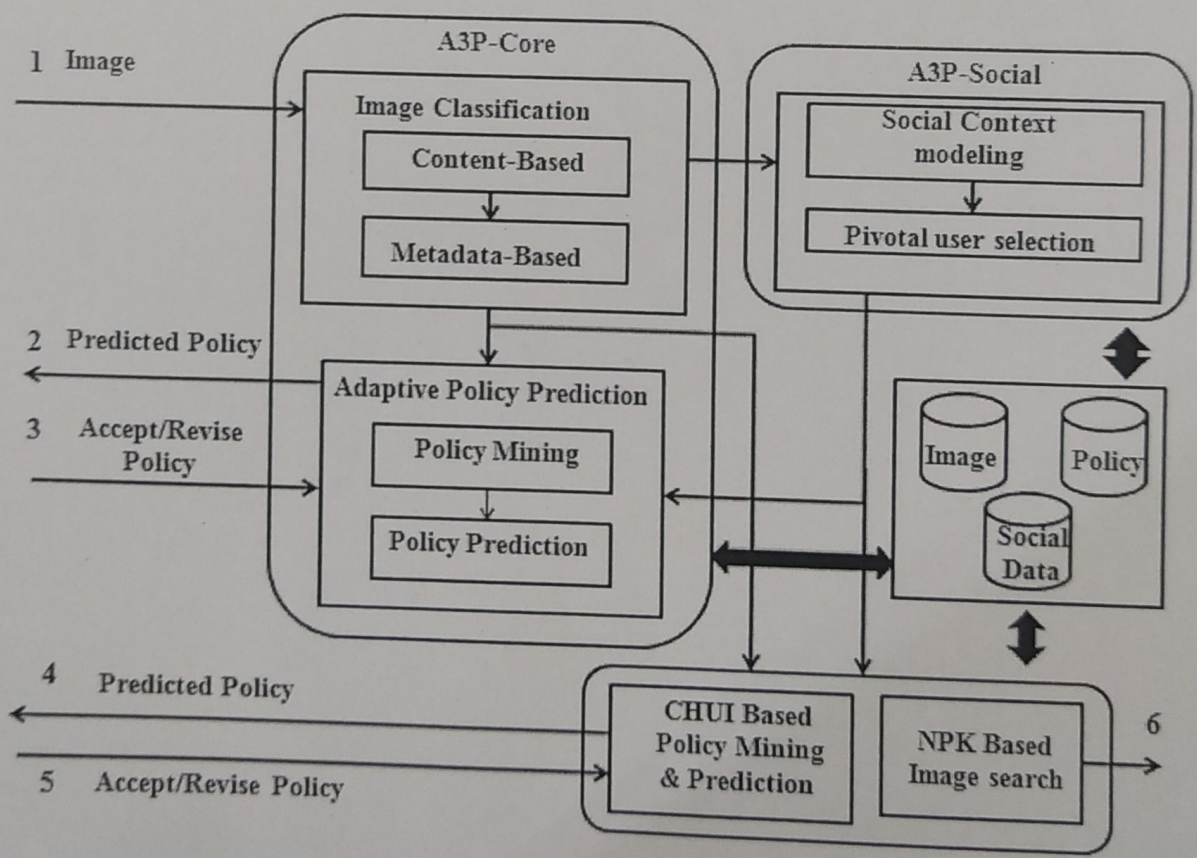

Figure 1: Architecture

Proposed system only consider JPEG and PNG format of uploaded image.
The proposed architecture consists of following blocks:

1) A3P Core
2) A3P Social

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3) Database
4) CHUI Based policy mining and policy prediction
5) NPK Based image search

1.A3P Core

The A3P Core contains two major blocks of the framework.
1. Image Classification
2. Adaptive Policy Prediction

Every image of the user gets classified based on content and metadata .Then its privacy policies are generalised. This approach provides the policy recommendation easy and more accurate way.

1.1.Metadata Based Image Classification

The images are groups into sub-categories in metadata based Image classification. Following steps describe the metadata based image classification.
Step 1 : Keywords are important .It is obtained from the metadata of the image. Metadata includes Tags, Comments and Captions. From these Tags, Comments and Captions keywords are obtained. After obtaining the keywords, identify all nouns, verbs and adjectives and store them into a metadata vector such as
Tnoun={t1,t2,t3,…..,ti}
Tverb={t1,t2,t3,…..,tj},
Tadjective={ t1,t2,t3,…..,tk} where i,j and k are the total number of nouns, verbs and adjectives respectively.
Step 2 :Achieve a typical hypernym from each metadata vector. The hypernym is denoted by h and first retrieved for every ti. Vector form of hypernym and frequency are the normal representation of hyprnym. And select the hypernym with the highest frequency.
Step 3 :Obtain the subcategory in which the image fits in. Incoming new image, the space between these hypernyms and each category is computed and the closest subcategory for that image is discovered.

1.2. Content Based Image Classification

Content-based classification is efficient and accurate image similarity approach. Classification algorithm compares image signatures. The wavelet transform encodes frequency and spatial information related to image colour, size, invariant transform, shape, texture, symmetry of each image. Small number of coefficients are selected to form the signature of the image. The content likeness among images is then determined by the distance among their image signatures.

1.3. Adaptive Policy Prediction

Policy mining and Policy prediction are subpart of Adaptive Policy Prediction
Policy Mining: Policy mining deals with mining of policies by applying different association rules and steps.
Policy Prediction: Based on the strictness level , best policy for the user is chosen. Strictness level decides how "strict" a policy is .It is by returning an integer value. To attain high strictness strict value should be minimum.

2. A3P Social

The A3P-social related to the user's social context and his general attitude toward privacy. A3P social will be invoked by the A3P-core when the system notices significant changes of privacy trend in the user's social circle.

3. Database

Database contain user uploaded images , set of policies and social data.

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4. CHUI Based policy mining and prediction

CHUI(Closed High Utility Itemsets) Based policy prediction is proposed. Itemsets are generated from the metadata of image . Closed high utility itemsets are generated using minimum utility threshold. Utility computation of the itemsets does not produce candidate. CHUI Based policy mining and prediction automatically generate a policy for each newly uploaded images ,according to user's social features.

5. NPK Based image search

NPK (Non-Parametric Kernel) learning technique based image search is proposed. Textual and visual contents of social images ,CHUI Based policy are combined to produce fantastic image search .

When user uploaded an image , select Subject ,Action ,Condition for that uploaded image. Subjects are Friend, Family, Co-worker and Stranger . Actions are View ,Tag ,Comment and Download .Conditions are Location ,Age and Date. User select Subject Family ,Action View and Condition Date 2017 for uploaded image ,only the family member of the user can view the uploaded image upto 2017.
CHUI Based policy prediction automatically predict policy for newly uploaded image. Based on the proposed architecture, an example is shown in below Table 1 . User upload an image , CHUI based policies for that image are

Choose Policy	Family	Friend	Co-worker	Stranger	Image View	Image Tag	Image Comment	Image Download	Date	Location	age
Choose Policy	YES	NO	NO	NO	YES	NO	NO	YES	–	Kannur	–
Choose Policy	YES	NO	NO	NO	YES	YES	NO	YES	2017	Kottayam	–

Table 1:CHUI Based Policy Prediction

User can choose any of the policy or revise the policy.

Kids ,Animal ,Scenery and Explicit are image categories. When uploading an image , user select any of the category . NPK and CHUI Based policy provide good image search experience for user. User input a search query "baby " both NPK and CHUI policy satisfied images are retrieved , it is shown in below Figure 2.

Figure 2: Image Search Result

"View" in the Action list of Uploaded image is only getting as search result. Even though Subject and Condition of the uploaded image are matched and Action is not "View" , then the search result is empty.NPK provides image search based on both textual and visual similarity of image and CHUI based policy. So that a good searching experience is established.

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IV. EVALUATION

Based on the experimental evaluation, out of 20 images uploaded CHUI Based policy prediction automatically predict accurate policies than A3P.CHUI Based policy prediction take minimum time for predict policy than A3P.CHUI Based policy prediction list more policy than A3P.The detailed description is shown in Table 2,Table 3 and Figure 3 ,Figure 4.

In this evaluation, check the performance of CHUI Based policy prediction and A3P in terms of number of policies and time taken for the policy prediction. To facilitate, upload same image and then compare how much policies are obtained in CHUI Based policy prediction and A3P ,compare how much time taken for the policy prediction in CHUI Based and A3P.

Trial No	A3P Based	CHUI Based
1	0	2
5	0	2
10	2	2
15	0	2
20	1	2

Table 2 : Evaluation Based On Number Of Policies

Table 2 shows the performance of CHUI Based policy prediction and A3P in terms of number of policies for the same uploaded image. Trial No is considered as image no. For 1'st uploaded image , A3P shows 0 policy where as CHUI Based policy prediction shows 2 policies. .For 5'th uploaded image, A3P shows 0 policy where as CHUI Based policy prediction shows 2 policies. .For 10'th uploaded image A3P shows 2 policies where as CHUI Based policy prediction shows 2 policies. .For 15'th uploaded image A3P shows 0 policy where as CHUI Based policy prediction shows 2 policies. For 20'th uploaded image A3P shows 1 policy where as CHUI Based policy prediction shows 2 policies .Based on Table 2, Figure 3 is plot. In Figure 3, X coordinate shows Trial No. Y coordinate shows number of policies. Efficiency of CHUI Based policy prediction is higher than A3P in terms of number of policy prediction. User can search image based on CHUI policy also. So that while comparing with previous model, proposed model give efficient searching result and accurate policy. From the Figure 3,easy to understand that CHUI Based policy prediction are fixed ,where as A3P is vary. From the evaluation, it can be stated that performance of CHUI Based policy prediction is efficient than A3P. Search results are also relevant.

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CHUI Based

A3P Based

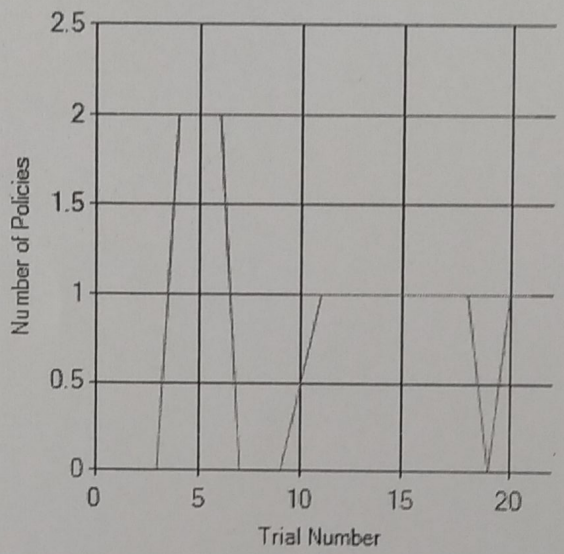

Figure 3: Comparison of A3P and CHUI Based policy prediction in terms of number of policies.

Table 3 shows the performance of CHUI Based policy prediction and A3P in terms of time taken for the policy prediction of same uploaded image. Trial No is considered as image no. Based on Table 3, Figure 4 is plot. In Figure 4, X coordinate shows Trial No. Y coordinate shows time taken for the policy prediction in seconds. Efficiency of CHUI Based policy prediction is higher than A3P in terms of time taken for the policy prediction. User can search image based on CHUI policy also. So that while comparing with previous model, proposed model give efficient searching result and accurate policy within seconds.

Trial No	A3P Based	CHUI Based
1	1.000000000000000	.000000000000999
5	1.000000000000000	.000000000087569
10	87.96003100000000	.000000000000997
15	0.271015500000000	.000000000087569
20	1.431081800000000	.000000000000999

Table 3 : Evaluation Based On Time

From the Figure.4, CHUI Based policy prediction are take less time for policy prediction than A3P.

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CHUI Based

A3P Based

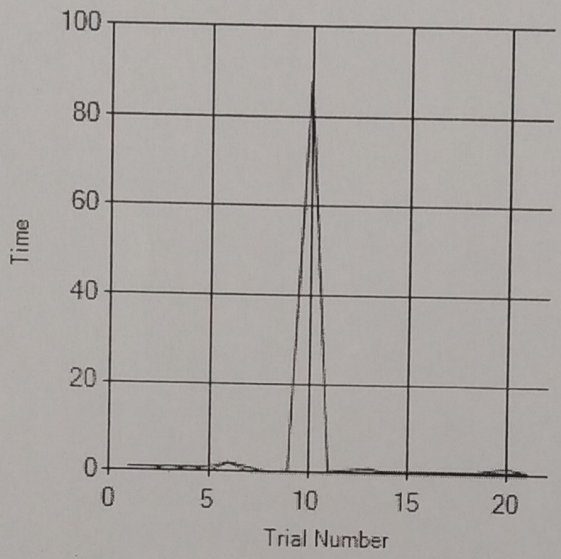

Figure 4: Comparison of A3P and CHUI Based policy prediction in terms of time taken for the policy prediction.

V. Conclusion and Future Work

Comparing with previous model CHUI Based policy prediction can give relevant policy and good image search result. CHUI Based policy prediction determines the best available privacy policy for each newly uploaded image. Both textual and visual based image search exists , which lead to unwanted disclosure and privacy violations. To overcome this problem NPK and CHUI Based image search is proposed.NPK and CHUI Based policy provide good image search experience .So declare that efficiency of the policy prediction and image search of proposed model is higher than earlier models.

CHUI Based policy does not support GIF images [12]. In future methods for identifying policy prediction in GIF images can be introduced. Then it will be one of the efficient model in user uploaded images on content sharing sites in a secure way.

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BIOGRAPHY

Neena G.Krishnan is a Post Graduate student in Department of Computer Science & Engineering, Mangalam College of Engineering, Ettumanoor, Kottayam. She received Bachelor of Technology (B.Tech) degree from Mangalam College of Engineering, Ettumanoor, Kerala, India.

Neena Joseph is Assistant Professor in Department of Computer Science & Engineering, Mangalam College of Engineering, Ettumanoor, Kottayam. She received Bachelor of Technology (B.Tech) degree from Mangalam College of Engineering, Ettumanoor, Kerala, India . and Master of Technology (M.Tech) degree from Achariya College of Business & Technology.

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Efficient Data Access in WSN Using AVGDRA Scheme

Sincy Thomas

Dept. of CSE, Mangalam college of Engineering, Kottayam
Email:sincythomas007@gmail.com

Syamamol T

Assistant Professor, Dept. of CSE, Mangalam college of Engineering, Kottayam
Email:syamamol.t@mangalam.in

Abstract

Wireless sensor network (WSN) refers to a group of dedicated sensors for monitoring and recording the physical conditions of the environment and organizing the collected data at a central location. Most of current research efforts in WSN focus on increasing the life time of sensor nodes, but only limited work have been done on providing efficient data access to users. This paper proposes an efficient mechanism to reduce the data access delay through static sink and mobile sub sinks .This system also increase the lifetime of sensor nodes using an efficient AVGDRA(Advanced Virtual Grid Dynamic Route Adjustment) routing scheme. In this scheme a limited number of nodes to readjust their data delivery routes toward the mobile sink. AVGDRA scheme has two phases, first cell heads needs to updates the latest location of the mobile sub sinks, second are data transferring. For efficient data delivery, nodes need to reconstruct their routes towards the latest location of the mobile sub sinks. AVGDRA scheme aims to minimize the routes reconstruction cost of the sensor nodes while maintaining nearly optimal routes to the latest location of the mobile sub sinks.. Implementation result shows reduced data access delay and improved network life time as compared to existing system.

Index Terms—Routes reconstruction, energy efficiency, mobile sub sink, wireless sensor networks.

1. Introduction

Wireless sensor network (WSN) consists of nodes with sensing and communication capabilities. These nodes can communicate either among each other or directly to an external sink. A larger number of sensor nodes used for sensing over larger geographical area with greater accuracy. Sensor nodes in WSNs are normally battery-powered and become stationary after deployment. When sensor nodes run out of energy it will not provide sensing and data processing .Among the sensing and communication, communication requires more energy. One of the main research areas in WSN is how to increase the life time of sensor nodes. Sink nodes are external to the network and considered as unconstrained in terms of resources. The following Fig.1 shows the structure of Wireless sensor network.

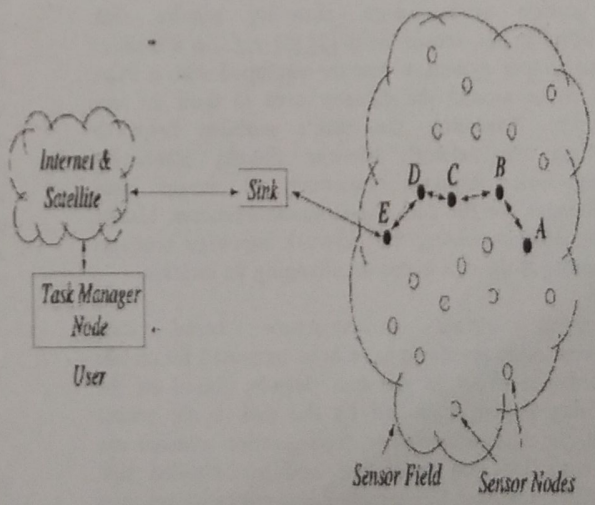

Fig: 1 Structure of WSN

Sink nodes are either static or mobile. Sink mobility have the following advantages:

- Increase the life time of sensor nodes by avoiding the energy-hole problem
- Improved Network coverage
- Improve Network security

Sink mobility have the following disadvantages:

- Routing is complex due to sink mobility
- Increase packet loss ratio
- Increase the data access delay

Considered the above concerns the proposed system uses mobile sub sinks to collect data from sensors and use static sink to collect data from mobile sub sinks. This paper proposed for periodic data collection from WSN other than the asynchronous one. The system increase the network lifetime through less communication overhead and reduce the data access delay through mobile sub sinks.

2. RELATED WORK

In VGDRA [1] scheme create a virtual infrastructure by partitioning the sensor field into a virtual grid of uniform sized cells. VGDRA) scheme that aims to minimize the routes reconstruction cost of the sensor nodes while maintaining nearly optimal routes to the latest location of the mobile sink. This scheme supports only straight line path for communication. Several application environments naturally require sink mobility in the sensor field [2],[3] e.g., in a disaster management system, a rescuer equipped with a PDA can move around the disaster area to look for any survivor. Exploiting the sink's mobility helps to prolong the network lifetime thereby alleviating energy-hole problem; however, it brings new challenges for the data dissemination process. Unlike static sink scenarios, the network topology becomes dynamic as the sink keeps on changing its location.

Several virtual infrastructure based data dissemination protocols have been proposed for mobile sink based WSN in the last decade. Based on the mobility pattern exhibited by the sink in the sensor field, the data collection or dissemination schemes can be classified into controlled and uncontrolled sink mobility schemes. In controlled sink mobility schemes [4]-[6], the mobility (speed and/or direction) of the sink is manipulated and controlled either by an external observer or in accordance with the network dynamics. The uncontrolled sink mobility based schemes are characterized by the fact that the sink makes its next move autonomously in terms of speed and direction.

Chen et al. [7] presented a converge-cast tree algorithm called Virtual Circle Combined Straight Routing (VCCSR) that constructs a virtual structure comprised of virtual circles and straight lines. A set of nodes are appointed as cluster heads along these virtual circles and straight lines. Together the set of cluster-heads form a virtual backbone network. The sink circulates the sensor field and maintains communication with the border cluster-heads for data collection. Hexagonal cell-based Data Dissemination (HexDD) proposed in [8] constructs a hexagonal grid structure to address real-time data delivery while taking into consideration the Dynamic conditions of multiple mobile sinks and event sources. Based on the six directions of a hexagon, HexDD defines query and data rendezvous lines to avoid redundant propagation of sink's data queries. Nodes send their data to nearest border line which is then propagated towards the centre cell. Nodes along the border line store and replicate the data. Sink's data queries are forwarded towards the centre cell and as soon as it approaches a border line node with the relevant data stored, data delivery to the mobile sink starts using the reverse path.

Oh et al. proposed a data dissemination scheme called Backbone-based Virtual Infrastructure (BVI) in [9] that makes use of single-level multi-hop clustering. It aims to minimize the total number of clusters and thus the scale of network overhead associated with informing all the CH nodes about the sink's location information. Multiple Enhanced Specified-deployed Sub-sinks (MESS) in [10], creates a virtual strip in the middle of sensor field thereby placing enhanced wireless nodes (sub-sinks) having more storage capacity at equal distances. The set of sub-sink nodes along the accessible path serve as rendezvous points for the mobile sink and collect and store data from sensor nodes. In data delivery phase, mobile sink floods the query along the virtual strip till it reaches to the sub-sink node owning the data. Upon receiving the query from mobile sink, the sub-sinks route their deposited data to the mobile sink using geographical forwarding approach.

3. AVGDRA SCHEME

In Advanced Virtual Grid Dynamic Route Adjustment (AVGDRA) scheme sensor area is partitioned into equal size cells of grid. Each cell has a cell head to manage all other sensors with in the cell. Based on the

user requirement clusters are formed as a collection of cell heads .Each cluster have an associated mobile sub sink to collect data from all cell headers with in the cluster. AVGDRA support an efficient routing mechanism to obtain the latest location of the mobile sub sinks and data transferring .Due to the mobility of sub sinks the network topology is dynamic so sensor nodes needs to reconstruct the routing path with cost effective way .AVGDRA scheme use the shortest and an ordered path for data communication. In proposed scheme, only a set of cell heads need to take part in the route readjusting thereby reducing the communication cost.

3.1 Network Formation

Sensor nodes are randomly deployed and it should be static. All sensor nodes are of homogeneous architecture and know their location information. Each sensor nodes hold its unique id and its energy status. Mobile sub sinks and static sink does not have any resource constraint. Mobile sub sink periodically collect data from sensors with in the specific cluster. It form a virtual grid structure by dividing the sensor area into equal sized cells based on the number of sensor nodes. Given N number of sensor nodes, the AVGDRA scheme partitions the sensor area into K equal sized cells using the following Equation 1,where K is a squared number

$$K = \begin{cases} 4 & N*0.075<=6 \\ 9 & 6<N*0.075<=12 \\ 16 & 12<N*0.075<=20 \\ . & ..... \\ & ..... \end{cases}$$

Random sized Clusters are formed based on the user requirements. While forming clusters the entire width of the sensor area is divided by the number of clusters. Half of the resultant value is set as a range value .Then find out the adjacent cell heads, which are within the communication range of each cell head. Form a cluster that contains cell head, which have large number of adjacent cell heads and its adjacent cell heads. A mobile sink is placed near to the cell head which have large number of adjacent cell heads. The cell heads which are part of the current cluster formation are removed from the list and find out the adjacency among the remaining cell head for forming other cluster. If the number of cell is less and the number of cluster requirement is high some clusters may be empty.

3.2 Manage Sub Sink Mobility

Each cluster has an associated mobile sub sink, its mobility is limited with in the cluster range. Sub sink knows the position information about all the cell heads within its cluster range. Sub sink collect the data from its associated cell heads and forward it to the static sink which is external to the sensor area. The sub sink moves within the cells or the same cell of its corresponding cluster .For effective communication the cell heads need to know the latest location of its corresponding sub sink.While moving, sub sink creates an orderd shortest routing list of cell heads based on the distance from sub sink.Sub sink send the location update information to its nearest cell head that forward it to its neighbor node. Each cell head uses shortest routing list to find out its neighbor node.

3.3 Data Collection

There are two levels of data transferring one from cell heads to sub sink and other from sub sinks to static sink. While getting the sub sink location information each cell head set its neighbor as which node gives the information. Neighbors of the Cell heads nearest to the sub sinks should be a sub sink.Each cell head periodically collect the local data and forward it to the sub sink. In proposed system data transferring is very fast and packet loss ratio is very less as compared to the existing system. Sub sinks forward data to the static sink based on the shortest routing list, which may be changed during the movement of sub sinks.

3.4 Cell Head Rotation

An important part of the AVGDRA scheme is rotating the role of cell head to every node in the cell. Cell heads are normal nodes with the same characteristics of other sensor nodes. The cell head collect the local data and forward to the mobile sub sink it causes high energy dissipation of cell head nodes. To prolong the network life time the role need to be rotated among all nodes within the cell. The proposed system track the energy level of the current cell head, where it below a particular level the new cell head is selected. The new cell head have high energy level and low distance from mid-point of the cell as compared to other sensor nodes.

4. ARCHITECTURE

Fig.2 shows the architecture of the proposed system. Sensor nodes are deployed randomly to the sensor area. Sensor area is divided as equal sized cells. Each cell has a cell head. Cell heads are selected based on the energy level and centrality. Based on the user requirements clusters of cell heads are created. Each cluster has its corresponding mobile sub sink. A static sink is placed external to the sensor network. Cell head collect data from the sensor nodes with in its corresponding cell. Mobile sub sink collect data from the cell heads with in the corresponding cluster.

Before sending data to mobile sub sinks each cell head need to update the latest location of Mobile sub sink. Based on the latest location of the mobile sub sink a cell heads are sorted based on the shortest distance from mobile sub sink .Cell head uses this ordered shortest path for data transferring in effective way. During the continuous data communication energy level of cell head is reduced. It may causes dead sate of the cell head and network failure occurred. For avoiding the dead sate of cell head, periodically change the cell head of the cell.

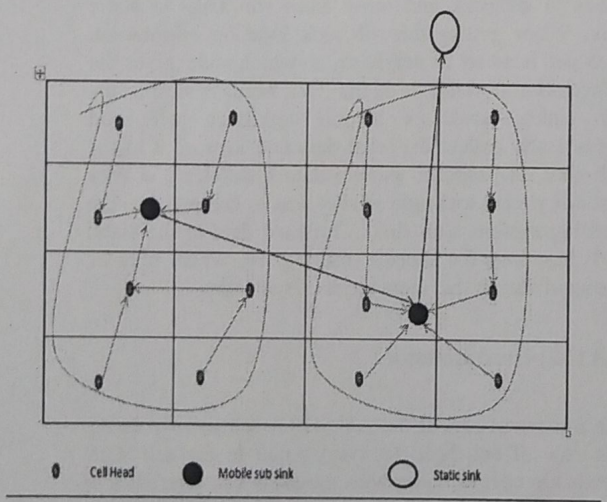

Fig: 2 System Architecture

5. EXPERIMENTAL RESULTS

Performance evaluation of the system is done by collecting the required information while running the system with existing VGDRA scheme and proposed AVGDRA scheme. The following diagram Fig.3 shows the performance of the system based on the data access delay. Each sensor nodes periodically transfer the sensed data to the sink nodes. Data access delay is calculated by the time taken to the sink node for collecting data from all sensor nodes in the sensor area. The proposed systems have high performance in data access delay by using mobile sub sinks. X-axis of the diagram represents the number of cells and Y-axis represents the delay. While increasing the number of sensor nodes data access delay increased very slow in the proposed system but it increased very fast in existing system.

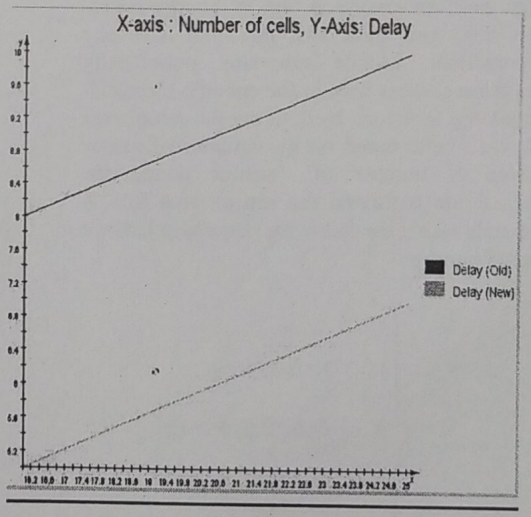

Fig: 3 Performance based on the data access delay

Fig. 4 shows the performance of the system based on the energy level of the system. Energy level is calculated by the sum of energy level of all the cell heads before and after a complete periodic data transmission. Here the load of the cell head near to the sub sink is very less as compared to the existing system. . X-axis of the diagram represents the number of cells and Y-axis represents the energy level.

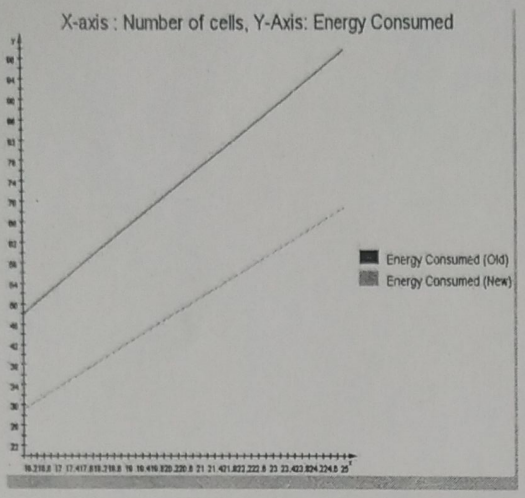

Fig: 4 Performance based on the energy

6. Conclusion

AVGDRA scheme partitions the sensor field into a virtual grid and constructs a communication path through the cell heads. A mobile sub sink while moving within the cluster field keeps on changing its location and interact with the closest cell head for data collection. AVGDRA scheme that incurs least communication cost while maintaining nearly optimal route to the latest location of the mobile sub sink. For effective data transferring between cell heads and mobile sub sink uses the shortest path routing mechanism. A static sink is placed external to the sensor area for reducing the data access delay. The implementation result shows the improved performance as compared to the existing system. The proposed system is more effective in very large sensor field. Using multiple mobile sub sinks easily manage a large number of sensor nodes very fast.

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Rapid Med: A Highly Secured IoT Based Modern Emergency Care System Using Body Sensor Network

Ahammed Meeral[1], Jinu Joy[2], Gayathri R Krishna[3]

U.G. Student, Department of CSE, Mangalam College of Engineering, Kottayam, Kerala, India[1]

U.G. Student, Department of CSE, Mangalam College of Engineering, Kottayam, Kerala, India[2]

Asst. Professor, Department of CSE, Mangalam College of Engineering, Kottayam, Kerala, India[3]

Abstract— **In the modern health care environment, the usage of IoT technologies brings convenience of physicians and patients, since they are applied to various medical. The body sensor network (BSN) technology is one of the core technologies of IoT developments in healthcare system, where a patient can be monitored using a collection of tiny powered and lightweight wireless sensor nodes. The main objective of this project is to transmitting the patient's health monitoring parameters through wireless communication in an emergency situation. However, the development of the new technology in healthcare applications without considering security makes patient privacy vulnerable. In this paper, we also discuss the major security requirements in BSN-based mobile healthcare system. Subsequently, we propose a highly secured IoT-based modern emergency healthcare system using Body Sensor Network, called Rapid Med, which can efficiently accomplish those requirements.**

Index Terms— **Internet of Things (IOT), Security issues, Ardino Microcontroller, Body Sensor Network, data privacy, data integrity, Authentication**

I. INTRODUCTION

The body sensor network (BSN) technology is one of the most imperative technologies used in IoT-based modern healthcare system. It is basically a collection of low-power and lightweight wireless sensor nodes that are used to monitor the human body functions and surrounding environment. Since BSN nodes are used to collect sensitive (life critical) information and may operate in hostile environments, accordingly, they require strict security mechanisms to prevent malicious interaction with the system and body sensor network helps to people providing healthcare services like medical data access, medical monitoring and communication with family members, doctors and emergency unit in emergency situations through SMS [11]. It also provides fully remote method to acquire and detect and monitor the physiological signals without any interruption in patient's normal life. The body sensor network improves life quality.

The present monitoring system sensor is placed beside the monitors or PC, which have limitation of patient's bed. But in modern system we used wireless network and wireless devices which removes the limitation of patient's bed. To make human life more comfortable body sensor networks are an emerging technology in existing research and have the potential to transform the way of human life (*i.e.*, make life more comfortable). A wireless sensor is the smallest unit of a network that has unique features, such as, it supports large scale deployment, mobility, reliability *etc.*

The modern health technologies using Body Sensor Networks are mainly focusing on the reliability, cost effectiveness, power consumption. Most of them only address the requirement for security and privacy. The implementation of healthcare applications without considering security makes patient privacy vulnerable [4]. The security of the patient health information is one of the issues. At present day the human life is uncomfortable to understand the critical conditions of human body easily and quickly. The body sensor network helps to people providing healthcare services like medical data access, medical monitoring and communication with physician in emergency situations through SMS [1].

II. PROPOSED SYSTEM

The paragraph gives a detailed idea of the body sensor network technology is one of the most imperative technologies used in IoT-based modern healthcare system. Rapid Med can efficiently accomplish various security requirements of the BSN based healthcare system.

BSN nodes are used to collect sensitive (life-critical) information and may operate in hostile environments, accordingly, they require strict security [2]. The Rapid Med uses the 3 tier architecture which consist of four sensors that are used to take the physiological parameters from the patient body. Each sensor node is integrated with bio-sensors

such Blood Pressure (BP), Temperature sensor. These sensors collect the physiological parameters and forward them to a coordinator called Local Processing Unit (LPU), which can be a portable device such as PDA [1].

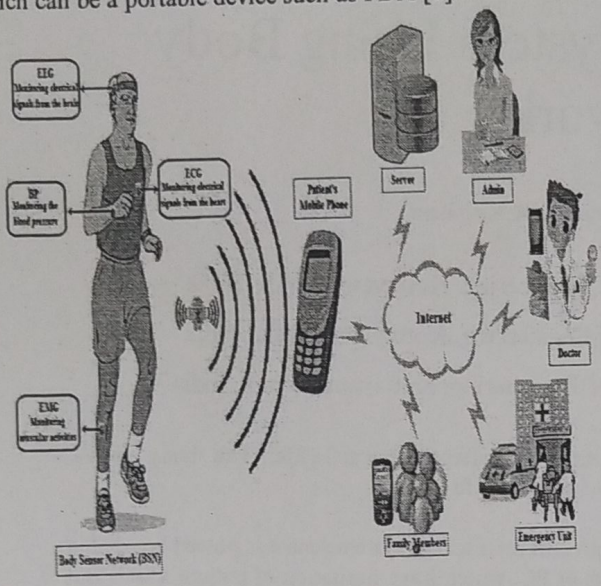


Fig 2.1 System Architecture

The Arduino Microcontroller, Bluetooth module, Local Processing Unit and the transmission network all are consist in second layer. The LPU unit sends reading updates to the server periodically. This server maintains an action table based on received data and based on the action table it takes appropriate response based on the incoming sensor data. The server maintains the data in the data base in the third tier. At the time of contacting a person's send the analyze data with highlight the variation of parameter. Architecture of health monitoring shown in fig 2.1 which consist of two different node with sensing parameter such as BP and temperature.

A. Pulse Sensor

To measure the blood pressure which is pressure on wall of arteries when heart contract and relax BP sensor are used. The systolic is high blood pressure on wall of arteries when heart is contract and diastolic is low blood pressure when heart is relaxed. Use the correct cuff size for accurate reading. The Wireless Blood Pressure Monitor includes a Medium cuff. If cuff size is too large then it will produce a reading that is lower than the correct blood pressure and if cuff size is too small then it will produce a reading that is higher than the correct blood pressure.

B. Temperature Sensor (LM35)

The LM35 series are precision integrated circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in ° Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. The LM35 does not require any external calibration or trimming to provide typical accuracies of ±1/4°C at room temperature and ±3/4°C over a full −55 to +150°C temperature range.

C. Ardino Microcontroller

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

D. Bluetooth Module (HC-05)

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. The HC-05 Bluetooth Module can be used in a Master or Slave configuration, making it a great solution for wireless communication. This serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping Feature).

The second layer of this system explains the interaction between BSN, smart objects and LPU. Whenever the LPU detects any abnormalities then it immediately provides alert to the person who is wearing the bio-sensors. For example, in general BP More than 120 over 80 and less than 140 over90 is normal, when the BP of the person reaches above/below the normal range, the LPU will provide a gentle alert to the person through the LPU devices (e.g. beep tone in a mobile phone)and also send the details to concerned family member. If required this data can also be forwarded to the physician.

III. ALGORITHM

Step 1: Read the sensor output.

Step 2: Check the sensor output with the normal value.

Step 3: If the sensor output is normal nothing to do.

Step 4: If the sensor output is abnormal but not severe.

Step 4. a : Inform to family members and doctor.

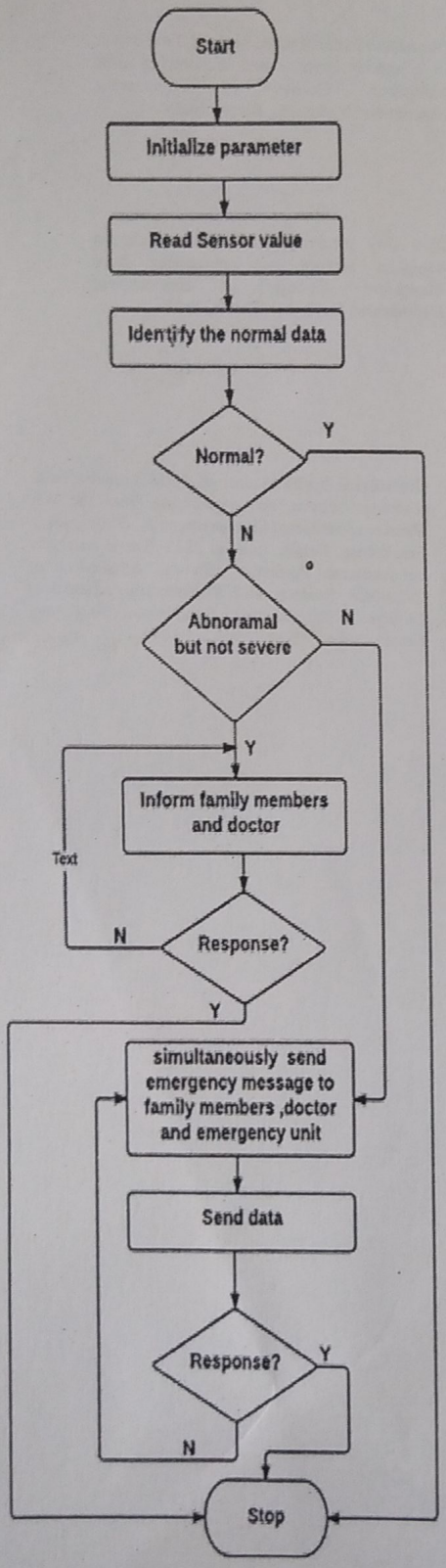
Step 5: If the sensor output is abnormal and severe.

Step 5. a : Inform to emergency unit, family members and doctor simultaneously.

Step 6: Send the data to all.

Step 7: If response from any one is not get repeatedly send the data to the person until get the response.

IV. FLOW CHART



V. EXPERIMENTAL RESULTS

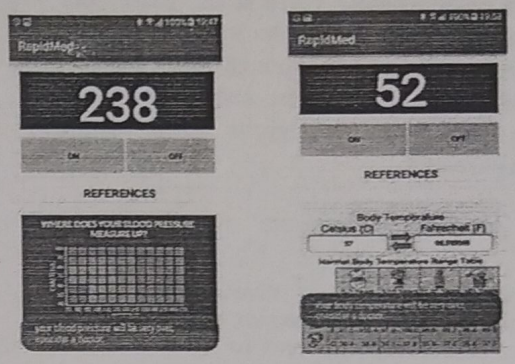


Fig 5.1 Result of remote health app

Figure 5.1 shows the heart rate of patients in remote health app. This data will be uploaded in data base in every interval of time. When an abnormality occur the SMS will be send to the family members, doctors and emergency unit in a particular interval until a respond will get back.

It is very suitable for real-time and effective requirements of the high speed data acquisition system in IoT environment. Different types of sensors can be used as long as they are connected to the system. Finally, by taking real time monitoring of health care monitoring in IoT environment as an example, the system is verified and achieved good effects in simulation output [11].

VI. FUTURE SCOPE

In our system the body parameters are measured using two sensors. In future we include more sensors for the body parameters measurements, to develop a health care application that is used to monitor the patients' deep brain stimulations, heart regulations and motions etc. When an emergency situation occurs the message will be provided automatically to the family members, doctors and emergency care unit in our system with the varying parameters. In future we consider the location and the history of patient, they are more helpful to the doctor to give good treatment to the patient [10].

In future, a health care application can be implemented, that provides all medical facilities.

VII. CONCLUSION

The security and emergency care issues in healthcare applications are described using body sensor network. All most all the popular BSN based research projects acknowledge the issue of the security and the privacy issues. Subsequently, we found that even though most of the popular BSN based research projects mention the issue of the security, but they fail to embed strong security services that could preserve patient privacy [8], [9]. And also we found that when an emergency situation occurs the care of each health care application is not efficient. Here we propose a secure IoT based healthcare system using BSN, called Rapid Med, which can efficiently accomplish various security

requirements such as Data Privacy, Data Integrity, Data Freshness and Anonymity of the BSN based healthcare system through two phases, registration phase and authentication phase. In registration, the Rapid Med server issues security credentials to a LPU through secure channel. The next authentication phase, where before provide the system services the user must be login to system using a username and a password.

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Ahammed Meeral pursuing the B.Tech degree in computer science and engineering from Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala, India.

Jinu Joy pursuing the B.Tech degree in computer science and engineering from Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala, India.

Gayathri R Krishna received the M.Tech degree in computer science and engineering from the Adi Shankara Instituteof Engineering and Technology, Ernakulam, Kerala, India in 2013. She is currently an Assistant Professor with the department of Computer Science and Engineering, Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala, India.

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Improving load balance in Wireless Network using Spatial Reusability

Vinodh P Vijayan[1*] ,Neena Joseph [2],Neema George [3],Simy Mary Kurian[4]

[1&3&4]Department of Computer Science & Engineering, Mangalam College of Engineering, Kottayam, India

e-mail: vinodh.pvijayan@mangalam.in, neena.joseph@mangalam.in, neema.george@mangalam.in, simy.kurian@mangalam.in]

*Corresponding Author: Vinodh.pvijayan@mangalam.in Tel.: +919961687007

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Abstract— The surest route from the supply node to the destination node that guarantees a high cease-to-stop throughput is the principle trouble of routing in multi-hop wireless network. As the surroundings is heterogeneous the issue seems to be a lot complicated, most of the answers cease with local most desirable due to the fact the ones algorithms often fail to make certain an quit to quit throughput. By considering spatial reusability of wireless media, the cease-to-give up throughput in wi-fi multi-hop far flung structures may be stronger hugely. To assist the argument, Spatial-reusability Aware Single-path Routing (SASR) algorithm is proposed and as compared with existing single direction routing protocol. The assessment showed that proposed protocol display full-size improvement in end-to-give up throughput in evaluation with existing protocols.

Keywords—WSN, througput, optimization.

I.

II. INTRODUCTION

Because of the confined limit of wireless conversation media, and lossy wi-fi connection [16], it's far vital to a exquisite degree to choose a path that augments the give up-to-quit throughput, especially in multi-hop wireless network. A precept problem with current wi-fi routing protocol is that proscribing the range of transmissions to convey a unmarried packet from source node to vacation spot node does not depend on augmenting the cease-to-quit throughput [4].

This paper examines routing protocol in single path routing. The intention of unmarried route routing is to pick out a value-proscribing route alongside which the packets are conveyed from the source node to vacation spot node. A big part of present protocols links fine aware routing. They just pick the course that limits the overall transmission count number or transmission time for transmitting the packet.

An crucial property of wi-fi verbal exchange media which differentiate it from stressed communique media is the spatial reusability. Wireless sign loses its energy via every hop [2]. Therefore, links can be used at identical time, in the event that they inside the some distance. But present protocols do not take this into attention.

III. RELATED WORK

In this location, a brief evaluation of associated work is accomplished. And also compare our work with these and briefly evaluate other works that do not forget reusability. There is diverse work on wireless routing metrics. For unmarried path routing a few hyperlink equality conscious measurements [1][6][7][9] are proposed. RTT [1] measured the value of the single wireless hyperlink through the spherical experience postpone of probe packets. ETX [6] allocated the link price with its everyday variety of transmission to efficaciously carry a packet. Based on ETX the writer in [9] mentioned ETOP metric considering the relationship real position at the manner. The early single direction routing protocols [3] [10] [17] [18] applied Dijikstra's algorithm for choosing a course. Some present day crosslayer processes mutually don't forget routing and also link scheduling eg [11] [19] [20], Zhang et al [20] distinct joint routing and planning into an enhancement trouble and tackled the issue with a phase age technique. Skillet et al [16] managed to the joint issue in subjective ratio structures considering the outlet of legal corporations.

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Optimization of delay and temperature for improved design flow in 3D IC

Simi P Thomas[1,*], Reshma Chandran[2], Neethan Elizabeth Abraham[3], Sunu Ann Thomas[4]

[1,2,3,4]Department of Electronics and Communication Engineering, Mangalam College of Engineering, Kerala, India

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Abstract: Thermal issue is a critical challenge in 3D IC design. To eliminate hotspots, physical layouts are always adjusted by shifting or duplicating hot blocks. However, these modifications may degrade the packing area as well as interconnect distribution greatly. In this paper, we propose some novel thermal-aware incremental changes to optimize these multiple objectives including thermal issue in 3D ICs. Furthermore, to avoid random incremental modification, which may be inefficient and need long runtime to converge, here potential gain is modeled for each candidate incremental change. Based on the potential gain, a novel thermal optimization flow to intelligently choose the best incremental operation is presented. We distinguish the thermal-aware incremental changes in three different categories: migrating computation, growing unit and moving hotspot. Mixed integer linear programming (MILP) models are devised according to these different incremental changes. Experimental results show that migrating computation, growing unit and moving hotspot can reduce max on-chip temperature by 7%, 13% and 15% respectively on MCNC/GSRC benchmarks. Still, experimental results also show that the thermal optimization flow can reduce max on-chip temperature by 14% compared to an existing 3D floorplan tool CBA, and achieve better area and total wirelength improvement than individual operations do.

I. INTRODUCTION

With the fast shrinking of device sizes, interconnect delays become the critical bottlenecks of chip performance. Three- dimensional (3D) integration, as figure 1 shows, recently has drawn much attention due to its potential for reducing the interconnect delay and complexity as well as promising high integration density.

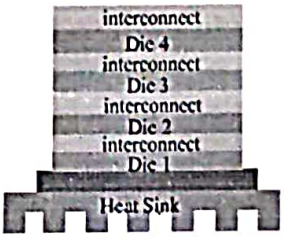

Figure 1 3D IC technology

Though 3D IC has many advantages, there are some significant challenges along with its adoption and further development. With multi-device layers design, the vertically stacked multiple layers of active devices cause a rapid increase of power density and the thermal conductivity of the dielectric layers inserted between devicelayers for insulation is quite low. Consequently, one extremely important issue in 3D IC design is the thermal problem resulting from both higher power density and lower thermal conductivity.

Recently, several works on thermal optimization during floorplanning for 3D ICs have been proposed [1, 2, 3, 4]. [1] proposed a thermal-driven floorplanning algorithm for 3D ICs. It uses a simulated annealing with an integrated compact thermal model. [2] proposed thermal-aware floorplanning for 3D microprocessors. The power consumption of interconnect is considered during floorplanning. Though the thermal-aware SA- based approaches can indeed distribute heat evenly across the chip to mitigate thermal issue, there is no guarantee to eliminate hotspot completely, sometimes hotspot still exists. To achieve much lower on-chip temperature, minor changes may require a start-over of the floorplanning process, which suffers from long runtime and poor performance scalability. Incremental floorplanning, however, could provide a novel approach: once a good result is obtained, extra thermal improvement can be achieved effectively by eliminating the hotspot incrementally rather than restarting a new general floorplanning.

In the meantime, for an existing floorplan, [5] points out that allocating more die area to blocks especially to hot functional units(growing unit) actually has an immediate

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Efficiency Improved DC-DC Boost Converter

Jeneesh Scaria[1*], Preethy Sebastian[2], Susan V Nanan[3]

[1,2,3]Department of Electrical and Electronic Engineering, Mangalam College of Engineering, Kerala, India

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Abstract— This paper proposes the design and simulation of a DC-DC Boost converter employing PID controller, enhancing overal performance of the system. The main objective of a DC- DC converter is to maintain a constant output voltage despite variations i input/source voltage, components and load current. Designers aim to achieve better conversion efficiency, minimized harmoni distortion and improved power factor while keeping size and cost of converter within acceptable range. A simple PID (Proportional Integral and Derivative) controller has been applied to a conventional Boost converter and tested in MATLAB-Simulink environmen achieving improved voltage regulation. The proposed closed loop implementation of the converter maintains constant output voltag despite changes in input voltage and significantly reduces overshoot thereby improving the efficiency of the converter. The output o this investigation has the potential to contribute in a significant way in electric vehicles, industry, communication and renewabl energy sectors.

Keywords— DC-DC converter; voltage regulation; Boost converter; overshoot; PID; Block Diagram Reduction; stability

I. INTRODUCTION

Power Electronics is ushering in a new kind of industrial revolution due to its versatility in terms of fields of application like energy conservation, renewable energy system, bulk utility energy storage, electric and hybrid vehicles and industrial automation. When it comes to power conversion, a DC-DC converter plays a significant role resulting in widespread applications in cellular phones, laptop computers, LED drivers, maximizing energy harvest for photovoltaic systems and for wind turbines, electric vehicles, hydro power plants and many more [1]-[4]. This widespread application requires that the converter should achieve highest efficiency, minimized total harmonic distortion (THD) and improved power factor (PF) at the load side while at the same time reducing size and cost of the device and increasing availability [5]-[8].

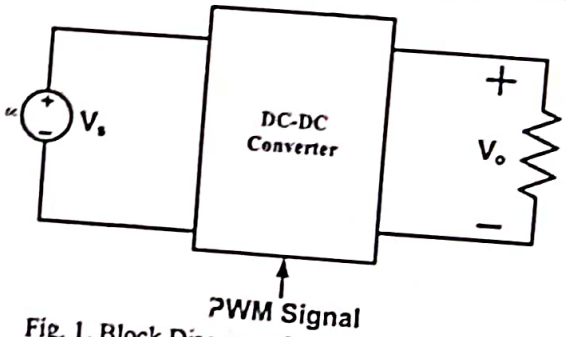

Fig. 1. Block Diagram of a DC-DC Converter

An electric power converter, DC-DC converter or more commonly known as a switched mode DC-DC converter as shown in Fig.1, either steps up or steps down the source voltage Vs according to the requirement of the load connected, by making adjustments in the duty cycle applied to the switching device (in most cases MOSFETs and IGBT's).

In a DC-DC converter it is always desirable that a constant output voltage, Vo is achieved despite changes in the source voltage, Vs the load current, iLoad and variations in element values of the converter circuit [10], [11]. These disturbances can be originated from second harmonic periodic variations of an off - line power system generated from the rectifier circuit and applied to the DC DC converter, variation of the source voltage Vs due to switching (on/off) of neighboring power system loads and variations in the

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Improved Random Area Selective Image Steganography with LSBMR

Neethan Elizabeth Abraham[1], Reshm Chandran [2], Jyothisree[3], Sunu Ann Thomas[4]

[1,2,3,4]Department of ECE, Mangalam College of Engineering, Kerala

Available online at: www.ijcseonline.org

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Abstract - Image steganography is the art of hiding secret message in grayscale or color images. Easy detection of secret message for any state-of-art image steganogra- phy can break the stego system. To prevent the breakdown of the stego system data is embedded in the selected area of an image which reduces the probability of detection. Most of the existing adaptive image steganography techniques achieve low embedding capacity. In this paper a high capacity Predictive Edge Adaptive image steganography technique is proposed where selective area of cover image is predicted using Modified Median Edge Detector (MMED) predictor to embed the binary payload (data). The cover image used to embed the payload is a grayscale image. Experimental results show that the proposed scheme achieves better embedding capacity with minimum level of distortion and higher level of security. The proposed scheme is compared with the existing image steganography schemes. Results show that the proposed scheme achieves better embedding rate with lower level of distortion.

Keywords - Edge adaptive . High level bit plane . Low level bit plane . Predictive image

1

2 Introduction

Image steganography is used to hide secret information within an image [4]. Two major approaches used are reversible and irreversible image steganography.

In reversible image steganography [1, 9, 12, 16, 17, 19, 23, 27, 28, 33] the cover image can be reconstructed accurately while extracting the payload from the stego image. The stego image is the image obtained after embedding the secret message in cover image. Most of the existing reversible image steganography schemes are very complex and achieve small em- bedding capacity [1, 13, 26, 27]. Embedding capacity can be increased by adaptive embedding of payload near sharper edges. More bits can be accommodated in sharper edges using adaptive selection.

Irreversible image steganography schemes achieve higher embedding capacity with minimum computation time. Detection of hidden information in stego image resulting from irreversible stego system is straightforward. Many steganalytic schemes [7, 10, 14] have been proposed in literature, which can accurately detect the presence of secret information embedded using irreversible image steganography. These methods are prone to easy detection of the embedded information. Even though irreversible image steganography schemes achieve low computation time, low level of security degrades the performance of such system. Encryption of secret information could be one of the solutions. However, inclusion of encryption spoils the use of steganography as the fundamental need of image steganography is to eradicate the suspicion of hidden data.

In this paper an adaptive image steganography technique which bears high embedding rate is proposed. Adaptive nature of the embedding process increases the embedding rate without increasing the detectability. Binary payload is embedded in edge area of a grayscale cover image. Grayscales of the cover image are used to embed binary payload in selected area based on some threshold which determines the number of bits to be embedded.

3 Related work

There are many reversible image steganography schemes proposed in the literature which employ encryption to achieve higher level of security. Wu et al. proposed a reversible image steganography scheme [32], where the secret message is encrypted using either AES or DES. The

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Automatic Field Irrigation System

Preethy Sebastian[1]*, Susan V Nainan[2], Jeneesh Scaria[3]

[1,2,3]Department of EEE, KTU Unversity, Kottayam, Kerala, India

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Abstract: Agriculture needs 85% of the available freshwater and its requirement may increase in fu- ture. Hence, a system is needed to utilize water e ciently in agriculture. The modern drip irrigation system lessens a significant amount of water usage compared to the traditional methods. And some crops need variable amounts of water as it grow e.g. paddy. This paper proposes an automation of drip irrigation in which the smartphone initially captures soil image, calculates its wetness level and transmits the data onto the microcontroller through GSM module intermittently. The microcontroller decides the irrigation and sends the sta- tus of the field to the Farmer's mobile phone. The system is tested for paddy field for over a period of three months. It is observed from the experimental setup, that it saves nearly 41.5% and 13% of water compared to the conventional flood and drip irrigation methods respectively.

Keywords: Android application, Drip irrigation, GSM module, Microcontroller

1.

2. Introduction

Water is a common and most abundant substance on the earth which is occurring naturally in the form of inorganic liquid. Agriculture is the most predominant activity in developing countries for food and other essential things used by living organisms to sustain and enhance their life. Agriculture uses 85% of available freshwater resources worldwide for cultivating the plants using traditional irrigation methods and it increases the demand for the water resources in day-to-day life as the population grows [1]. Tamilnadu has three distinct monsoons such as southwest, northeast and dry season and are prone to droughts. It is felt necessary to have a smart system for the e cient utilization of the available water. Farmers are also very much eager in adapting to the novel ideas and market forces. It is evaluated that agricultural yield has to reach 70% by 2050. The automation definitely brings out a remarkable achievement in future. In Tamilnadu, paddy constitutes 85.2% of total food grain production and it requires varying quantity of water at different growth stages. Flood irrigation is a technique that releases water until the entire field is covered, but the crop does not need that much amount of water during its entire growth span (i.e.) it requires only 50% and 25% of water in mid and early stages of cultivation compared to the fully grown stage. Hence drip irrigation is chosen to optimize the usage of water resources for improving the crop yield. The drip irrigation system is also known as micro irrigation which supplies water either directly to the root zone or soil surface through pressurized pipes, valves and drippers to make water drip slowly. Drip Irrigation system saves nearly 40–80% of water compared to traditional flood irrigation method. A general layout of drip irrigation system [2] is shown in Fig. 1 and drip irrigation based paddy cultivation [3] is shown in Fig. 2. An integrated site-specific irrigation controller with infield data feedback was proposed in [5], which assists in making the irrigation decisions and real time monitoring of irrigation tasks through Bluetooth communication. A low cost micro-controller prototype system wes designed to monitor the soil, canopy, air temperature, and soil moisture status of the crop fields using appropriate sensors.

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Improved of Stair Climbing Wheelchair for Differently Abled People

Arun Jose[1*], Leneesh N Gopal[2], Jishnu M[3], Harikrishnan A R[4]

[1,2,3,4]Department of Mechanical Engineering, Mangalam College of Engineering, Kerala, India.

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Abstract: This paper presents a new version of Wheelchair.q, a wheelchair with stair climbing ability. The wheelchair is able to climb single obstacles or staircases thanks to a hybrid wheel- leg locomotion unit with a triple-wheels cluster architecture. The new concept presented in this work represents an improvement respect to previous versions. Through a differ- ent arrangement of functional elements, the wheelchair performances in terms of stability and regularity during movement on stair have been increased. In particular, attention has been paid to ensure a regular and comfortable motion for the user during stair climbing operation. For this reason, a cam mechanism has been introduced and designed with the aim to compensate the oscillation generated on the wheelchair frame by the locomotion unit rotation. A design methodology for the cam profile is presented. Moreover, a para- metric analysis on the cam profile and on the mechanism dimensions has been conducted with the aim to find a cam profile with suitable dimensions and performances in terms of pressure angle and radius of curvature.

Keywords: Stair-climbing wheelchair, Triple-wheels, Cam mechanism, Mechanism design, Architectural barriers

1.

2. Introduction

Nowadays, architectural barriers represent an unsolved problem for disable or people with reduced mobility. According to [1] there are around 1.2 million wheelchair users in the UK, roughly 2% of UK population. As regard U.S.A. population, about 3.3 million people (1.4%) use a wheelchair or similar devices and 10.2 million (4.4 %) use a cane, crutches, or walker [2]. Only 28% of wheelchair users are under 60. Disability is strongly related to age: 2.1% of 16–19 year olds; 31% of 50– 59 years; 78% of people aged 85 or over [1]. This means that the number of wheelchair users will increase according to the aging society, thus the architectural barriers problem will become even more important. Moreover, the most common barriers to access buildings for adults with impairments are related to physical obstacles [3]. From these data, it is evident that providing autonomy to disabled people is an unsolved challenge.

Problems related to architectural barriers can be faced in two ways. From one side, governments try to introduce stan- dards in order to remove architectural barriers from buildings. From the other side, disable people can be provided with devices able to climb obstacles when architectural barriers cannot be removed for technical or economic reasons.

Some commercial stair-climbing devices already exist but most of them are complex, bulky, heavy, expensive and/or they require a great number of sensors and actuators. Thus, in the research field, several architectures have been proposed with the aim of improving the performances of existing stair-climbing wheelchairs in terms of e ciency, simplicity and stair climbing effectiveness. Stair-climbing mechanisms for wheelchair can be classified according to [4] in the same way as obstacle climbing mobile robots: wheel, leg, track and their hybrid combinations.

Finally, another typology of locomotion system is represented by wheel clusters. In [18,19], a two-wheels cluster mech- anism is presented. This architecture is not statically stable but should be balanced through a stability controller based on an inverse pendulum model. The high control requirements necessary to maintain the dynamic stability and safety issues are the main drawbacks of this kind of solution. In [20,21] a two-wheels cluster solution is presented. In these cases, the static stability is guaranteed by the introduction of additional articulated mechanisms.

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Low power Single Bit Full Adder Using GDI and PTL Technique

Anu Philip[1,*], Reshma Chandran[2], Simi P Thomas[3]

[1,2,3]Department of ECE, Mangalam College of Engineering, Ettumanoor, Kottayam, India

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ABSTRACT - Full adder circuit is functional building block of microprocessors, digital signal processors or any ALUs. In this paper leakage power is reduced by using less number of transistors with the techniques like GDI (Gate Diffusion Input) and PTL (Pass Transistor Logic) techniques. In this paper 3 designs have been proposed of low power 1 bit full adder circuit with 10Transistors(using PTL multiplexer) , 8 Transistor(by using NMOS and PMOS PTL devices), 12 Transistors (6 Transistors to generate carry using GDI technique and 6 Transistors to generate sum using tri state inverters).These circuits consume less power with maximum of 73% power saving com-pare to conventional 28T design. The proposed circuit exploits the advantage of GDI technique and pass transistor logic, and sum is generated by tri state inverter logic in all designs.The entire simulations have been done on 180nm single n-well CMOS bulk technology, in virtuoso platform of cadence tool with the supply voltage 1.8V and frequency of 100MHz.

KEYWORDS - leakage power, GDI, Pass transistor logic, tri-state inverters.

1.

2. INTRODUCTION

As the applications requiring low power and high performance circuits increasing, this has intensified the research effort in low power microelectronics. Full adder circuit is functional building block and most critical component of complex arithmetic circuits like microprocessors, digital signal processors or any ALUs [1]. Almost every complex computational circuit require full adder circuitry.

The entire computational block power consumption can be reduced by implementing low power techniques on full adder circuitry. Several full adder circuits have been proposed targeting on design accents such as power, delay and area. Among those designs with less transistor count using pass transistor logic have been widely used to reduce power consumption [2-4]. In spite of the circuit simplicity, these designs suffer from severe output signal degradation and cannot sustain low voltage operations [5].

In these designs we have exploited the advantages of GDI technique and PTL technique for low power. In these designs, we have generated carry using GDI technique, we have generated carry using PMOS and NMOS pass transistors and also by using modified multiplexer using pass transistors. The motivation is to use the tri-state inverter instead of inverter as it reduces power consumption by 80% when compare to normal inverter. And sum is generated using 6T XOR module as shown in Fig.7.The rest of the paper is organised as previous research work, proposed full adder designs, simulations-results-comparison and conclusion.

3. PREVIOUS WORK

Many full adder designs have been reported using static and dynamic styles in papers [1-4]. These designs can be divided into two types, the CMOS logic and the pass-transistor logic [5]. Different full adder topologies have been proposed using standard XOR and XNOR circuits and with 3T XOR-XNOR modules.

In [5] a low power full adder cell has been proposed, each of its XOR and XNOR gates has 3 transistors. Advantages of pass-transistor logic and domino logic encouraged researchers to design full adder cell using these concepts [6] [7]. Full adder cells based on Sense energy recovery full adder (SERF) [8] and Gate diffusion input (GDI) techniques [5] are common. To attain low power and high speed in full adder circuits, pseudo-NMOS style with inverters has been used [9]. A 10 transistors full adder using top-down approach [10] and hybrid full adder [11]are the other structures of full adder cells. Sub threshold 1-Bit full adder cell and hybrid CMOS design style are the other techniques that targeted on fast carry generation and low PDP.

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Irregular Building Analysis

Sipli Abraham[1,*], Salini Theres N Kurian[2], Nissy Sussan Mani[3], Aswathi S[4], Sreerenj Ragav[5]

[1,2,3,4,5]Department of Civil Engineering, Mangalam College of Engineering, Ettumanoor Kottayam, India

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Abstract - Preliminary seismic risk assessment tools are used to screen existing buildings against potential seismic hazards. Buildings tha perform poorly are prioritized for detailed evaluations to determine its condition. The risk of a building can be defined as the product c Hazard, Vulnerability, and Assets. Hazard is the earthquake itself. Vulnerability are building characteristics that make it more susceptibl to the hazard. Assets are elements that add value to the structure such as building population. Vertical irregularities such as soft stories ar considered in assessments but is much generalized. The National Structural Code of the Philippines (NSCP) defines soft story irregularitie based on the reduction of stiffness in adjacent stories. Since the study is used for an ocular preliminary risk assessment of existin buildings, the soft story definition is simplified. In the study, it is assumed that the properties and number of structural members for eac story is constant. Thus, soft stories may be defined by simply determining the height of the stories. The study is also limited to a single so story at the first story. The severity of the soft story is varied by increasing the height of the soft story. A static pushover analysis is utilize to determine the performance of the building under different irregularity conditions. The output of the study may be used to improv existing level 1 seismic risk assessments. Due to the limitations of a static pushover analysis, the study only covers low-rise buildings a permitted by the NSCP. Though it is recognized that a dynamic time history is more suitable, a pushover analysis is sufficient due to th preliminary assessment nature of the objective. The study has found that one of the primary concerns in vertical irregularities is th localization of seismic demand. For soft story buildings, the concentration of seismic demand is where the soft story is located. Data fro the pushover analysis is translated into score modifiers for the varying soft story severity which may be used for preliminary ris assessment tools.

1.

2. Introduction

Earthquakes are considered to be one of the most unpredictable and devastating natural hazards. Earthquakes pose multiple hazards to a community, potentially inflicting large economic, property, and population loss. One of the measures used in order to combat or reduce the devastating effects of earthquakes is through the seismic risk assessment of existing buildings.

Several procedures have been developed in order to allow communities to prevent and mitigate losses in the event of an earthquake. One such technique is assessing existing buildings to determine which buildings are safer if an earthquake is to occur. However, the amount of structures is too large and would take a significant amount of time and resources to be assessed in detail. A preliminary assessment is then introduced in order to determine which buildings should be prioritized for a detailed assessment. One such tool is the American tool FEMA154 by the Applied Technology Council and Federal Emergency Management Agency (ATC 2002) [1]. It should be emphasized that preliminary assessment procedures are merely tools for prioritization and cannot actually determine if a building is definitely safe from earthquakes.

The FEMA154 have become the model for a number of rapi visual screening tools of several countries. Canada, India, Ne Zealand, and several others, followed the framework c FEMA154, developing their own rapid visual screening tool fc potential seismic hazards to suite local structural codes an conditions.

In preliminary seismic risk assessments, there are sever parameters considered such as the soil type, seismic zonin structural system, material type, height, irregularities, and et These assessment tools are widely used throughout differer countries and accepted as an effective tool for risk assessmen Still, improvements to the assessment tool can still be introduce which allows it to be more refined. One such improvement th can be introduced is in the area of vertical irregularities. Vertic irregularities are basically building characteristics that demand for more complex design due to the different seismic deman experienced. An example of a vertical irregularity are building with soft stories. This can be further broken down into th different types of irregularities as well as their severity for more refined assessment tool.

2.1. Pushover Analysis

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Solar Bicycle

Susan V Nanan[1,*], Jeneesh Scaria[2], Preethy Sebastian[3]

[1,2,3]Department of EEE, Mangalam College of Engineering, Ettumanoor Kottayam, India

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Abstract — As we all know the fuel prices especially the petrol is rising steadily day by day. Again the pollution due to vehicles in metro cities & urban areas is increasing continuously. To overcome these problems, an effort is being made to search some other alternative sources of energy for the vehicles. Again, it is also not affordable to purchase vehicles (mopeds, scooters or motorcycles) for all the class of society. Keeping this in mind, a search for some way to cater these economically poor people as well as to provide a solution for the environmental pollution was in progress. The solar assisted bicycle developed is driven by DC motor fitted in front or rear axle housing & operated by solar energy. The solar panels mounted on the carriage will charge the battery & which in turn drive the hub motor. When the bicycle is idle, the solar panel will charge the battery. This arrangement will replace the petrol engine, the gear box & the fuel tank in case of a two wheeler or a chain sprocket, chain & gear shifting arrangement of conventional bicycle being used by most common man. As a part of dissertation work, the solar assisted bicycle is fitted with a dc hub motor on front axle of a bicycle with power rating of 250W and with a travelling speed of around 25-30 kmph. It is provided with a pair of lead acid batteries of 35 Ah each, a photovoltaic solar panel with capacity of 20 watt, a voltage regulator of 24v 10 Amp, accelerator and motor controller of 24v 25Amp. There is also a provision for charging of the battery with 220-240V, AC wall outlet supply, in case of poor solar supply due to cloudy weather.

Index Terms - Solar Assisted Bicycle (SAB), Hub Motor, SolarPanel, Motor Controller, Voltage Regulator.

I Introduction

The solor assisted bicycle consist of following components (fig.1) – hub motor, solar panel, voltage regulator, lead acid battery, motor controller, accelerator, bicycle.

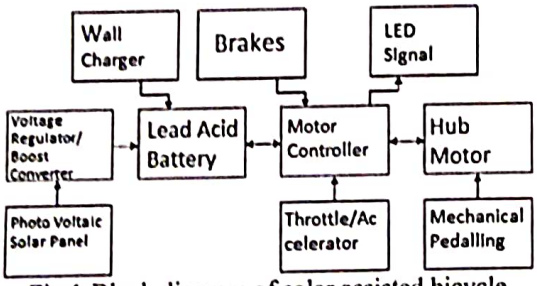

Fig 1-Block diagram of solar assisted bicycle

A. Hub Motor

The hub motor is a conventional Dc motor. The rotor (Fig.2) is outside the stator with the permanent magnets mounted on inside. The stator (Fig.3) is mounted and fixed onto the axle and the hub will be made to rotate by alternating currents supplied through batteries. Hub motor generates high torque at low speed, which is highly efficient and which doesn't need sprockets, brackets and drive chains. This means they are very reliable and have a long life. The main characteristic of Brushless DC Machines is that they may be controlled to give wide constant power speed ranges.[10][11][12]

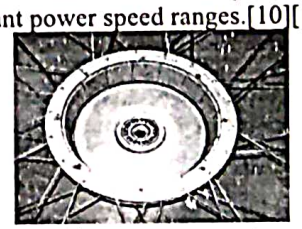

Fig 2: Hub Motor Rotor

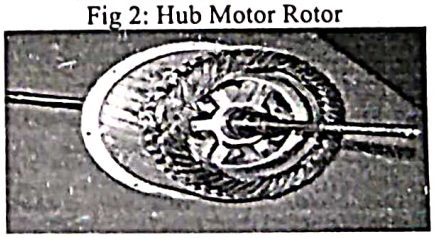

Fig 3:Hub Motor stator

Table 1: Specifications of Hub Motor

Type of Motor	Hub motor
Design of Motor	BLDC

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Six sigma DMAIC approach in a modern rubber factory

Leneesh N Gopal[1*], Harikrishnan[2], Arun Jose[3], Jishnu[4]

[1,2,3,4]Department of Mechanical Engineering, Mangalam College of Engineering, Ettumanoor Kottayam, India

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Abstract – The objective of this paper is to present a review of six sigma DMAIC Methodology (D-Define, M-Measure, A-Analyses, I- Improve and C-Control). The papers containing DMAIC in their titles were collected and studied during this literature review. The results of the studies reported in this paper have confirmed that DMAIC is a compatible model for the benefit of the Six Sigma concepts in the manufacturing sector. In this background, this paper has been concluded by suggesting future research to examine the application ofDMAIC in many areas.

Key Words: Six Sigma, DMAIC, DMADV, DPMO

1.

2. INTRODUCTION

Modern organizations are trying hard to improve their overall performance to face the ever increasing intensity of competition. While carrying out this task, modern organizations have been striving to apply appropriate strategies in all of their endeavors. One of the strategies that have been finding wide and deep applications in modern organizations is "continuous quality improvement" with the reduce cost, defects and cycle time. By adopting this strategy, modern manufacturing organizations have been striving to improve quality continuously in their endeavors by adopting competitive strategies. One of these competitive strategies is 'Total Quality Management' (TQM). After the emergence of TQM principles in the world, the manufacturing organizations began to adopt tools, techniques and systems to achieve continuous quality improvement. Some of them include 'Cause and Effect Diagram', 'Kaizen', 'Quality Function Deployment' (QFD) and 'ISO 9000' series based quality management systems.

Time and again, researchers and practitioners have reported that these TQM tools, techniques and systems have facilitated manufacturing organizations to achieve "continuous quality improvement". Yet, some practitioners and researchers began to find out that the implementation of TQM principles, tools, techniques and systems often failed to aid the manufacturing organizations towards achieving high profitability. Hence, the practitioners began to realize the need for a TQM model that would facilitate the manufacturing organizations to achieve profitability. As a result of this realization, Six Sigma concept emergedin Motorola in the late 1980.

Six Sigma is the methodology to achieve customer delight by reducing number of defects and cycle time to a level of 3.4 defects per million opportunities in products processesand service and thereby reducing

- Productivity improvement
- Market-share growth
- Customer retention
- Cycle-time reduction
- Defect reduction
- Culture change
- Product/service development

Sigma is a letter in the Greek alphabet which is used to designate the distribution or spread about the mean of any process or procedure. In other words, sigma may be described as the number of standard deviations we can fit between the mean and the nearest specification or measure of the number of defects per opportunity produced by a process.Sigma level is a statistic used to describe the performance of a process to the specification limits. It is the number of standard deviations from the specification limits to the mean of the process.

3. SIX SIGMA METHODOLOGIES

There are two major methodologies used within Six Sigma,both of which are composed of five sections.

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Time Table Scheduling Using Genetic Algorithm

Vinodh P Vijayan[1],Neena Joseph[2],Neena George[3],Simy Mary Kurian[4]

[1]Department of CSE, MangalamCampus, Ettumanoor, Kottayam ,India
[2]Department of CSE, Mangalam Campus, Ettumanoor, Kottayam ,India,
[3]Department of CSE, Mangalam Campus, Ettumanoor, Kottayam ,India,
[4]Department of CSE, Mangalam Campus, Ettumanoor, Kottayam ,India,

e-mail: vinodhpvijayan@yahoo.com,neena.joseph@mangalam.in, neena.george@mangalam.in,simy.kurian@mangalam.in

Corresponding Author: vinodhpvijayan@yahoo.com, Tel.: 9961687007

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Abstract— Scheduling the class intervals using traditional methods like using on line spreadsheets is complicated and time consuming. The complexity will increase with more than one concern, pupil and teachers because the requirements become extra complex. It is tough to manage topics with multiple instructors or forming student businesses and assigning instructors. In addition, priority of topics or instructors, class hours are not taken into consideration for scheduling. Class scheduling using genetic algorithm, has been advanced to time table class rooms thinking about various resources and parameters. The proposed algorithm accepts diverse parameters like priority values for teachers and topics or elegance hours and give the satisfactory solution. Our new device makes the school room scheduling less difficult and also reduce the time required for scheduling.

Keywords— Scheduling,ComplexityIOT,fuzzylogic,genetic algorithm.

I. INTRODUCTION

Classroom scheduling changed into the maximum tedious and time-consuming process in every faculties and schools. Even though, there are software's to be had for scheduling, it does no longer meet many necessities needed by using faculties and colleges. Existing software program's assist to agenda class room through assigning subjects to instructors and instructors to magnificence room. But it's miles impossible to get information about total hours assigned or to compare and analyze the work hours assigned with in a length.

Therefore, we propose a genetic algorithm for scheduling class rooms which reduces the complexity of the scheduling method. With the help of new device, the user can agenda classes, view and edit current schedule. The genetic set of rules accepts a couple of parameters, practice genetic operators to the parameters to discover the best solution for the scheduling trouble.

I.

The algorithm takes numerous sources as enter parameters and find exceptional score value for each populace taken from input parameters. The population with the excellent rating offers the most suitable solution for scheduling.

II. LITERATURE SURVEY

Genetic algorithms are search algorithms primarily based on the mechanisms of natural choice and natural genetics [1]. Genetic algorithms are used for solving problems because of its ability to search for greatest solutions in large seek area [2]. In GA, it requires the natural set of parameters of optimization hassle to be coded as a finite string length chromosome representation consisting of binary, real-coded, integer and permutation representation. Some operations ought to do in genetic set of rules such as initialization, reproduction, evaluation and selection.

During initialization, some random solution is generated and store in population. The population itself is a collection of solutions and it will be forwarded for the next iteration. Reproduction is producing some other solutions through

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DRIP IRRIGATION & MONITORING BASED ON SMART IRRIGATION

Sanu Ann Thomas[1], Neethan Elizabeth Abraham[1], Reshma Chandran[1], Anu Philip[1]

[1,2,3]Department of ECE, Mangalam College of Engineering, Ettumanoor, Kottayam India

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Abstract—Water is an essential component for the developmentof plants in agriculture or irrigation. The paper stresses on the need of an externally hosted cloud computing platform to manage the database, android and the isolated server by the users across the country for irrigation. The system proposed in this paper uses information and communication technologies, allowing the user to consider and examine the information obtained by different sensors. Here we are using different sensors like humidity, temperature, moisture, light etc. These sensors give signal to the micro controller. Micro-controller gives the data to the isolated server through a serial communication. According to sensor values graph will be display on PC and Smart phone side and by using this graph user can on or off drip devices. In this we keep threshold value for each sensor. The data is sent and processed on an isolated server, which stores the information from the sensors in a database, allowing further interpretation of data in a simple and flexible way. The intended system may lead to enhance the farming practices, overcoming the water crises and developing an upgraded agricultural system for the country.

Keywords—Cloud, Embedded, Android, Remote Monitoring, Wireless Sensor Network

I. INTRODUCTION

Agriculture has been the spine of the Indian economy and it will continue to remain for the long time. Over 70 per cent of the rural households depend on agriculture. One-third of our National income comes from agriculture. The economic improved, started off in the country during the early 1990s, have put the economy on a higher growth rate trajectory. Annual growth rate in gross domestic product (GDP) has accelerated about 25%. Indian agriculture has registered impressive growth over last few decades. The growth inagricultural production has been still for the past several years. The significance of agriculture is: 1) Contribution to National Income, 2) Main source of Food, 3) Agriculture and Industrial development, 4) Sources of Revenue, 5) Source of Foreign trade. 6) Transport, 7) Source of saving, 8) Capital formation, 9) International importance, 10) Way of life, 11)Effect on prices, 12) Source of labor supply, 13) Economic development. Our land was losing its fertility being put tocultivation continuously for years together. So we have readall the existing system and their working and we have found out that there is no system that uses the micro-controller,cloud, data mining and smart phone all together. So we are combining all the existing system to get the hybrid system. Sensor-Based irrigation system has been studied in much application. These sensors send real time values to microcontroller and microcontroller send these values to PC via serial communication [1]. The system suggests an economical and easy-to-use Arduino-based automated irrigation system that utilizes the Android smart phone for remote control. The data received by the Android smart phone from the Arduino is displayed on the User Interface [2]. The volumetric data of water utilized and crop yield were collected and the results showed that the water consumption is reduced in the automated field as compared to the manually irrigated field [3].

II. LITERATURE REVIEW

In this paper drip irrigation control using mobile phone. They use different sensors like humidity, temperature, light etc. for detection purpose. The sensor sends real time value to microcontroller send to pc via serial communication. In this system central monitoring is computer and remote monitoring is mobile phone and mobile send command via network and android application to PC. Then PC will ON or OFF device. They use Hardware like ADC0808, IC89C51IC Microcontroller, MAX 232 for serial

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IoT based Waste Disposal

Sunu Ann Thomas[1*], Neethan Elizabeth Abraham[2], Resma Chandran[3], Jyothysree K R[4]

Department of ECE, Mangalam College of Engineering, Ettumanoor Kottayam, India

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Abstract—Dustbins are containers used for collecting household waste all around the world. In our day-to-day life, we dispose variety of waste materials categorized as industrial waste, sewage wastes, domestic wastes etc. Dustbins are used for collecting the domestic waste materials. Indoor dustbins are used to collect wastes from household, which are then disposed into the outdoor dustbins maintained by the Corporation or Municipality. Indoor dustbins are smaller in size, whereas municipal dustbins present outdoors are so big in size since it has to accommodate all the wastes from many household users in that area. Hence our main focus is on the dustbins placed outside every corner in the streets in order to keep the environment clean. Road side dustbins are not monitored and cleaned properly most of the times. In this paper we propose a new system for managing garbage within Smart Cities. This Efficient Waste disposal or Management System is considered as an essential for Modern Smart Cities (MSC). Internet of Things (IoT) can be implemented both in IS and MSC creating an highly developed proposal for future Operations. Special methods can be applied to enhance technology used for high Quality of Service (QoS) in our waste management system. Specifically, IoT components like sensors, detectors, and actuators are integrated into Intelligent System (IS) and Inspection systems for efficient waste management. We recommend a sophisticated IS for efficient waste management in Smart Cities. The proposed system is an automated alert based smart bin or garbage collection system and to alert the authorities like corporation or local waste disposal team. Using this, we can monitor the complete waste disposal in an efficient way.

Keywords — Smart cities, Smart bin IOT Sensors, UV infra-red automated, Aurdino UNO, Ethernet module, alert buzzer, cost efficient, Rain detector, Ethernet, Html web page.

I INTRODUCTION

Recent advancements in communication technology using wireless sensor devices opened vast opportunities for developers and researchers of many intelligent smart systems developed for social relevant applications. Using this everyone is migrating to select only smart mobile phones, smart sensors, smart home automation, smart irrigation system etc. The IoT permits all individuals and things to be more smart and connected to the Internet world. Hence, we can call it as Internet of Everything. To facilitate new smart services and redesign the active devices in smart cities are very effective, when we use IoT [1-6]. In this case garbage collection is reshaped to Waste Collection as a Service. Dynamic scheduling and collecting waste are the manual process, but done efficiently through online using IoT. There are two Issues connected to smart waste collection. First how frequently collect waste from bins and secondly how to inform this to the municipal authorities.

Smart Bin, is a garbage collecting dust bin,which is self-aware and detects the level of the waste in the dustbin, based on that it can send alert messages to the municipal authorities, so the authorities make the arrangements to replace the dustbin. This type of dustbins will be very useful in places where the frequency of people using the dustbin varies because timely checks won't be sufficient [7]. Other features are also added, one is automated closing of the doors with the help of motors using Ultra-sonic Sensor, in case the dustbin is full, another is the detection of objects around the dustbin using IR Sensor, which in turn can help the dustbin from accumulating wastes around the dustbin. An Arduino board is used to send the information to a server. Power supply of 12V-2 Amps is used for the circuit. An IR Sensor is used for detecting objects and an ultra-sonic Sensor is used for detecting the height filled by the dustbin.[8] These Sensors are connected to the SPI Interface of the Arduino, and a buzzer is added with relays. Buzzer is used as an alarm in case people throw wastes around the dustbin. The board also consists of a voltage regulator, which is used to provide the required voltage to the Sensors and the Arduino. [9]. The Arduino consists of an Ethernet module, which is used for server client communication. Using this, information can be passed from

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EFFICIENT TRANSFORMERLESS BOOST CONVERTER

Jeneesh Scaria[1], Preethi Sebastian[2], Susan V Nainan[3]

[1,2,3]Department of EEE, Mangalam College of Engineering, Ettumanoor, Kottayam

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Abstract: This article proposes a new high-gain transformerless dc/dc boost converter. Although they possess the ability to boost voltage at higher voltage levels, converter switching devices are under low voltage stress. The voltage stress on active switching devices is lower than the output voltage. Therefore, low-rated components are used to implement the converter. The proposed converter can be considered as a promising candidate for PV microconverter applications, where high voltage-gain is required. The principle of operation and the steady-state analysis of the converter in the continuous conduction mode are presented. A hardware prototype for the converter is implemented in the laboratory to prove the concept of operation.

Keywords: High gain dc/dc converter; low voltage stress; photovoltaic (PV)

1. Introduction

Currently, dc/dc converters are used in most industrial applications. However, for photovoltaic (PV) energy systems, a step-up dc/dc boost converter is mandatory to boost the low voltage to higher level to enable grid integration or supply power to an islanded load, see Figure 1. In most of the practical cases, the converter is configured to generate output voltage around 400 V, with input voltage only ranging from 18 to 50 V [1–4].

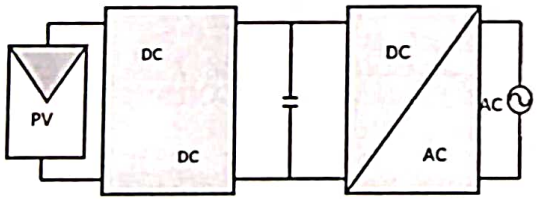

Figure 1. Two stage PV microinverter.

In ideal scenarios, the voltage gain of the classical boost converter is infinite. However, practically, its step-up ability is limited and restricted by the power device's parasitic components, capacitance and inductance, and conduction losses caused by resistances and diode voltage drops. Another limitation for having such a high step-up ratio is that triggering the power switch during the high duty cycle may causes reverse recovery problems and magnetic saturation issues [5–8]. Several papers have been published in the literature, attempting to create boost converters with high gain and high efficiency [9–17]. Step-up dc/dc converters can be classified based on the inclusion of a transformer that is isolated vs. non-isolated. Topologies that include a transformer can provide high voltage- gain by controlling the turns ratio of the transformer. Moreover, transformers provide isolation between the output and input sides. Transformerless topologies are competitive in terms of cost, weight, and design simplicity [15]. Topology presented in [17], which is based on cascading boost converters, is able to achieve higher voltage gain without an extreme duty cycle as compared to the classical boost converter; however, its switching devices are under high voltage/current stress. Another possible solution for providing a higher voltage gain is the use of switched inductors/capacitors [18–22]. A switched inductor converter has a voltage gain double of that reported for the classical boost converter; however, its semiconductors are under high voltage stress.In some papers, voltage lift methodology is applied [23–25] in order to achieve high voltage-gain, as well as reduce voltage/current stress on the switches. However, multiple diodes and capacitors are required when the conversion ratio is high. Isolated topologies, such as coupled inductors and flyback converters, use the turns ratio, in addition to the duty cycle, to control the converter voltage gain. As the required step-up ratio is

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Smart Ambulance Traffic Control System

Anu Philip[1], Simi P Thomas[2], Neethan Elizabeth Abraham[3], Reshma Chandran[4]

[1,2,3,4]Department of ECE, Mangalam College of Engineering, Ettumanoor, Kottayam

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Abstract – The growth of industrialization and urbanization has lead to an immense increase in the population invariably leading to rise in the number of vehicles on road. The resulting traffic congestion and traffic jams are the major hurdles for emergency vehicles such as ambulance carrying critical patients as these emergency vehicles are not able to reach their destination in time, resulting into a loss of human life. To solve this problem to some extent we have apparently come up with Intelligent Traffic Control System(TCS) for ambulance". The proposed system clears the traffic congestion by turning all the red lights to green on the path of the ambulance, hence helping in clearing the traffic and providing way towards its destination. The system consists of an android application which registers the ambulance on its network. In case of emergency situation, if the ambulance halts on its way, the application sends an emergency command to the traffic signal server and also the direction where it wants to travel along with this the current position with the help of Global Positioning System (GPS). The nearest signal is identified based upon the current position of the ambulance. And that particular signal is made green till the ambulance passes by and later it regains its original flow of control. In this way it acts like a lifesaver project as it saves time during emergency by controlling the traffic lights.

Key Words: Server, Mobile app, Arduino, LCD Display, GPS Tracking System.

2. INTRODUCTION

The pace at which the world is developing is very high today. Reformations in technology every day is evolving and improving efficiency in healthcare sector is one of the most difficult and challenging jobs also with the advent of Industrialization and Urbanization, as the population increases day by day the number of vehicles also increases on the roads. This leads to high traffic jams in big cities. Traffic congestion causes many adversary effects on countries transportation. One of the widely affected service due to traffic jams is that of an ambulance. Many a times, ambulance consist of emergency or critical patients which needs to be taken to the hospital in minimum amount of time providing proper treatment to the patient so that chances of surviving increases in critical condition. A Patient may lose his life if there is delay in reaching of ambulance to the hospital. According to the surveys 95% of the heart attacks cases can be treated, if the ambulance can reach the hospital at current time without strucking into the traffic. For this, it is needed that the vehicles on the road to make way for the ambulance. But sometimes, the ambulance gets stuck in the traffic which in turn wastes a lot of time waiting for the traffic to get clear. We can overcome these limitations by the emerging technology such as IoT i.e. Internet of Things. Various software implementations and hardware devices can be connected with the help of wireless networking tools or wired tools. In IoT the components are connected and controlled by the internet. Thus the impact of IoT in today's era is significant as it helps to represent the object digitally and makes itself something greater than the object by itself.

In this paper, we have come up with the 'Intelligent Traffic Control System for Smart Ambulance'. The main objective of this system is to make it possible for the ambulance to reach a particular location without having it to stop anywhere until the destination is reached. This paper proposes monitoring of traffic lights and its controlling by the driver of the ambulance. Basic information of the patient is taken along with the status of the patient such as critical or non-critical. This information is further used to send it to the hospital. Depending upon

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Wireless Sensor Networks Through Clustering in Cross Layer Network

Neethu Maria John[1*], Simy Mary Kurian[2], Vinodh P Vijayan[3], Neema George[4]

[1]Department of Computer Science&Engineering, Mangalam College of Engineering, Kerala, India
[2] Department of Computer Science&Engineering, Mangalam College of Engineering, Kerala, India
[3]Department of Computer Science&Engineering, Mangalam College of Engineering, Kerala, India
[4]Department of Computer Science&Engineering, Mangalam College of Engineering, Kerala, India

e-mail: neethujohn01@mangalam.in, simy.kurian@mangalam.in, vinodh.pvijayan@mangalam.in, neema.george@mangalam.in
**Corresponding Author: neethujohn01@mangalam.in, Tel.:+91 9947472025*

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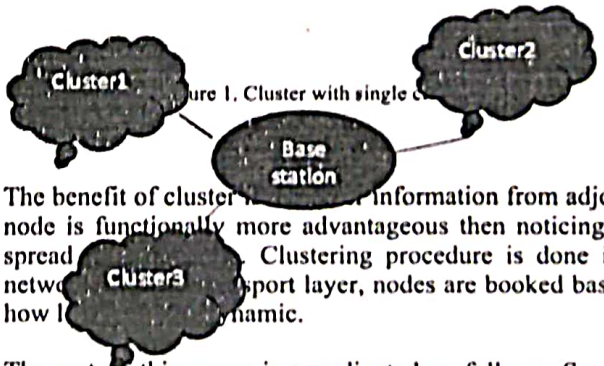
Abstract— One of the significant justification for execution corruption in Wireless sensor network is the upward because of control bundle and parcel conveyance debasement. Clustering in cross layer network operation is an effective way oversee control parcel upward and which at last work on the lifetime of the network. All these overheads are essential in an adaptable networks. The clustering generally experience cluster head failure which need to be solved effectively in a large network. As the center is to work on the normal lifetime of sensor network the cluster head is chosen in view of the battery duration of nodes. The cross-layer activity model optimize the overheads in numerous layer and at last the utilization of bunching will decrease the significant overheads recognized and their by the energy utilization and throughput of remote sensor network is gotten to the next level. The proposed model works on two layers of organization ie., Network Layer and Transport Layer and Clustering is applied in the network layer.

Keywords— Cross layer design, wireless sensor networks, clustering

I. INTRODUCTION

Wireless sensor network comprises of spatially disseminated independent sensors to screen ecological circumstances, for example, sound, temperature, pressure and so forth. Sensor hubs can detect and distinguish occasions in the area and impart information back to the Base Station (BS). Wireless sensor network have become most fascinating area of exploration. Sensor hubs are furnished with little batteries that can store all things considered I J. Restricting the transmission reach and power utilization are the significant requirements presented for correspondence, and henceforth it is profitable to take care of the sensors into cluster.

Clustering in cross layer networks is one of the significant systems to further develop the energy utilization of sensor organization and in this way increment the organization lifetime. In Clustering, entire sensor network is separated into gathering of groups. Cluster head is chosen in light of the battery duration of a node. Cluster head accumulate and consolidate the information and send it back to the BS.



ure 1. Cluster with single c

The benefit of cluster nformation from adjoining node is functionally more advantageous then noticing units spread Clustering procedure is done in the netwo sport layer, nodes are booked based on how l namic.

The rest of this paper is coordinated as follows. Session 2 describes related work on cross layer network tasks. Session 3 depicts about proposed work and execution. session 4

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Improved system for Butterfly Valve

Harikrishnan A R[1], Jishnu[2], Leneesh N Gopal[3], Arun Jose[4]

[1,2,3,4]Department of Mechanical Engineering, Mangalam College of Engineering, Ettumanoor, Kottayam

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Abstract - A cost-effective procedure to surface alloy WCB steel butterfly valve sand castings using mold coatings incorporating metal and ferroalloy powders has been described.The tooling, mold design, and casting conditions similar toplain WCB castings were successfully used to produce sound surface alloyed butterfly castings under industrial conditions. The surface alloying was achieved by adding powders of Ni, Cr, Fe–Si, Fe–Mn, and Mo to the slurry containing a binder coated on the mold surface. The sur- face alloyed coatings on the surface of WCB steel butterfly valve castings were enriched in Ni, Cr, Mo, and Mn up to 6.4, 23.2, 3.3, and 1.1%, respectively. The depths of coatings were as high as 420 lm. After normalizing and tempering heat treatment, the surface alloyed layer exhibited an increase in corrosion resistance as compared to base metal WCB steel.

Keywords: surface alloying, corrosion, austenite phase,heat treatment, butterfly valve, nickel, chromium, manganese, silicon, molybdenum

I.

II. Introduction

Many metallic components used in applications involving exposure to the corrosive aqueous and atmospheric conditions suffer from the degradation of the surface. These problems are especially widespread for castings that are utilized in the water supply industry, including pumps, butterfly valves, valve seats, faucets, and flanges. To prevent corrosion on the surface of these components, water industries rely on coatings or using casting stainless steel components on account of their corrosion-resistant properties.[1] Since corrosion is a surface phenomenon, mainly the surface of components needs to be corrosion resistant as compared to the core of the material, and therefore, surface alloying techniques can be applied to change the composition of surface in order to improve corrosion resistance. Various surface alloying techniques have been reported in the literature. Jiang et al. performed surface alloying of multi-element Ni–Cr–Mo–Cu surface alloyed layer on low-carbon steel and AISI 304 stainless steel materials using a double glow plasma process.[2] It was observed that the relative content of Cr_2O_3 in the passive film of the alloying layer formed on the 304 stainless steel is 3.75% more than that in the passive film of the alloying layer formed on the low-carbon steel, and this corrosion-resistant film was in favor of the corrosion resistance. Majumdar et al. investigated the effect of (WC-Ni-NiCr) used as a corrosion- resistant alloying powder that was applied on the surface of AISI 304 stainless steel by laser surface alloying process.[3] The microhardness of the alloyed zone was significantly improved to a maximum value of 1350 VHN as compared to 220 VHN of as-received c stainless steel. Krishnakumar and Srinivasan used gas tungsten arc for surface alloying stainless steel with titanium and tungsten,[4] and Fals et. al. used laser surface alloying on flame prayed NbC coatings on a stainless steel substrate.[5] Jeyaprakash et al used laser cladding to add nickel and cobalt coatings on stainless steel substrates.[6] Amirsadeghi and Sohi studied the surface melting of austempered ductile iron using the TIG process with molybdenum and chromium as alloying elements that leads to the formation of a hardened alloyed layer.[7]Surface enrichment by ball milling is an alternate technique used to improve the pitting corrosion resistance of stainless steel. 316L stainless steel is enriched with approximately 18% Cr, which helps to prevent surface corrosion, but the addition of Mo can help to prevent pitting corrosion as well.[8] Electric discharge surface alloying has been con- ducted with a chromium anode where in an electric arc produced by the anode lead to