

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

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC		
						Link to website of the Journal	Link to article/paper/abstract of the article	listed in UGC Care list/Scopus/Web of Science/other,
2019-20								
Smart Grid Management in Photovoltaic system using Wireless Sensor Network With IoT	Prof.Pravin G. Bhangale	Electrical	International Journal of A Research In Electronics & computer engineering	2019	(online)-2348-2281 (print)-23939028	www.ijrece.com	http://nebula.wsimg.com/09bf92fc9ec20a51c24bfb74e2af0252?AccessKeyId=DFB1BA3CED7E7997D5B1&disposition=0&alloworigin=1	No
A REVIEW: CONTROL STRATEGY FOR HYBRID-STATCOM WITH EXTENSIVE COMPENSATION RANGE	Mr. Rajesh R. Waghulde	Electrical	International Journal of Research & Analytical Reviews (IJRAR)	2019	E-ISSN 2348-1269, P- ISSN 2349-5138	https://ijrar.org/	https://www.ijrar.org/papers/IJRAR19K8009.pdf	No
Power Quality Improvement By Harmonic Reduction Using Compact Design Multilevel Inverter For Renewable Energy Sources	Prof. Prasad D. Kulkarni	Electrical	International Journal of A Research In Electronics & computer engineering	2019	e-ISSN: 2395-0056 p-ISSN: 2395-0072	www.irjet.net/	https://www.irjet.net/archives/V6/i7/IRJET-V6I718.pdf	No

Improvement Power Quality By Using Customer Devices.	Prof. Prasad D. Kulkarni	Electrical	International Journal of Advanced Research In Electrical, Electronics And Instrumentation Engineering	2019	(online)-2320-3765 (print)-2278-8875	www.ijareeie.com	https://1library.net/document/ynl2eopq-review-improvement-power-quality-using-customer-devices.html?utm_source=related_list	No
Harmonic mitigation of Grid connected photovoltaic using shunt active filter	Prof. Sarita M. Sonawane	Electrical	International jopurnal for research &Development in Technology	2020	2349-3585	www.ijrdt.org		No
Application of D-STATCOM to control power flow in Distribution Line	Prof. Prasad D. Kulkarni	Electrical	International Journal of Advanced Research In Electrical, Electronics And Instrumentation Engineering	2019	(online)-2278-8875 (Print)-2320-3765	http://www.ijareeie.com	http://www.ijareeie.com/upload/2019/august/11_Application%20(1).PDF	No
Multilevel Inverter For Renewable Energy Sources: A Review	Prof. Prasad D. Kulkarni	Electrical	International Journal of Advanced Research In Electrical, Electronics And Instrumentation Engineering	2019	(Print) : 2320 – 3765 (Online): 2278 – 8875	www.ijareeie.com	https://www.ijareeie.com/upload/2019/august/4_Multilevel.PDF	No
Implementation of Static VAR Compansator for Performance Improvement in Electrical Distribution System	Prof.Prasad D. Kulkarni	Electrical	International Journal of Advanced Research In Electrical, Electronics And Instrumentation Engineering	2019	(online)-2278-8875 (Print)-2320-3765	http://www.ijareeie.com	http://www.ijareeie.com/upload/2019/september/3_Implementation.PDF	No
Wireless Voltage and Monitoring for DC Motor Supply	Prof. Kalpesh Mahajan	Electrical	International Journal of Advanced Research In Electrical, Electronics And Instrumentation Engineering	2019	(online)-2278-8875 (Print)-2320-3765	http://www.ijareeie.com		No

Power Factor Improvement of Three-Phase PWM AC Chopper Supplied Induction Motor Drive System Employing HBCC System	Prof. Chaitra N. Panat; Prof. Kalpesh Mahajan;	Electrical	International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering	2020	ISSN (Print) : 2320 – 3765 ISSN (Online): 2278 – 8875	http://www.ijareeie.com	3_Power.PDF (ijareeie.com)	No
A Hybrid STATCOM with Wide Compensation Range	Prof.Kalpesh Mahajan	Electrical	International Journal of Research in Engineering, Science and Management	2019	(Online):- 2581-5792	www.ijresm.com	https://www.ijresm.com/Vol.2_2019/Vol2_Iss11_November19/IJRESM_V2_I11_42.pdf	NO
Fast charging of batteries utilized in electrical vehicle	Mayur Patil; Pravin Bhangale; Kalpesh Mahajan	Electrical	International Journal of Research in Engineering, Science and Management	2019	(Online):- 2581-5792,	https://www.ijresm.com/	https://www.ijresm.com/Vol.2_2019/Vol2_Iss10_October19/IJRESM_V2_I10_115.pdf	NO
A Novel Method for Feature Extraction using Color Layout Descriptor (CLD) and Edge histogram Descriptor (EHD)	V Pradnya, R Kantilal, C Bupendra	Computer	International Journal of Innovative Technology and Exploring Engineering(TM)	2020	Volume-9 Issue-4, PP: 2147-2150, , ISSN: 785-790	https://www.ijitee.org/	https://www.ijitee.org/wp-content/uploads/papers/v9i4/D1379029420.pdf	peer reviewed
RKAP -Tree:Efficient Multidimensional Region Seaching Algorithm	Minal T.Kolhe	Computer	International Journal for Scientific Research & Development	2020	Volume-8 Issue-5, ISSN: 2321-0613	https://www.ijrsrd.com		
Students Safety with Parents, Driver and Management Alerting System using Cloud Technology	Pradnya A. Vikhar	E&TC	International Journal of Innovative Technology and Exploring Engineering	2020	2278-3075	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes

Smart Monitoring and Control of Bus Stand and Goods Transport System Activity using Cloud Computing	Dr. Pradnya A. Vikhar	Computer	International Journal of Innovative Technology and Exploring Engineering(TM)	2020	Volume-9 Issue-4, PP: 791-796, February 2020, ISSN: 785-790,	https://www.ijitee.org/	https://www.ijitee.org/wp-content/uploads/papers/v9i4/C8948019320.pdf	peer reviewed
Design and Development of Low-Cost Humanoid Robot with Thermal Temperature Scanner for COVID- 19 Virus Preliminary Identification	Dr. K. P. Rane	E&TC	International Journal of Advanced Trends in Computer Science and Engineering	2020	2278-3091	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
Design of Drone3dContour: A Novel Contouring System using Altitude Measurement and Cloud-Web Computing	Dr. K. P. Rane	E&TC	International Journal of Emerging Trends in Engineering Research	2020	2347-3983	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
Design and Development of IOT, Web-Server and ML-AVPR based Intelligent Humanoid Robot for Traffic Assistance	Dr. K. P. Rane	E&TC	International Journal of Advanced Trends in Computer Science and Engineering	2020	2278-3091	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
Online Rpi-Web-Server based Blood Cell Analysis for Fast Diagnosis and Monitoring of Disorders for Remote Station	Dr. K. P. Rane	E&TC	International Journal of Emerging Trends in Engineering Research	2020	2347-3983	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes

Symbolic-OTP Based Security System for Domestic Use	Dr. K. P. Rane	E&TC	International Journal of Scientific & Technology Research	2020	2277-8616	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
Design of Issuing and Self-returning Modules for Library Books for Mega Campus by using ARM 7 Web- Server and Cloud	Dr. K. P. Rane	E&TC	International Journal of Scientific & Technology Research	2020	2277-8616	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
A Novel Method for Feature Extraction using Color Layout Descriptor (CLD) and Edge histogram Descriptor (EHD)	Dr. K. P. Rane	E&TC	International Journal of Innovative Technology and Exploring Engineering	2020	2278-3075	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
Real Time Face Recognition and Tracking System with Multi-Camera Arrangement	Dr. K. P. Rane	E&TC	International Journal of Innovative Technology and Exploring Engineering	2020	2278-3075	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
Smart Monitoring and Control of Bus Stand and Goods Transport System Activity using Cloud Computing	Dr. K. P. Rane	E&TC	International Journal of Innovative Technology and Exploring Engineering	2020	2278-3075	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
Students Safety with Parents, Driver and Management Alerting System using Cloud Technology	Dr. K. P. Rane	E&TC	International Journal of Innovative Technology and Exploring Engineering	2020	2278-3075	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes

Diabetic Retinopathy Detection and Grading Using Machine Learning	Dr. K. P. Rane	E&TC	International Journal of Advanced Trends in Computer Science and Engineering	2019	2278-3091	www.scopus.com	https://www.scopus.com/authid/detail.uri?authorId=36500401400	Yes
A study on the impact of Safety Management Practices to Safety Performance among Construction Workers in India	Dr. Sanjay Sugandhi	MBA	International Journal for Research in Engineering Application & Management (IJREAM) Vol. XX, Iss. XX, March 2020	2020				
Impact of Reforms in the Financial sector	Ms. Madhuri Tambe	MBA	Emerging Issues on contemporary Business Practices in the Era of Intelligence (EICBI)	2020		https://www.srms.ac.in/eicbi/		No
Recruitment & selection management.	Mr. Mayur Borse	MBA	Emerging Issues on contemporary Business Practices in the Era of Intelligence (EICBI)	2020		https://www.srms.ac.in/eicbi/		No
New Virtues of Engineering Teacher of India for Modern Era over the Ancient Era	Dr. Sanjay Sugandhi	MBA	Parishodh Journal Vol. VIII, Iss. XII, Dec-2019	2019	ISSN 2347-6648			

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STATCOM with Extensive Compensation Range

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Abstract:- In a three-phase power transmission system a hybrid static synchronous compensator (hybrid-STATCOM) that has a wide compensation range and low DC-link voltage. The system costs can be greatly reduced because of these major characteristics. In this system, the configuration circuit of hybrid-STATCOM is introduced first. Then projected the system parameter design on the basis of consideration of the reactive power compensation range and avoidance of the potential resonance problem. Hybrid-STATCOM is proposed to allow operation under different voltage and current conditions, such as voltage dip, and voltage fault and unbalanced current.

Keywords—Capacitive-coupled static synchronous compensator (C-STATCOM), hybrid static synchronous compensator (hybrid-STATCOM), static synchronous compensator (STATCOM), wide compensation range, low DC-link voltage

1. INTRODUCTION

A hybrid-statcom is proposed, with the qualities of a much extensive compensation range than c-statcom and other series-type ppf-statcoms and a much lower dc-link voltage than traditional statcom and other parallel-connected hybrid statcoms. Many different control techniques have been proposed [1]. To improve the operating performances of the traditional statcoms, cstatcoms, and other ppfstatcoms. Large reactive current in transmission systems is that increases transmission losses and lowers the stability of a power system [2] is one of the most common power problem. One of the solutions for this problem is application of reactive power compensators. Static var compensators (svcs) are traditionally used to animatedly compensate reactive currents as the loads vary from time to time. But, svcs go through from many problems, comparable to resonance problems, harmonic current injection, and slow response. For faster response, static synchronous compensators (statcoms) and active power filters (apfs) were developed for less harmonic current injection, and better performance to overcome these disadvantages. However, the statcoms or apfs generally require multilevel structures in a medium- or high-voltage level transmission system to reduce the high-voltage strain across each power switch and dc-link capacitor, which drives up the operational and initial

cost of the system and also increases the control complexity.

2. LITERATURE STUDY

The literature study section discusses the topics and papers related to the thesis, including the search technique used to obtain the information.

2.1 Overview And Search Technique

The main topics as compared have always been undervoltage/overvoltage contingencies, physical footprint, harmonics, cost and losses. As compared to svc, statcom has smaller physical footprint and reduced low order harmonics generation. Also, statcom has a better performance during undervoltage conditions. Where as svc has a better performance during overvoltage conditions. The svc can have lower cost and eliminations in general.

2.2 Hybrid-Statcom

The advantages of hybrid-statcom was realized by large companies such as abb and siemens. A paper published by siemens was reviewed [3]. A hybrid svc, which is a combination of vsc and tss, is introduced in the paper to combine the advantages of statcom and svc.

2.3 Statcom Modelling

The author in [4] states different and distinct types of statcom modelling. For constant state, statcom can be modelled as an ideal reactive current source. On the other hand, in dynamic studies, statcom can be modelled in two defferent methods.

2.4 Other Hybrid-Statcom

The authors in [5] proposed one more topology for hybrid-statcom. The model consists of an active inverter (vsc) cascaded with a thyristor controlled lc (tclc), the name used for this topology in this paper is hybrid-statcom.

3 HYBRID STATCOM

Hybrid statcom is gaining momentum and is to an increasing degree catching the interest of utilities looking for options that can offer additional benefits to those previously available. Hybrid statcom presents easy extension of dynamic range, superior contingency handling and lower total losses.

- Adding a tsr branch gives superior overvoltage performance.
- With a tsc branch, fast blocking can be applied to prevent overvoltage after fault clearing. Furthermore,

Power Quality Improvement by Harmonic Reduction using Compact Design Multilevel Inverter for Renewable Energy Sources

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Abstract - New construction electrical converter with reduced variety of power switches is projected. This new construction electrical converter supported cascaded Improved H-bridge topology provides easier structure and reduced total harmonic distortion (THD) as we tend to increase numbers of output signal levels of electrical converter. This paper describes a replacement idea of shift with reduced variety of switches and batteries. This idea is to scale back the quality of shift compared to alternative construction inverters. Projected construction electrical converter having twenty one level output is valid with an easy resistive load through simulation in MATLAB simulink 2018a.

Key Words: Cascaded H-Bridge, 21 level Converter.

1. INTRODUCTION

This day's multilevel inverters became common thanks to their ability in voltage function and performance. The multilevel electrical converter is obtained the desired output by using several independent sources of dc voltage. The electrical converter voltage output wave form is obtained nearly sinusoidal wave form with AN increasing variety of dc sources by employing a switching frequency [1]. It shows low switching losses and low voltage stress as a result of many dc sources. Low output of Electro Magnetic Interference (EMI), it shows far above the ground potency and low switching losses and high voltage operation capability and additional operation still receive multilevel inverters. The word multilevel starts with associate three-level electrical converter [2]-[5].

In Power electronic applications, multilevel inverters are getting widespread, as multilevel inverters have the nice ability to satisfy the a lot of demand of power rating and power quality related to reduced range of harmonic distortion and lesser electromagnetic interference. In high switching frequency pulse width modulation (PWM), of multilevel electrical converters has many benefits over a traditional two-level inverter [6]. The lot of engaging options of a multilevel electrical converter is as follows:

1. The output voltage will produce by near to the ground distortion and DV/DT stress.
2. The input current is drained by near to the ground distortion.
3. The common mode voltage is extremely tiny.

4. It works on small switching frequency.

Multilevel inverters are prearranged with the help of power switching devices and capacitor voltage sources. It's appropriate for top voltage applications and voltage waveforms due to their capability to calculate output voltage with higher harmonics to achieve high voltages with most device rating. The major sorts of multilevel inverters are tumbled H-bridge, diode clamped and capacitor clamped electrical converter. It needs less variety of parts in every level capacitor and switches additionally less number of a cascaded H-bridge electrical converter.

This kind consists of series power transfer cells and power will simply obtain. In multilevel inverters tumbled H-bridge it suggests the break up input dc voltage by the mixture of capacitors and switches [11]. It consists of H-bridge cells and every cell will offer the 3 completely unlike voltages similar to zero, positive DC and negative DC voltages. The main advantage of this multilevel electrical converter that wants less variety of parts compared to the opposite 2 types. The value and weight of the electrical converter is a smaller amount compared to the opposite 2 types. Soft-switching is feasible to get the new switching methods[7]. Multilevel cascade inverters are accustomed eliminate the harmonics of Total Harmonics Distortion and also the transformer needed in case of standard point inverters, clamping diodes needed just in case of diode connected inverters and flying capacitors desired in case of flying capacitor inverters. If the supply of every cell need sizable amount of isolated voltage and compare to the 2 types[8]. The planned structure electrical converter Topology has a lot of benefits than the present topologies because the variety of switching devices and Total Harmonic Distortion are reduced[9]-[10]. So the switching losses are reduced, increasing a potency of the output. The planned structure electrical converter needs less number of switches and high potency and fewer numbers of losses. Pulse width Modulation (PWM) methods are currently wide used because of their reduced process demand, simplicity and strength [12]



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Review on Improvement of Power Quality by Using Customer Devices

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ABSTRACT: Cost of various energy storage technologies is decreasing rapidly and the integration of these technologies into the power grid is becoming a reality with the advent of smart grid. Interline Power Flow Controller (IPFC) is one product that can provide improved voltage sag and swell compensation with energy storage integration. Ultra capacitors (UCAP) have low-energy density and high-power density ideal characteristics for compensation of voltage sags and voltage swells, which are both events that require high power for short spans of time. The novel contribution of this paper lies in the integration of rechargeable UCAP-based energy storage into the IPFC. With this integration, the UCAP-IPFC system will have active power capability and will be able to independently compensate temporary voltage sags and swells without relying on the grid to compensate for faults on the grid like in the past. UCAP 3 is integrated into dc-link of the IPFC through a bidirectional dc-dc converter, which helps in providing a stiff dc-link voltage, and the integrated UCAP-IPFC system helps in compensating temporary voltage sags and voltage swells, which last from 3 s to 1 min. Complexities involved in the design and control of both the dc-ac inverter and the dc-dc converter are discussed. The Interline Power Flow Controller (IPFC) proposed a new concept for the compensation and effective power flow management of multi-line transmission systems. In its general form, the IPFC employs a number of inverters with common dc link, each to provide series compensation for a selected line of the transmission system. Because of the common dc link, any inverter within the IPFC is able to transfer real power to any other inverter and thereby facilitate real power transfer among the lines of the transmission system.

KEYWORDS: DC - DC converters, sag / swell, UCAP (Ultra Capacitor), IPFC (Interline Power Flow Controller), Energy storage integration

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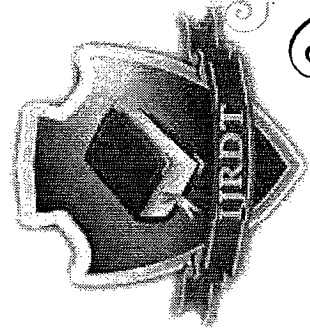
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Multilevel Inverter for Renewable Energy Sources: A Review

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ABSTRACT: Nowadays, multilevel inverter technologies have attracted attention as a convenient solution in many industrial applications. There are a few interesting features of using this configuration, where less component count, less switching losses, and improved output voltage/current waveform. The most significant criteria in multilevel inverter is the minimization of harmonic components in the inverter output voltage/current. The evolution of multilevel inverter technologies and the commercial products based on a multilevel inverter topology has shown tremendous developments due to the many advantages. In this paper, a review of the classical multilevel inverters and the recently introduced topologies are presented. They are trending as the most preferable power electronics device that have been widely used in the applications like motor-drive applications up to Megawatts (MW) power levels, renewable energy (solar/wind power inverters) and reactive power compensation (i.e. STATCOM). This paper provides general comparisons for various types of multilevel inverters and their suitable applications with useful references.

KEYWORDS: Multilevel Inverter; High-Power Applications; Power Electronics Devices.

I.INTRODUCTION

In recent years, the world is getting industrialized. Several industrial applications require sinusoidal waveforms with minimum distortion at a high power. For medium and high power applications, it is difficult to depend on a single switch. Therefore, the concept of multilevel inverters where introduced in 1974[2]. The basic concept of a multilevel converter is to achieve higher power using power semiconductor switches in combination with several low voltage DC sources and to perform the required power conversion by synthesizing a staircase voltage waveform. It provides flexibility in interfacing capacitors, batteries, or even renewable energy sources such as wind energy, photovoltaic energy and fuel cells as the DC voltage sources. The various combinations of these power switches aggregate the sources. The integral multiple of this forms stepped like voltage waveform of high power at the output side. Subsequently on the basis of this concept, several multilevel converter topologies have been developed [3]-[10]. A multilevel converter has several advantages over the conventional two-level converter that uses high switching frequency pulse width modulation (PWM). These features can be summarized as below [11]:

- Staircase waveform quality: Multilevel converter not only can generate the output voltage with very low distortion but also can reduce the dv/dt stresses; therefore the electromagnetic compatibility (EMC) problems can be reduced.
- Common-Mode (CM) Voltage: Multilevel converter produce smaller CM voltage; therefore, the stress in the bearings of a motor connected to a multilevel motor drive can be reduced. Furthermore, CM voltage can be eliminated by using advanced modulation strategies such as that proposed in [12].
- Input Current: Multilevel converters can draw input current with low distortion.
- Switching frequency: Multilevel converters can operate at both fundamental switching frequency and high switching frequency PWM.

The multilevel converters are divided into two based on the number of DC supply sources used as Common DC Source and Separate DC Source, common DC source is further divided into common DC source is further divided into Diode Clamped Multilevel Inverter (DC-MLI) and Flying Capacitor Multilevel Inverter (FC-MLI). The Separate DC Source Multilevel Inverter is commonly known as Cascaded H Bridge Multilevel Inverter (CHB-MLI). It can be of two types with equal DC sources and with unequal DC sources. This has been showcased in fig 1.



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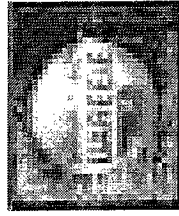

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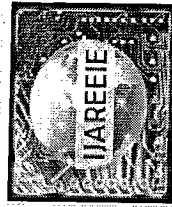
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Power Factor Improvement of Three-Phase PWM AC Chopper Supplied Induction Motor Drive System Employing HBCC System

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ABSTRACT: In this project I am going to improve Power Factor Of Three-Phase PWM AC Chopper supplied Induction Motor Drive System Employing HBCC Technique. The primary objective of the prospective control scheme is to gain input power factor improvement of the IM drive system under different operating conditions. PFI is obtained by frequently forcing the actual three-phase supply currents with the corresponding reference currents, which are developed in phase with the supply voltages, using hysteresis band current control (HBCC) technique. The scheduled control approach has two loops: the inner loop and outer loop. The output of the outer loop is the magnitude of the supply reference current emerging from either speed controller or start-up controller, while the output of the inner loop is PWM signals of the ac chopper. The planned ac chopper features a smaller number of active semiconductor switches, four IGBTs, with barely two PWM gate signals. As a result, the proposed system is easy, consistent, extremely proficient, and cost effective.

KEYWORDS: PWM, Three Phase PWM AC Chopper ,Hysteresis Band Current Control.

I. INTRODUCTION

AC voltage regulators, too call as AC voltage controllers, are used in a range of applications that necessitate a regulated AC voltage. Lighting control using dimmer circuits, domestic as well as industrial heating, speed control and soft starters for the induction motors are examples of such applications [1], [2]. Different methodologies with different control strategies of these regulators in single phase applications and also in three phase applications are presented. The reason of AC voltage controller is to vary the root mean square (RMS) value of its output that applied to the load circuit. There are three control strategies are obtainable to gain this objective; ON/OFF method, phase angle (PA) method and pulse width modulation (PWM) method. All three control methods can be implemented in both single-phase and three-phase applications.

II. LITERATURE SURVEY

In order to minimize drawbacks such as harmonics present at output voltage, discontinuity of power flow present at both supply and load side even for a resistive load, some another issues in driving dynamic loads such as electric motors, etc. arising from the inherent characteristics of the controller AC controllers can be replaced by PWM AC choppers. In order to control the load current, HBCC among various PWM strategies is broadly used because of its inbuilt simplicity and fast dynamic response. Mohamed k. Metwaly , Haitham Z. Azazi , Said A. Deraz , Mohamed E. Dessouki and Mohamed s. Zaky "Power Factor Correction of Three-Phase PWM AC Chopper Fed Induction Motor Drive System Using HBCC Technique." In this paper, an analysis and simulation of a Pwm ac Chopper fed induction motor drive system using HBCC technique is shown. Murat Kale, Murat Karabacak, Bilal Saracoglu "A Novel Hysteresis Band Current Controller Scheme For Three Phase AC Chopper." this paper presents the importance of using Hysteresis band current control scheme and their applications with model.

1. Problem Definition



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In order to get regulated AC supply, AC choppers are generally used in the applications such as lightening control, industrial heating and soft starting of induction motors. The easiest way to control an AC chopper consisting of a pair of triacs is the phase angle control (PAC) because of its simplicity and the ability of controlling a large amount of power economically [33,34], which is termed as the conventional AC chopper. However, it has numerous limitations due to the inherent characteristics of the PAC. That is, a lagging power factor appears at the supply side even for a resistive load [35,36]. As a effect of PAC, the harmonic content of the output voltage and current of the AC chopper is huge, where requires a moderately large filtering stage [37]. Moreover, a discontinuity of power flow appears at both the supply and load sides of the AC chopper as well, which leads to another serious problem in driving dynamic loads such as electric motors [33]. In order to abolish these drawbacks arising from the inbuilt characteristics of these controllers, line commutated conventional AC controllers can be replaced by PWM AC choppers having superior overall performance such as sinusoidal supply current with unity power factor, fast dynamics and significant reduction in filter size [33]. By means of the high frequency switching devices such as IGBT and MOSFET, the supply voltage can be chopped by varying the duty ratio of the PWM modulation signal so as to normalize the load voltage [38].

III. PROPOSED METHODOLOGY AND DISCUSSION

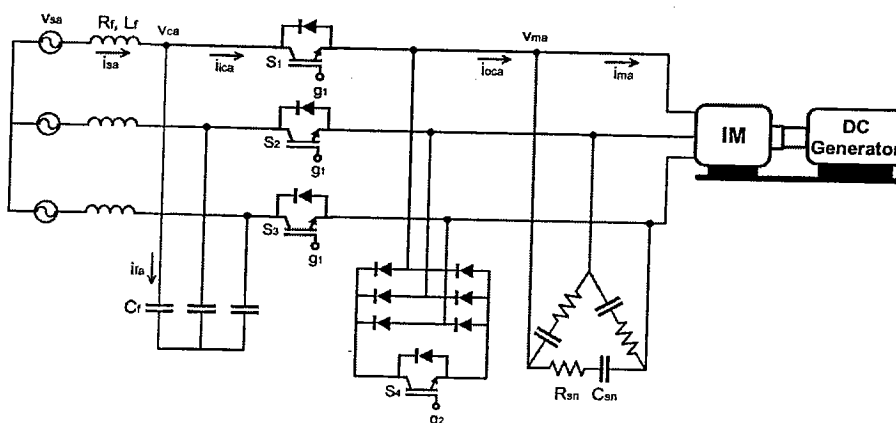


Fig. 1. Power Circuit of the proposed three-phase PWM AC chopper fed an IM drive system

Fig. 2. represents a schematic diagram of the proposed three phase PWM AC chopper fed an IM. The chopper is composed of four power electronics switches (S1; S2; S3 and S4). The three power switches (S1; S2 and S3) are series-connected with the motor. The series-connected switches are utilized to continuously connect and disconnect the motor to and from the AC supply, respectively. Hence, they regulate the delivered power to the motor. While, the power switch (S4) is parallel-connected via a poly phase bridge rectifier with the motor which offers a freewheeling way for discharging the energy kept in the motor windings when the series-connected switches are turned OFF. As series and parallel devices operate in a complementary way, a dead time is introduced to avoid the commutation problems. There are three operating stages: active, freewheeling and dead time. In dead time period, all four devices are turned OFF. Snubber circuit is used to lessen high voltage spikes at IM terminals due to switching of the chopper as well as provide the current path of IM during the dead time period. The input filter is poised of three inductors. The LC input filter is used with the proposed PFC technique in order to diminish the harmonics of the supply current due to switching of the chopper. The proposed control circuit only generates two PWM complementary gate pulses (g1 and g2) which are used to drive the chopper IGBTs in order to make available the three main tasks of the proposed control plan.

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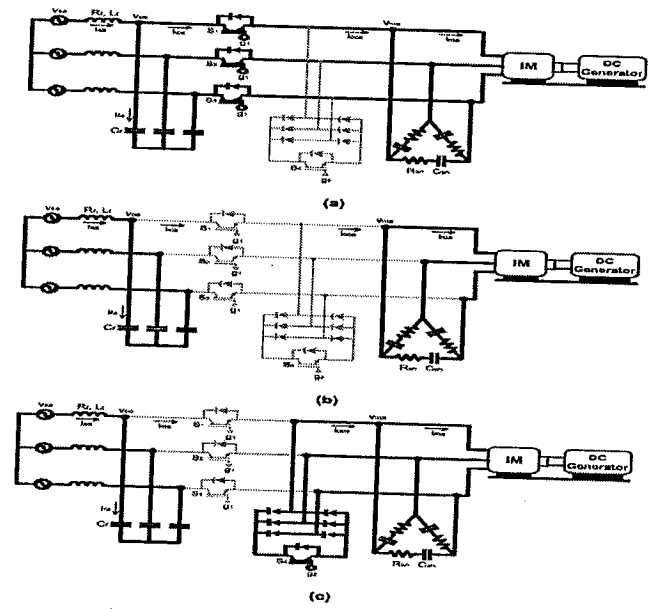


Fig.2. (a)Active stage, (b)Dead time stage, (c)freewheeling stage of the proposed PWM AC chopper fed IM

IV. CONTROL TECHNIQUES

The planned control approach has three main control objectives: soft starting, speed control, and input power factor correction.

A. Soft Starting Mode

The function of the soft starting mode is to create the mention value of the supply current in a manner that confines the starting current of the IM at a predetermined value. The actual current of IM (I_m) is calculated and its RMS value is evaluated by RMS detector. The preset value of the motor current (I_m) and its actual value (I_m) are compared. The assessment of resulted fault is passed into a proportional integral (PI) controller to make the command motor current (I_s). Restraining the starting current provides a soft rushing and reduces the torque pulsations of IM throughout soft starting period.

B. Speed Control Mode

There are numerous methods for calculating the speed of three-phase IMs. These methods can be divided into two main categories according to the control side of the IM:
a) speed control methods through the stator side such as changing the applied frequency, changing the applied voltage, changing the number of the stator poles and voltage/frequency (v/f) control, and b) speed control methods through the rotor side such as rotor resistance control and rotor slip power recovery. Variable frequency drives (VFDs) are the commercial drives. Speed control by VFDs is based on varying both the stator voltage and frequency of the IM. VFDs are extensively used for wide-range variable-speed IM applications. However, they are very expensive and hence not convenient when they are used for limited-range variable-speed IM applications. The task of the speed control mode is to create the reference current value (I_s) in a way that makes the measured speed of IM follows the command speed Command and measured speed are compared and the difference is used as an input signal to a PI speed controller to generate I_s .



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C. PFC Control

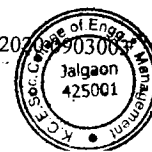
In view of the fact that PWM AC/AC choppers can only alter the enormity of the applied voltage, they are normally negatively viewed; when they are used in IM drive systems, for their slight PF. As a result, the main role of the proposed control policy is to gain high PF in the region of unity as in case of resistive loads. The proposed PFC plan was implemented through starting and speed control operating modes of IM drive while using AC chopper. The principle of harmonic minimization of the planned control plan depends on using PWM technique. Whereas, the principle of reactive power management is to attain PFC depends on the projected current control technique; in which the actual supply currents are obligatory to follow their reference currents that are in phase with supply voltages. The function of PFC block is to incessantly correct the input PF during IM operation.

V. CONCLUSION

The main control objective is to accurate the input PF with different operating conditions of the induction motor drive system. Input PFC is gain by forcing the actual currents of the chopper to track their reference currents that are in phase with the input voltages using HBCC technique. The future control strategy uses only two PWM signals for driving the active switches of the AC chopper. The proposed system is simple, reliable and low cost as it has only four IGBT switches. Operation principle of the proposed system are introduced. The usefulness of the proposed control strategy has been tested at starting, reference speed change and load torque variation.

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A Hybrid-STATCOM with Wide Compensation Range

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Abstract: The hybrid-STATCOM consists of a thyristor controlled LC part (TCLC) and an active inverter part. The TCLC part provides a wide reactive power compensation range and a great voltage drop between the system voltage and the inverter voltage so that the active inverter part can continue to operate at a small DC-link voltage level. The small rating of the active inverter part is used to pick up the performances of the TCLC part by absorbing the harmonic currents generated by the TCLC part, avoiding mistuning of the firing angles, and preventing the resonance problem. Because of these characteristics, the system costs can be significantly condensed. The circuit arrangement of hybrid-STATCOM is introduced first. The hybrid-STATCOM is estimated to allow operation under diverse voltage and current conditions, such as unbalanced current, voltage dip, and voltage fault. A hybrid-STATCOM is proposed, with the distinctive characteristics of a much wider compensation range and a much lower DC-link voltage. The system parameter design is then projected on the basis of consideration of the reactive power compensation range and prevention of the potential resonance problem.

Keywords: Capacitive-coupled static synchronous Compensator (C-STATCOM), hybrid static synchronous compensator (hybrid-STATCOM), static synchronous compensator (STATCOM).

1. Introduction

Power Generation and Transmission is a composite process requiring the working of many components of the power system a tandem to maximize the output. One of the main components to form a main part is the reactive power in the system. It is required to maintain the voltage to distribute the active power through the lines. To improve the performance of ac power systems, we need to control this reactive power in an efficient way and this is known as reactive power compensation. Reactive power compensation embraces a wide and different field of both system and customer problems, especially related with power quality issues, since most power quality problems can be attenuated with an adequate control of reactive power [1]. Reactive power compensation is main for controlling the voltage profile and maintaining the quality of power. Voltage control in the electrical power system is required for appropriate operation of the equipment and reduces the transmission losses [2]. To maintain the power system stability and reliability of system flexible AC transmission system (FACTS) devices are becoming more accepted. FACTS devices are static devices

which assist for compensating reactive power. Traditionally, Static VAR compensator (SVC) has been used to solve this problem, but it has problem of harmonic current injection, resonance problem [3]. Then to beat these disadvantages of SVC, STATCOM is used. But it has also required multilevel inverter therefore circuit complexity is increased [4]. Later, Capacitive-coupled STATCOM were proposed to minimize the DC-link voltage, but it contain relatively narrow reactive power compensation range. To overcome this advantages two hybrid combination structure of PPF in parallel with STATCOM and APF in parallel with SVC was proposed but these two parallel connected hybrid structures may suffer from resonance problem [5]-[6].

To beat the shortcomings of different reactive power compensators for transmission systems, a hybrid-STATCOM is proposed. Hybrid STATCOM consists of the Active inverter part and thyristor controlled LC part. The hybrid-STATCOM consists of a thyristor-controlled LC part (TCLC) and an active inverter part. The TCLC part provides a wide reactive power compensation range the small rating of the active inverter part is used to pick up the performances of the TCLC part by absorbing the harmonic currents generated by the TCLC part, avoiding mistuning of the firing angles, and preventing the resonance problem [7].

2. Details of implementation

The circuit configuration of hybrid-STATCOM is shown in Fig. 1, in which the subscript "x" stands for phase a, b, and c. V_{sx} and V_x are the source and load voltages; i_{sx} , i_{Lx} , and i_{cx} are the source, load, and compensating currents, correspondingly. L_s is the transmission line impedance. The hybrid-STATCOM is made of a TCLC and an active inverter part. The TCLC part is consist of a coupling inductor L_c , a parallel capacitor CPF, and a thyristor-controlled reactor with LPF. The TCLC part provides a broad and continuous inductive and capacitive reactive power compensation range that is controlled by controlling the firing angles of the thyristors. The TCLC part provides a broad reactive power compensation range and a large voltage drop between the system voltage and the inverter voltage so that the active inverter part may continue to operate at a low DC-link voltage level. The active inverter part is composed of a voltage source inverter with a DC-link capacitor



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Fast Charging of Batteries Utilized in Electrical Vehicle

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Abstract: The scarcity of fossil fuel and increasing pollution leads the use of electrical vehicles (EV) and hybrid electrical vehicle instead of conventional internal combustion (IC) engine vehicle. The scope of this paper is to design and develop an electrical vehicle fast charge controller using battery management system (BMS) with Cuk Converter that is powered by an electric motor which gets its supply from rechargeable batteries. This paper will focus on, main battery (lithium ion) and auxiliary battery (lead acid) parts of battery storage, aimed to fast charging of electrical vehicle. An electrical vehicle requires an on board charger (OBC) to charge the main as well as auxiliary battery. The objective of this paper is to design a charger to charge both the battery fast and to reduce the charging stress on main battery by employing an auxiliary battery in Battery Management System. Due to such BMS to enhance battery lifetime, to avoid prolonged charging and to reduce overall cost of battery management system. These proposed topologies are simulated in MATLAB software and some results are shown to show the performance of the system.

Keywords: Bi-directional DC-DC converter, Buck Boost converter, Battery, Isolated converter, Fast charging, Cuk converter


1. Introduction

Rapidly increasing air pollution, fossil fuels consumption in the world, concerns relevant to security and price of energy and increasing global warming are combined to indicate that an acceptable solution is required to replace the internal combustion engine (ICE) vehicles. Therefore, the research institutes and car manufacturers are encouraging to improve recent technologies and deploy of new technologies concepts such as EVs, plug-in hybrid vehicles (PHEV), and fuel cell vehicles in order to address these problems surrounding the ICE vehicles. However, this type of cars as an immature technology suffers from some problems such as short driving range and high cost. To solve these problems, Energy storage system (ESS) acts an important role. Performance of ESS from weight, volume, and cost and life cycle aspects should be improved to make EVs competitive with conventional vehicles. Battery as a common energy storage device is the most important element to improve EVs operation which represents an expensive

component in the system. According to today's technologies, batteries that can supply an EV to run an acceptable driving range comparing with ICE, are very expensive. Another option to improve EVs operation is Hybrid energy storage system (HESS). HESS combines two or more energy storage devices such as battery, Ultra capacitor (UC) and fuel cells. In the HESS topologies which battery is utilized, battery only provides average power (energy) while other sources handle peak power during acceleration and regenerative braking; therefore, batteries have an outstanding role. Over the last years, different types of batteries such as lead acid, nickel-cadmium (Ni-Cd), nickel-metal hybrid (Ni-MH), and Lithium-ion (Li-ion) are employed in EVs applications. The well improved structure of this kind of battery which can be considered as maintenance free is known as Valve Regulated Lead Acid (VRLA) battery. Lead-acid battery has relatively good response time and their efficiency is in the range of 95% to 99%. Higher weight and volume which lead to low energy density compared to other types are the main disadvantage of lead-acid batteries. Ni-Cd batteries are utilized when long life time, high discharge rate, and cost are important factors for designers. However, low energy density and environmental issues are disadvantages of Ni-Cd batteries. Ni-MH battery is able to work in high voltage and has higher energy density but their life time is lower than other batteries.

Recent advancements in Li-ion battery technologies lead to improved power and energy density. Also they have an outstanding capability for long lifetime. Because of these advantages, Li-ion battery is a preferred choice for utilizing in ESSs. In EVs that high power and energy density is required for acceptable mileage, several battery cells should be connected in series and parallel. Employing a bidirectional converter for providing a specific voltage level to drive the system and managing power flow is necessary. Several bi-directional DC-DC converters for energy management in EVs are reported in literature. They can be categorized into basic topologies such as Half-bridge converter, Cuk converter, and SEPIC/Luo converter and derived topologies such as cascaded half-bridge converter and interleaved half-bridge converter. In this regard




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A Novel Method for Feature Extraction using Color Layout Descriptor (CLD) and Edge histogram Descriptor (EHD)

Pradnya Vikhar, Kantilal Rane, Bupendra Chaudhari

Abstract: Now days, Image processing finds diversified applications in almost all field of life. The success of any image processing application is depends on proper feature extraction technique. To extract good and proper features is very interesting and challenging task in the development process. It is used to describe the image based on its contents. These extracted features are used to compare, analyse and/or search the analogous images. There are various feature extraction techniques are found in the literature to design various applications. However any image processing application generates images with high dimensionality, which will be results in the low efficiency of an application.

This paper provides an approach to extract features from the images using MPEG-7 feature extraction techniques. The approach discussed in the paper uses two popular MPEG-7 visual content descriptors; they are namely Edge Histogram Descriptor (EHD) and Color Layout Descriptor (CLD). The concept results in reduction of dimensions of an image to improve the efficiency of the application. It can be used as a heart to design any image processing application as well as provides strong foundation to develop variety of applications.

Keywords: Image processing, Feature extraction, low level features, semantic features, MPEG-7, dimension reduction, CLD, EHD.

I. INTRODUCTION

Feature extraction is a technique to represent an image based on the contents of an image. It is referred as the first and most important step in any image processing application [1][2]. The result and accuracy of an application is based on this step. Careful and proper designed of this step provides the strong foundation to whole application. Two commonly used visual contents (features) are: primitive (low level) features and domain specific (high level/ semantic) features [1][2][3]. The primitive feature represents color, shape, and texture within an image while domain specific features includes for instance, finger prints, handwriting, and human faces. Domain specific features are application dependent and may comprise domain knowledge. Semantics features are obtained by either human interpretations or by complex inference procedure on primitive visual contents. It is a form of high level image description or meta-object [4][5][6].

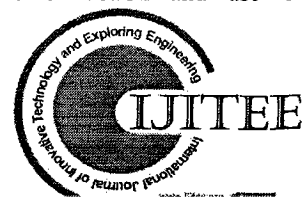
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1.1 MPEG-7

MPEG has developed a new standard called MPEG-7, previously named as multimedia content description interface. To standardize process of searching and retrieval of images, extraction of visual information in the form of various features of images are required, thus emerges Moving Picture Experts Group -7 (MPEG-7) standards [7][8].

It contains a set of standard descriptors (to represent the features) that can be used to describe information from various types of multimedia data. The descriptions are related to the content itself which allows fast and efficient searching and retrieval of information of a user's expectation.

The MPEG-7 standard provides standard set of descriptors used to represent both audio and visual-video contents. It uses XML to store the metadata. The main focus of MPEG-7 descriptors is to standardize [8][9] –

- A set of descriptor schemas (DS) and various descriptors (D)
- The language used to describe these schemas DDL (description definition language)
- A scheme to represent coding the description

MPEG-7 has eight general parts:

1. Systems. It is used to specify the tools required to state different the descriptors.
2. Description Definition Language (DDL): DDL is responsible to specify the language which defines new schema descriptions.
3. Visual: It contains the set of descriptors which are used to recognize the visual parts of the given image/ video.
4. Audio: Audio is used to identify the descriptors which encode the audio part of the material.
5. Generic Entities and Multimedia Description Schemes (MDS): It specifies various descriptors for generic multi-media descriptors.
6. Reference Software: These are the some experimental software tools which are used to perform specific content description.
7. Conformance Testing: It provides set of guidelines for testing conformance to MPEG-7.
8. Extraction and Use of MPEG-7 Descriptions: It is used to generate information about the extraction and use of particular description tools.

Multimedia Content Description Interface (MPEG-7), basically serves two purposes: in Extraction applications and Search & Retrieval application.

1.2 Image Indexing

In general, indexing is done by using keywords or classification codes to each image that are assigned in the form of descriptive metadata and then these keywords are used for image searching and retrieval. But this manual indexing has suffered with many drawbacks including complexity and subjectivity. So now research focused on efficient way to index image by its contents [2][3].

Proper indexing and efficient recognition of images using various visual features becomes an important issue in any image processing application. In such applications, a feature vectors produce to represent an image is high dimensional. This high dimensionality is a curse, as indexing requires comparisons of all feature vectors and it becomes time consuming. Dimension reduction is used as a solution to this problem. This is an separate area of research in image processing. Commonly used standard methods for dimension reduction are PCA (principal component analysis), some researchers also use KL (Karhunen-Loeve) transform. Sometimes to reduce multi-dimension data R-trees, R*-trees, grid files can be used. Some researchers also used Self-Organization-Maps for hierarchical indexing of images [3].

II. METHODOLOGY

The approach suggested here is based on the MPEG-7 feature descriptor algorithm for the purpose of Feature extraction. For this Color layout descriptor (CLD) and Edge Histogram Descriptor (EHD) are used.

2.1 Color Layout Descriptor:

A color layout descriptor (CLD) is widely used descriptor which identifies and generates the spatial relationship of color in an image. The process of feature identification and generation of features using CLD is explained using two steps; selection of representative color from each grid and second, quantization using discrete cosine transform (DCT) [7][8][10].

Color is considered as the most discriminant visual feature and popularly used to describe and represent contents of an image. The MPEG-7 standard has identified and experienced CLD as an efficient procedure to extract the color feature. It again provides satisfactory results in many applications. Being the compact descriptor, CLD is proves efficient in fast browsing and searching applications. It can be used to extract features of both still images and video segments too.

2.1.1 Procedure of Feature Extraction using Color Layout Descriptor (CLD) [10]

1. The image is portioned into 8x8 equal size blocks which results in 64 blocks.

2. From each block a representative color is selected. A representative color is decided by taking an average of values of all the pixels in particular block. This will generated three 8x8 arrays, each representing one color component i.e RGB.

4. Each of these 8x8 matrixes (color component) is then converted to the YCbCr color space.

5. These three components are further transformed by 8x8 DCT (Discrete Cosine Transform). It results into three 8x8 DCT matrices of coefficients, each representing one YCbCr component.

6. To generate CLD descriptor, zigzag scanning of these three sets of 64 DCT coefficients are performed. Zigzag scanning helps to group all low frequency coefficients of the 8x8 matrix together.

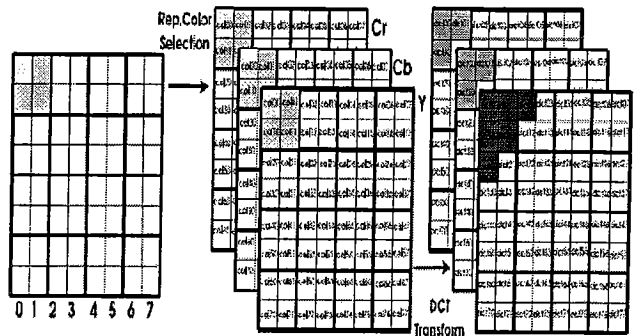


Fig. 1: Feature Extraction using CLD by Zig-Zag Scanning

2.1.2 Procedure to reduce dimension using CLD

1. Apply CLD to get values of three planes by zig-zag scanning.

2. For each image in dataset RGB values is calculated -

Where,

Rvalue, Gvalue, Bvalue are the values of R,G,B

$$Rvalue = \sum_{i=0}^{n=63} Ri / n$$

$$Gvalue = \sum_{i=0}^{n=63} Gi / n$$

$$Bvalue = \sum_{i=0}^{n=63} Bi / n$$

3. Thus each image in database is represented by three values

$$I = [Rvalue, Gvalue, Bvalue]$$

2.2 Edge Histogram Descriptor:

The global feature composition of an image can be characterized by using Histogram. It is translation and rotation independent for the images.

Also normalization of the histogram results into scale invariance. These properties make the histogram most commonly used feature extraction technique for indexing and retrieval applications. Edge also gives its good contribution to represent the contents of the images. Human eyes are also sensitive to edge features for perception of an images [8][9][10]. Edge histogram descriptor (EHD) offered by MPEG-7 descriptor standard, describes local edge distribution in the image. For the efficient storage of the metadata related to particular image, it is always required to minimize size of the histogram.



The normative edge histogram of MPEG-7 produces local edge distribution with 80 bins. These 80 bins histogram represents a standardized semantics for the MPEG-7 edge histogram descriptor.

$$Ed2 = \sum_{i=0}^{n=15} Ed2i / n$$

$$En = \sum_{i=0}^{n=15} En / n$$

2.2.1 Procedure of Feature Extraction using Edge Histogram Descriptor (EHD) [9][10]

1. The image is partitioned into 4x4 non-overlapping blocks. This partitioning of an image always produces 16 sub-images of same sizes regardless of the size of original image.
2. Every sub-image is then characterized by calculating histogram of edge distribution.
3. There are five types of edges in each sub-image: Horizontal, vertical, 45-degree diagonal, 135-degree diagonal and non-directional edges.
4. The edge histogram for each sub-image contains occurrences of relative frequencies for all 5 types of edges.
5. Thus, histogram in every partition contains 5 bins. One bin is representing one of 5 edge types. As every image have 16 partitions, a total of 5x16=80 histogram bins are generated to represent an image.

Where, Ev, Eh, Ed1, Ed2, En- Edge values obtained by calculated values of 5bins i.e vertical edge, horizontal edge, 45° diagonal, 135° diagonal and non-direction edge respectively

3. Thus each image in database is represented by five values representing the type of edge.

$$I = [Ev, Eh, Ed1, Ed2, En]$$

III. IMPLEMENTATION AND RESULT

The approach suggested here is implemented in JAVA in context with Image Retrieval application. The attempt is made to search the similar images as that of input query image. The input image is selected and the features of query image are calculated using CLD and EHD algorithms. Similarly, CLD and EHD are applied to all images in database to extract the features. Comparison between these feature vectors generates an output which contains most similar images as of query image. The approach suggested here is tested on standard IMAGEVARY dataset containing 1000 images.

The query image is given as an input to the developed application; most similar images are listed in the output. Figure shows input image and its partitioning into equal size of blocks.

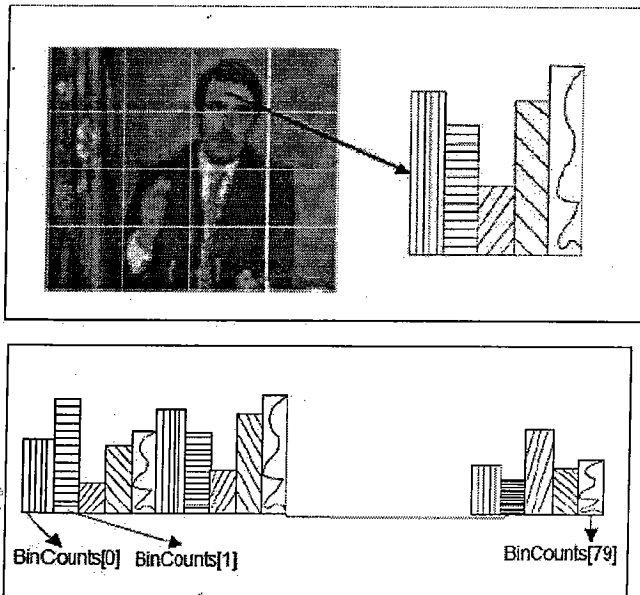


Fig. 2: 80 bins formation using EHD

2.2.2 Procedure to reduce dimension using EHD

1. Apply EHD on each image to get values for all 5-types of edges.
2. For each image in five directional bins are calculated-

$$Ev = \sum_{i=0}^{n=15} Evi / n$$

$$Eh = \sum_{i=0}^{n=15} Ehi / n$$

$$Ed1 = \sum_{i=0}^{n=15} Ed1i / n$$



Fig 3: Input query image and its partitioning

3.1 CLD values of top images retrieved after indexing

As per the methodology discussed in the section 2.1.1, the CLD module is implemented. The result of CLD after applying the indexing is as following-

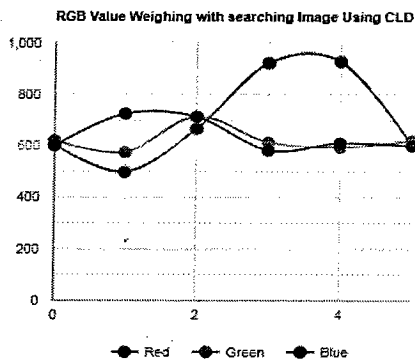


Fig 4: Result after applying CLD

3.2 EHD values of top images retrieved after indexing

As per the procedure mentioned in the methodology Edge Histogram Descriptor (EHD) module is implemented. An input image is given and images with minimum distance measures are retrieved as an output. The result of application of EHD is as shown in figure-

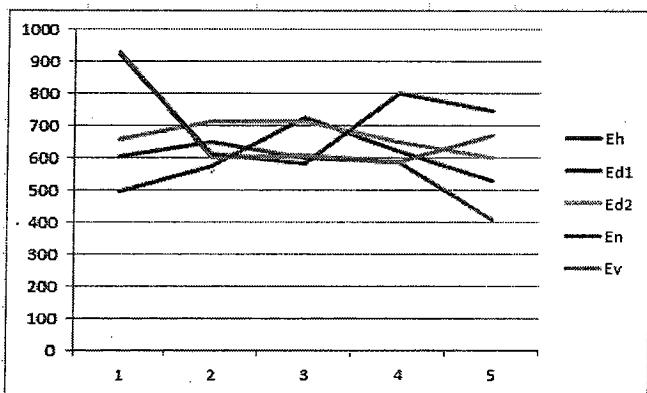


Fig 5: Result after applying EHD

3.3 Comparison of CLD and EHD

Following figure shows the comparison of results after applying CLD and EHD based indexing. The comparison is done using precision, recall and fmeasure retrieval measures.

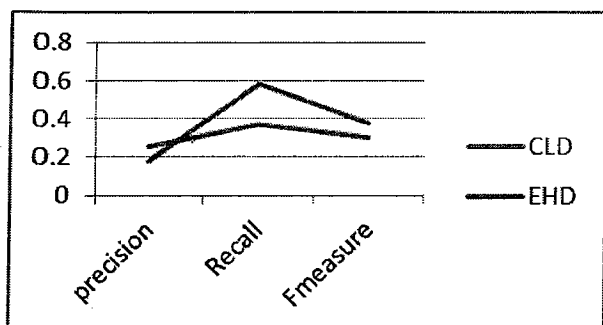


Fig 6: Comparison between CLD and EHD

IV. CONCLUSION

The main contribution of this work is to explore the MPEG-7 Standard descriptors; Color Layout Descriptor (CLD) and Edge Histogram Descriptor (EHD) for feature extraction. Both the descriptors use spatial distribution of image contents and they are invariant to rotation and transformation. Further the need and the importance of low dimensional space in indexing of images in discussed for

efficient retrieval of images. The application developed after feature extraction and reduced dimension is showing good retrieval results. Thus the approach suggested here can provide strong foundation and can apply to any image processing applications.

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Students Safety with Parents, Driver and Management Alerting System using Cloud Technology

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Abstract: Main objective of proposed system is to develop a cloud based smart system for school bus/vehicles that track and monitor the student entering in to the bus and by using cloud computing, alert their parents and school administration about student entering or leaving school bus as well as about any emergency occurs. As all know that in today's fast lifestyle parents don't have more time to drop and pick their children at bus stop or school. There are number of problem occur in the society about safe transportation of children from home to school and vice versa. Parents have always tension about transportation through buses/vehicle. To avoid this problem this system is proposed. Main aim is to develop a system which is beneficial for society, reduce waiting time on the bus stop, reduce crime against student and increase the safe transportation of student from home to school and vice versa. System monitors every student get entered into the school bus. The proposed system will be definitely helpful for real time tracking of school bus. Cloud based system is designed that is configured with Raspberry Pi IOT module for fast processing and data access. This module has to be attached to every bus to capture the real time data. And the data from many buses are well managed by ThingSpeak cloud from MATHWORK. Monitoring and alerting through cloud computing.

Index Terms- Students Safety, IOT, ThingSpeak, GPS, GSM, RFID

I. INTRODUCTION

In today's fast style parents don't have time to drop their children at school. Everyday almost all the students need to move from home to school and vice versa through somewhat means of vehicles. To obtain safe transport of children is critical issue for their parents. The major problem about the school bus is the parents waiting for longtime for arrival of school bus on bus stop. To obtain the security by knowing the current location of bus in case of emergency like traffic jams and abnormal whether condition is essential for parents. The numbers of existing systems are based on GPS tacking and monitoring the location of vehicle/bus on the Google map or sending SMS about location of vehicle to the owner of vehicle, but it requires continuous observation on Google map or on specific mobile apps. To overcome all this problem,

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smart tracking, monitoring and alerting system for school bus is proposed. Proposed system mainly focuses on the alerting to the parents or management in case of emergency or late approaching to school or home. The system is based on the Raspberry pi IOT microcontroller, GPS receiver, GSM module, RFID reader and passive RFID tag. Raspberry pi IOT is heart of system which will process the functioning of total system. In proposed system the tracking of school bus and monitoring student is done by GPS & RFID technology respectively and alerting to their parents and school administration is done by sending SMS about bus location and student status in the bus by using the GSM module. The goal of our system is to alert the parent just few minutes before arrival of bus to its particular stop, thus saving of their precious time by avoiding long wait for bus. To handle 1000s of such buses or vehicle, cloud based system is proposed. The data storage of proposed IOT modules is on cloud and through it only alerting is provided. Sample system is installed at Godavari School buses at Jalgaon. By undergoing this system, parents observed the sense of security by knowing the current location of bus in case of traffic jam.

In 2012, V. Venkatakrishnan et. al. developed ticketing and monitoring system for Public transportation that included ZIGBEE, GPS, RFID and GSM for integration of system. For ticketing, RFID was used and for counting entries and exits, IR sensors were used [1]. Another one system called Smart on board public information system was fixed GPS, GSM/GPRS and microcontroller module on bus. Information about present and next station was informed by comparing the GPS information and scheduled coordinates on display on bus stand. Ideal time of vehicle is decreased and was reported by central office [2]. Abid Khan et. al. had proposed the tracking system using GPS and GSM. Single board embedded system was used with GPS and GSM. The vehicle location was reported by SMS message. The main advantage of the system was totally integrated so that once it was implemented on vehicle then it is easy to track vehicle at any time [3].

The intelligent bus systems develop for campus bus identification monitoring and management system using RFID and sensing technologies. The system reduces manpower significantly. Bus drivers would also be more punctual to the bus schedules that have been established. The integrated technology used in the system was suitable to monitor and manage vehicle transportation system [4]. In 2013, J. Saranya et.al. proposed the system which focused on implementing children tracking system on android terminal for every child attending in the school. Child's movements were tracked in and out of school was possible using this system.

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The administration and parents were alerted accordingly. Crying of children in the school bus is reported by voice recognition system and information is sent to their parents [5].

Another work was focused on the real time bus monitoring and passenger information. The system used link updater locates the bus position along the current route of the bus. The link updater then calculated the time required to reach the end of the current link and updated the estimated end time information in the bus position table. The estimated time for arrival was reported to control room and displayed on display board at bus stops [6]. In 2014, R. Maruthi and C. Jayakumari developed SMS based bus tracking system using open source Technologies. The WAMP server fetched the location name from the database for the corresponding vehicle and sent a reply to the user using SMS. The system was useful for all passengers to board the bus by knowing the location of the bus through SMS [7].

Recently Global navigation satellite system (GNSS) [8] was system of satellite user for positioning and tracking. The main objective of this system was to reduce the waiting time of passenger in bus stop by sending locations to the passenger through SMS. Real time location of bus was displayed on Google maps by using GNSS based web application with speed. GNSS and web technologies were combined the aspects as Google map, web browser and internet for best cost bus monitoring [8].

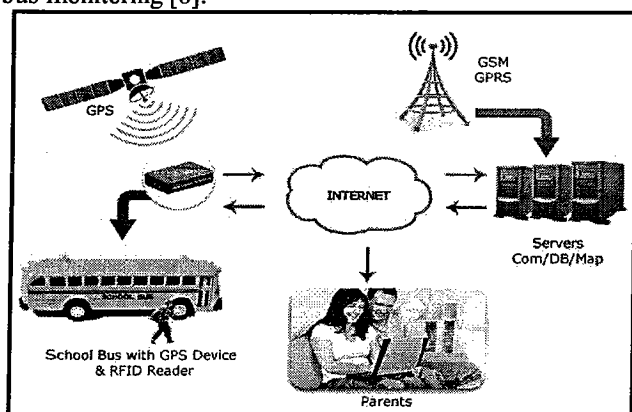


Figure 1: Block diagram of GNSS [8] based Bus Monitoring System

Based on the comprehensive survey of recent technologies, it is observed that all the systems require continuous monitoring. Alerting is rarely presented. It is observed that new proposed system should be more accurate, reliable and processing should be fast and easily accessible through means of specific app or web access. Existing systems are based on the GPS tracking and monitoring the location of vehicle on the Google map or sending SMS about location of vehicle to the owner of vehicle. The existing systems are only for personal vehicle, car and cargo trucks. The existing systems are having small area of application.

II. METHODOLOGY

The present system is specially proposed for school buses. In present system is tracking of school bus and monitoring of student is done by GPS and RFID technology and alert their parents and school administration by sending SMS using GSM module. GSM is suitable as compared with Internet to send message immediately. The cost of GSM module is less, sends SMS on mobile immediately and every parent is having

mobile with them at any time, so GSM is more beneficial as compared to internet. RFID technologies together with GPS and GSM with RASPBERRY PI IOT microcontroller are suitable to be implemented in the school bus monitoring system. In case of any emergency or tedious late mark for particular vehicle is observed into the stored cloud data by using MATLAB cloud computing system, then high alert will be given to the parents or management to avoid any further problems.

III. PROPOSED SYSTEM DESCRIPTION

The system is basically fully automatic for school bus tracking and monitoring of student and alerting their parents and school administration. The system consists of RASPBERRY PI IOT microcontroller (Raspberry pi board), GPS receiver, GSM/GPRS module, RFID tag, RFID reader and LCD output display.

In this system, GPS receiver is used to take the real time location of school bus. Location is compared with location saved in database, if location is match with received location microcontroller process the location and sends alert SMS to student parents of upcoming stop using GSM module about school bus location. At bus stop, student entering in the school bus is having RFID tag as identity card. Every student is having unique RFID tag number. RFID reader is monitoring the entry of students in school bus and send signal to microcontroller. Microcontroller is process the signal and sends SMS to parents and school administration about student is entering on not in to the school bus. Essential information is displayed on output display. Overall Architecture of the proposed system and System block diagram is shown in Figure 2.

A RASPBERRY PI IOT microcontroller is central processing unit of this system which is interfaced with the RFID reader, GPS receiver, GSM/GPRS module and display. The operating System Boots from SD card and a version running on the Linux operating system. RASPBERRY PI IOT monitors the whole functioning of the system.

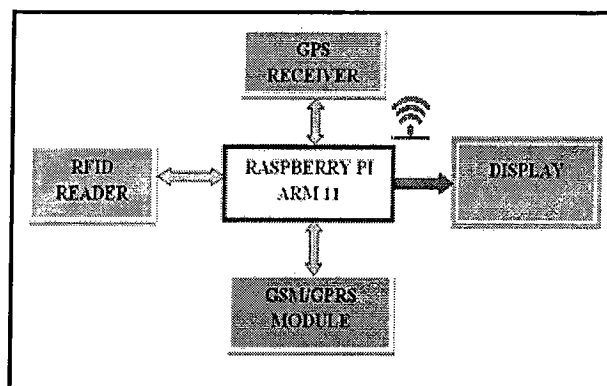


Figure 2: System Block Diagram

The Global Positioning System is the only fully functional Global Navigation System. In order for a GPS to work, it must lock on the nearest 4 satellites to determine its location. GPS receiver is used for real time location tracking of school bus for smart tracking system. GPS receiver tracks the position, speed, time, date, elevation, number of satellite in real time. Real time location tracking of bus is most helpful in critical issue like traffic jam.

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Monitoring and identifying of student is main and essential part of the system. RFID is technology by which digital data can be encoded in an RFID Tag and is read by using RFID reader. The reader is has an attached antenna. It captures data from tags and then passes it to a processing unit. Student monitoring at bus stop and school is done with the help of RFID Reader and Passive RFID tag. Passive RFID tag acts as identity card of student.

Every student has unique tag (card) number. RFID reader monitors entry/exit of student into the bus at bus stop or school. Monitoring of student provides the security for school bus student using our system.

GSM module is used for sending alert SMS to parent of student and school administration. A GSM modem accesses a mobile operator's SIM card. Global System for Mobile Communication can send SMS all over the country immediately. GSM module is operates on AT command. AT commands are recognizable by GSM Module. They are used to communicate via a serial interface with the GSM subsystems. GSM is more beneficial for sending alert SMS to parent as compare with internet facility.

LCD output display is interfaced with Raspberry pi board for the Graphical User Interface. The output of may be display on LCD through HDMI connection. The HDMI connector is used to connect monitor to Raspberry pi board. The output is also being seen on computer/laptop with the help of remote connection with Raspberry pi using SSH connector Putty and Xming. LCD displays the sequences of operation perform by the system.

Algorithms for the proposed system is given as-

RASPBERRY PI IOT board is embedded with the python program to handle the system dedicatedly for specific purpose.

Algorithmic steps of python code are as follows.

- 1) Initialize the system.
- 2) Store the initialization time, date and vehicle number on cloud in 'Initialization database' and in its temporary memory.
- 3) Gives long beep for indication initialization for ready to enter the student into the bus.
- 4) Scan the RFID card of each students entering. Same time counting is done using IR sensors attached for tally purpose.
- 5) If not tally, it gives alert to driver.
- 6) If tally, stores all the data on cloud in 'In Database' and its memory both.
- 7) Time stamp of all the students is available on cloud in 'TimeStamp Database1'. It downloads the time stamp database for particular vehicle and compares the real time with the specified time stamp. If time stamps reaches for particular student, message is send to the student's parent.
- 8) At the particular bus stop, student's id card is scanned and student is allowed to go down the bus.
- 9) It modifies the 'Exit Database'.
- 10) When bus is empty, the driver has to press exit button on the system. System internally compares the in data and out data. The request is also send to cloud for the same.
- 11) If any difference found, system gets alert by system or from cloud.

- 12) Cloud is provided with specific path for bus route in 'Route database'.
- 13) If any diversion in bus is recorded by system or cloud and/or if any big breakdown is recorded by the system/cloud then the alert is given to the driver, parents and management.
- 14) Alert is given in continuous mode until the reply is given by authenticate person for solving the problem.
- 15) If no high alert found, system exits.
- 16) The steps 1) to step 14) repeats for next turn.
- 17) The steps 1) to step 14) repeats for next turn if bus moves towards bus only the time stamp from database 'TimeStamp Database2' is downloaded in step 7.

Hardware system is responsible for sending the data to ThingSpeak cloud and high alert if any in emergency is identified by cloud data analysis using MATLAB interface to cloud data as cloud computing gateway.

The algorithmic steps for the MATLAB computing are given as follows. The various databases has to be created for storage of various data on ThinkSpeak cloud like 'Initialization Database', 'In Database', 'TimeStamp Database1', 'TimeStamp Database2', 'Exit Database', 'scheduled Database' and 'Route Database'.

1. It initializes all the databases.
2. Checks the initialization time, date and vehicle number on cloud in 'Initialization database' and compare with its 'scheduled Database'. If not scheduled, sends alert to driver module and administrator.
3. Checks tally data, from 'In Database', if not tally, it sends alert to management and driver.
4. If requested by the particular bus module, its 'TimeStamp Database1' is selected and sends to that module.
5. When request for exit is send by driver, it checks the 'Exit Database'. If all entries in 'In database' and 'Exit Database' are not same, then sends alert to driver or management.
6. If no difference found, no alert is send.
7. Checks 'Route Database' with the data 'TempRoute database' when bus is on the route.
8. If any diversion in bus is recorded by cloud and/or if any big breakdown is recorded by the cloud (high alert) then the alert is given to the driver, all the parents and management.
9. If no high alert found, sends allow message to driver module to shut down the system.
10. The steps 1) to step 9) repeat for next turn.
11. The steps 1) to step 9) repeats for next turn if bus moves towards bus only the time stamp from database 'TimeStamp Database2' is send to driver module in step 4.

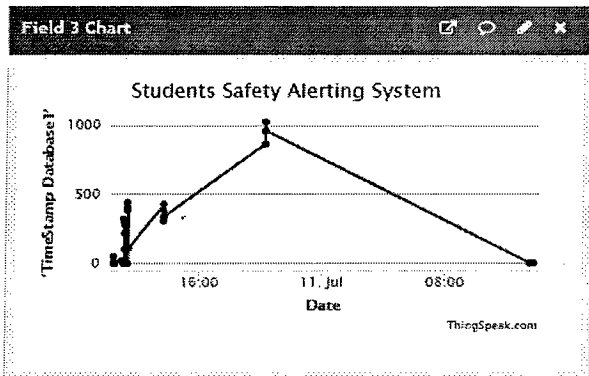
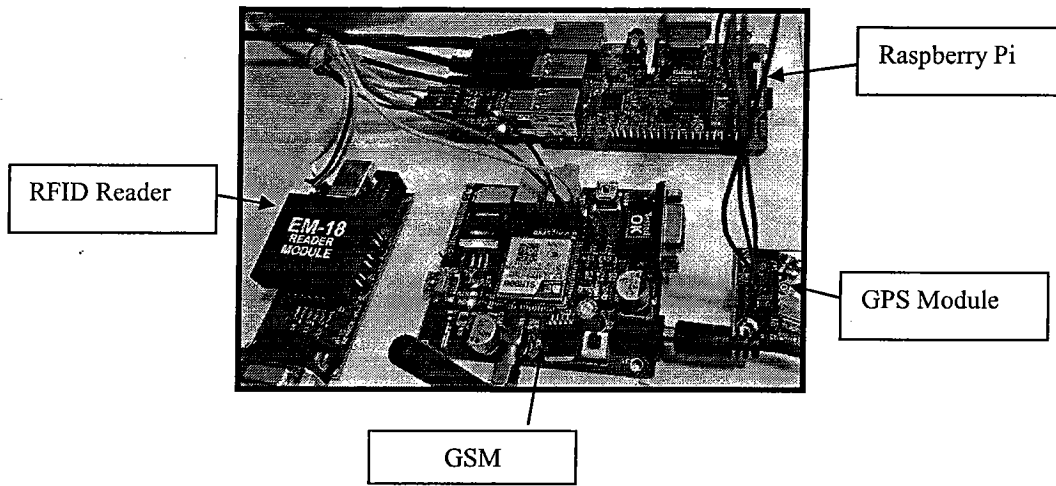


Figure 4.a. TimeStamp Database1

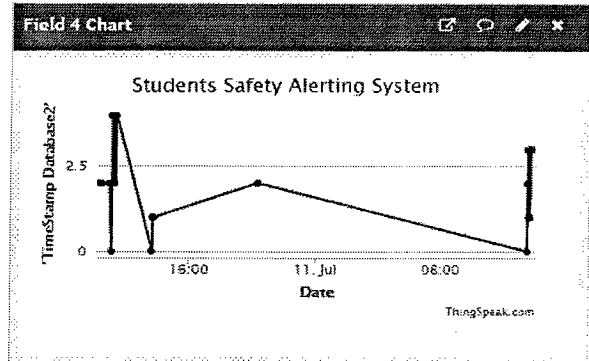


Figure 4.d. TimeStamp Database2

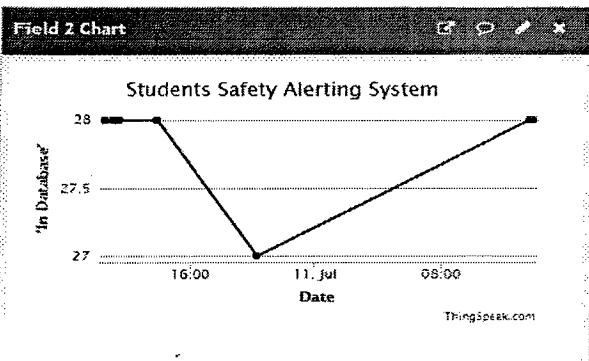


Figure 4.b. In-database

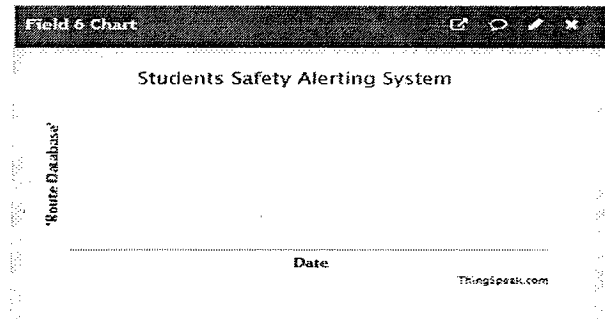


Figure 4.e. Route Database

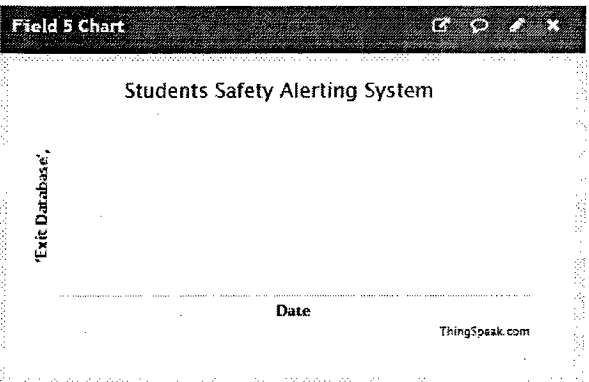


Figure 4.c. Exit Database

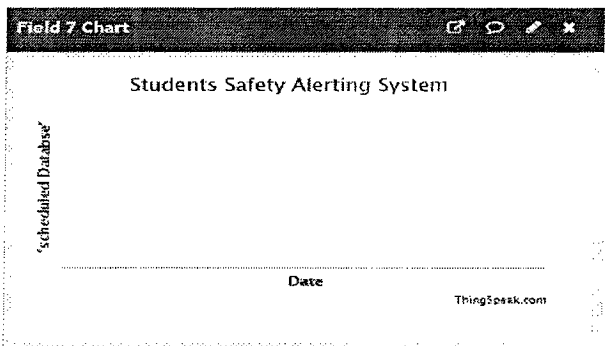


Figure 4.f. Schedule Database

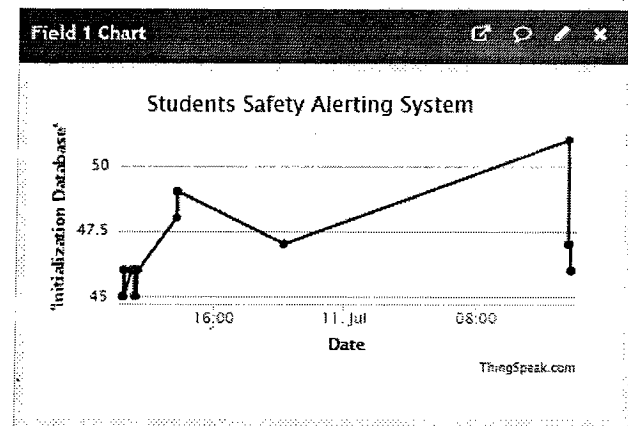


Figure 4.g. Initialization Database

IV. RESULTS

The system implemented is as shown in following Figure 3 that is to be attached to every vehicle. Vehicle must be have WIFI connected internet for cloud access to store real time data.

The ThingSpeak cloud data storage is as shown in Following Figure 4 a-g. The SMS alert will be directly given by MATLAB system through software SMS pack in case of any emergency observes.

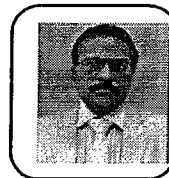
V. CONCLUSION

The proposed system named "Students Safety with Parents and Management Alerting System using Cloud Computing" has been successfully designed and tested. It has been developed by integrating features of all the hardware component and software used. All modules are properly configured contributing best performance. Secondly, using advanced RASPBERRY PI IOT board and cloud computing like growing technology the system has been successfully implemented and tested.

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RKAP-Tree: Efficient Multidimensional Region Searching Algorithm

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Abstract— Recent applications like location-based-provider and social-network-based should handle continuous spatial approximate key-word queries over geo-textual streaming data of enormous amount. The optimization of continuous query processing remains an huge difficulty and performance trouble of both location information and textual information must be equivalent for every arriving streaming data tuple is more serious for spatio-textual streaming data. For geo-textual streaming data the foremost current stage in the evolution of endless spatial-keyword query approaches normally inadequacy of both supports for approximate key-word matching and excessive-performance processing query data. Progressing to address this problem, We propose a completely precise Adaptive spatial-key-word Partition structure, namely AP-Tree, to successfully organize a large variety of queries, the improvement of AP-Tree is adaptable to the spatial and key-word distributions below the guide of a cost model.. Searching is predicated on the Rabin Karp fast string matching algorithm. It's also a hash based method and is functioning on massive pool of data, for achieving higher throughput and excessive efficiency performance enhancement compared to the sooner techniques.

Keywords: Spatio-Textual Query, APTree, RK Search

I. INTRODUCTION

We investigate the matter of processing an out sized amount of continuous spatial-keyword queries over streaming data, which is vital in many applications like location-based recommendation [1] and sponsored search [2], advertising. Monitoring the geo-textual streaming data is critical to efficiently support Geographical system applications. Such as, in tweeter applications, users often subscribe some requests containing both location information and textual contents. Thus, the Geographical system applications should monitor incoming geo-textual streaming data to search out matched messages and notify the users during a period of sometime [3].

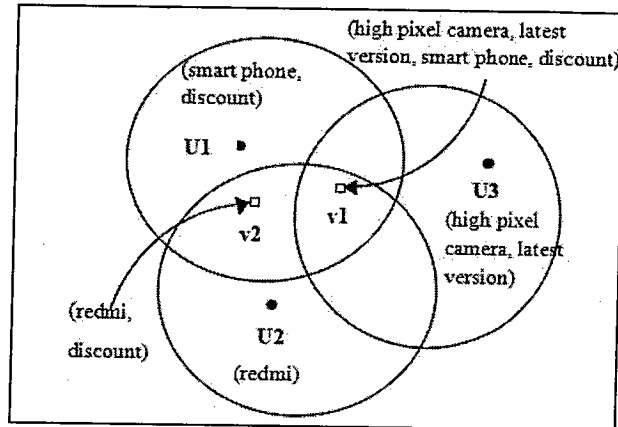


Fig. 1: Location-aware e- voucher system

1) Example 1.

Fig.1 demonstrates a location-aware publish/subscribe system which delivers e-voucher to potential consumers. A user may register her interest as a query specified by a set of keywords and a spatial region. For instance, user U1 wants to keep an eye on the discount smart phone from nearby shopping malls, and hence issues a query with keywords {smart phone, discount} and a circular region as shown in Fig. 1.

Suppose two geo-tagged e-voucher v1 and v2 are released from two shops. Obviously, a e-voucher matches a query if the e-voucher's location is within the query's region, and all the query's search keywords are contained in the e-voucher Therefore, in this example, v1 will be delivered to {U1,U3} and v2 will be sent to {U2}.

The continual queries are an efficient technique for monitoring purposes over streaming data. For geo-textual streaming data, the performance issue of continuous query is more serious since both location information and textual description should be matched for each incoming streaming data tuple. The query approaches are presiding for the expansion of continuous query processing, since they're going to avoid expensive operations of index prolongation comparing to the knowledge alternatives [4]. Meanwhile, because geo-textual streaming data tuples arrive rapidly from data sources, high-performance processing could also be a key requirement for current continuous query methods. In, Xiang Wang [5] presents a correct framework consisting of knowledge types and operations needed to support geo-streaming data. In this analysis searching can be done by string matching like Rabin Karp algorithm it offers a lot of correct results as compared to approximate string matching. Thus its varied applications like bioinformatics, intrusion detection, genetic computing, plagiarism detection, digital forensics, text mining, image and video retrieval, and lots of a lot of.



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String or pattern matching algorithms are accustomed notice the occurrences of a pattern during a given text or an oversized pool of strings. It examination the hash value of strings instead of the letters directly. The characteristic of the algorithm is that the hash function exploits bitwise operations and additionally considers regarding the size of the alphabet and also the length of the pattern. The algorithmic rule is use for looking multiple question strings and with the increasing variety of cores they need achieved an honest speed from string matching [6]. Additionally, this study only handled the range query amongst a spread of continuous queries since our study is based on AP-tree and also the spatial query related to AP-tree is range query.

II. RELATED WORK

This section describes the approaches for static data consider that every spatial object is stored during a spatial database and every spatial object is described with a collection of keywords. Thus, these methods indexed both the spatial information and textual keywords of every spatial object to support spatial-keyword queries. However, current indexing methods for continuous spatial-keyword queries lack the carry for approximate keyword search. Data that's stored inside the memory must be retrieved. Now, various techniques exist, which might be accustomed search and retrieve a required element from the info set. The foremost widely known algorithms used for trying to find part during a given array are Linear Search and Binary Search.

The nearest neighbor search (NNS) problem is an import research topic in image progressing, computer vision and lighting tricks. Linjia Hu [7] gives the aim of NNS is to look for the k closest points during a target set S for any point in query set Q. The keyword search for fetching approximate string matches frequently required when searching geo-textual objects, consistent with descriptions in [8].

Sahil Sharma [9] gives this proposed mechanism NLCS based string approximation method is implanted with traversing method of B-tree for searching nearby keyword stored in B-tree in order that misspelled keywords can directly used as searching keys without bypassing the indexing system. For instance, authors in [10] proposed a hybrid indexing structure that sustain classical inverted lists for infrequent document terms and further expanded R-trees for more chronic geo-textual terms. A more inclusive introduction about processing GeoStreams is available in [11]. In this paper [12], they proposed an R-tree based index structure by combining textual descriptions into R-tree nodes.

Similarly, Zhang et al. proposed an Information retrieval R-tree (IR-tree) [13] that is the fusion of R-tree and inverted files for searching geo-textual data. In specific, they proposed a hybrid index, called IQ-tree, and novel cost models for organizing a stream of incoming Boolean Range Continuous queries[14]. Any other spatial indexing structures have also been used for geo-textual data. However, KD-tree, a generalized binary tree can decrease the time complexity using spatial data structures. KD tree stores just one kind of data and it reduced height of tree. In

[15] an inverted-KD tree was constructed for indexing geo-textual data.

For well distributed point sets, an efficient NNS algorithm in Majid Ahmadi [7], gives KNN tends to look the closest neighbor(s) for a target within the entire training set, hence, the prediction step of KNN is kind of time consuming. KNN could be a method for classification and regression proposed by Cover and Hart, which is one in every of the only methods in data processing classification technology [16].

In contrast to the present indexing methods for the continual spatial-keyword queries, this paper focuses on the challenges of (1) Firstly, an enormous number of queries, typically within the order of millions, are registered in many applications, and hence even a little increase in efficiency ends up in significant savings. (2) Enabling a high-performance solution to take care of the computational performance of the proposed indexing approach for streaming data. (3) Thirdly, novel techniques have to be created to develop spatial-textual indexing mechanism that adapts to both the spatial and keyword distributions of the query workload. (4) Approximate search of keywords.

III. AP TREE FRAMEWORK

AP-Tree is a f-ary tree in which queries are divided recursively in keyword or spatial partitions. To enhance the textual filtering performance, we continuously and effectively incorporate a variant of ordered keyword trie structure. Adaptiveness. Intuitively, with respect to different location and keyword distributions of the query workload, both textual feature and spatial feature may become the dominant factor. Although the keyword filtering component (e.g., local inverted list) is augmented to tree nodes, their overall performance is unavoidably deteriorated. In particular, two partition strategies are convenient, namely spatial partition and keyword partition, are proposed to repeatedly partition a set of queries by spatial feature and textual feature, respectively. A node partitioned by textual (resp. spatial) feature is called keyword (resp. spatial) node.

Notation	Definition
o	a spatial textual object
q	a continuous spatial-keyword query
$o.\$ (o.@)$	a set of keywords for object o (query q)
$o.loc (o.r)$	object location (query region)
w, w_i, w_j	keyword (term)
$Q (Q)$	query set (subset of Q)
$O (O)$	object stream (subset of O)
$V (V)$	vocabulary (subset of V)
N	a node of AP-Tree
N_l	offset of node N
N_r	spatial region of node N
f	fanout of AP-Tree node
$@_q$	partition termination threshold
$@_{KL}$	KL-Divergence threshold
Inf	Infinity

Table 1: The Summary of Notations



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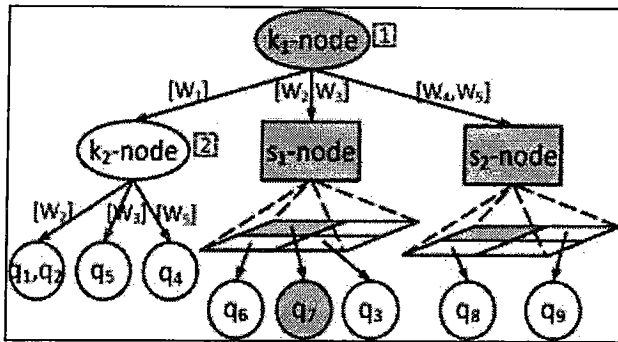


Fig. 2: AP-Tree

A. AP Tree Structure

Based on the above motivations, we devise an adaptive spatial-textual partition tree (AP-Tree for short) shown in Fig. 2 which employs keyword partition and spatial partition methods to recursively divide queries in a top-down manner. In the given structure, N denotes an AP-Tree node and there are three different types of nodes: keyword node (k-node), spatial node (s-node), and query node (q-node). An intermediate node is a keyword (resp. spatial) node if keyword partition (resp. spatial partition) is adopted. We use f to denote the fan out of the intermediate node. A leaf node of AP-Tree corresponds to a q-node, and each query will be assigned to one or multiple query nodes according to its query region and ordered query keywords. Below, we introduce keyword node and spatial node in details.

1) Keyword Node

We assume there's a complete order among keywords within the vocabulary V , and keywords in each object and query are sorted accordingly. We hold up the discussion of the effect of keyword order strategy to the experimental part. Queries assigned to a node N are partitioned into f ordered cuts consistent with their N_i -th keywords, where N_i is termed the partition offset of the node N . We have $N_i < N^*$ if N^* is a descendant keyword node of N . An ordered cut is an interval of the ordered keywords, denoted as $c[w_i, w_j]$, where w_i and w_j ($w_i < w_j$) are boundary keywords. For presentation simplicity, we use $c[w_i]$ to denote $c[w_i, w_j]$ if there's only single keyword within the cut.

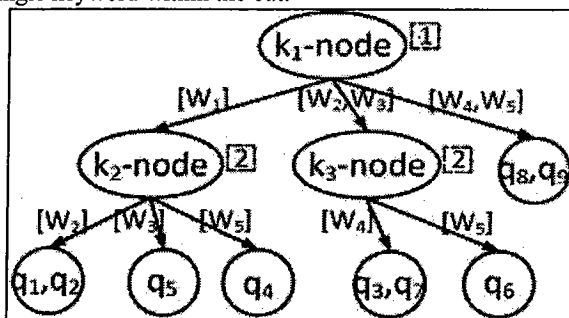


Fig. 3: Keyword Partition

2) Example 2

Fig. 3 shows a special case of AP-Tree in which only keyword partition is used on the running example. We use an oval to represent a k-node and the number on its right side indicates the partition offset. Meanwhile, a q-node is denoted by a circle. Assume there are at most 3 ordered cuts on each keyword node. In k_1 -node with partition offset 1;

we collect the first keywords of 9 queries which correspond to $\{w_1, w_2, w_3, w_4, w_5\}$. These keywords can be divided into 3 cuts: $c[w_1]$, $c[w_2, w_3]$ and $c[w_4, w_5]$. Queries $\{Q_1, Q_2, q_4, q_5\}$ are assigned to $c[w_1]$ whose corresponding node is k_2 -node. Since the partition offset of k_2 -node is 2, the second keywords of these queries, i.e., $\{w_2, w_3, w_5\}$, are used to assign queries into three cuts: $c[w_2]$, $c[w_3]$ and $c[w_5]$, each of which is associated with a q-node.

3) Spatial Node

The space is recursively partitioned by spatial nodes. Let N_r denote the region of a spatial node N , which is able to be divided into f grid cells. A query on a spatial node N is inserted to a grid cell c if $q.r$ overlaps c or carries c . Note that, a spatial node may assign a query to multiple cells, unlike the keyword node within which a query is assigned to a unique cut.

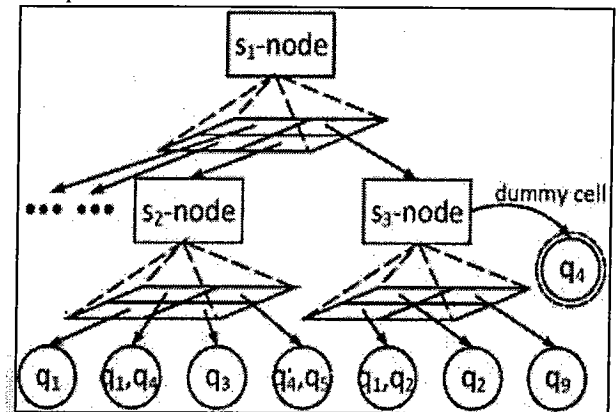


Fig. 4: Spatial partition

4) Example 3:

Fig. 4 depicts another special case of AP-Tree during which only spatial partition is utilized on the running example. We use a rectangle to represent a s-node. In each spatial node, the spatial region is partitioned into 4 cells. To matching an object, we simply navigate through the spatial nodes which contain the object location; up to we reach the leaf node. We remark that the cells on each spatial node might not be of equal size. For each keyword node N , a query Q assigned to N cannot find a cut if there is no enough query keywords, i.e., $|q.k| < N_i$. To keep these queries we use a dummy cut. Similarly, for queries each spatial node N include a dummy cell which contain the region of N (i.e., $N_r < q.r$) and hence do not need to be further partitioned on node N . Note that queries on the dummy cut (resp. cell) may be further partitioned by spatial (resp. keyword) node only, or simply maintained by a query node. For instance, the node indicated by the dotted circle in Fig. 4 is actually a dummy node, because the query region of q_4 fully contains the region of s_3 -node.

Fig. 2 illustrates an example of AP-Tree constructed over the running example, where both keyword and spatial partitions are employed. Queries are recursively partitioned by keyword nodes or spatial nodes, and at last assigned to query nodes.

IV. AP-TREE CONSTRUCTION AND MAINTENANCE

We first propose a cost model to quantitatively analyze the goodness of keyword and spatial partitions. Then efficient



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keyword and spatial partition approaches are devised to minimize the matching cost and presents the AP-Tree construction algorithm which adaptively selects keyword and spatial partition methods to construct AP-Tree in a top-down manner.

A. Cost Model

- Quantitatively measure the matching cost of keyword Partition and Spatial Partition at each node, respectively.
- B_i : a bucket (a Keyword cut or a spatial cell)
- $W(B_i)$: the number of query assigned to B_i
- $P(B_i)$: the hit probability that B_i is explored during the object matching
- The expected matching cost of a Partition

$$C(P) = \sum_{i=1}^f w(B_i) \times p(B_i) \tag{1}$$

Where, P is a partition over a bundle of queries on one node. $C(P)$ is the expected equivalent cost about the partition P . On the other hand B is a bucket of the partition, $w(B)$ is the B 's weight which is the numerous queries connected to B , and $p(B)$ is the probability that B is explored during the query matching. Given the object workload can be simulated by query workload, $p(B)$ can be introduced as the following equation:

$$p(B) = \begin{cases} \frac{\sum_{w \in B} p(w)}{\text{Area}(B)} & \text{if node is keyword node} \\ \frac{\sum_{w \in P} \text{freq}(w)}{\text{Area}(N)} & \text{if node is spatial node} \\ \text{No partition} & \text{else} \end{cases}$$

In Equation 1, $p(w) = \frac{\text{freq}(w)}{\sum_{w \in P} \text{freq}(w)}$ where $\text{freq}(w)$ is the frequency of keyword w among all queries in Q . $\text{Area}(B)$ is the area of the bucket (i.e., cell) B and $\text{Area}(N)$ is the region size of the node N . The optimal keyword partition of and spatial partition can be achieved by a dynamic programming algorithm and a local improvement heuristic algorithm introduced in, respectively. In addition, if N cannot find a cut as there are no enough query keywords then for each keyword node N , a query q is assigned to a dummy cut, i.e., $|q, \$| < N_i$. Similarly, for queries each spatial node N has a dummy cell whose region carries the region of N . Keyword Partition Without loss of generality, we assume the l -th keywords of the queries in Q correspond to a set of ordered keywords $V = \{w_1, w_2, \dots, w_i\}$. Queries are partitioned into f ordered cuts based on their l -th keywords, on each keyword node, and our objective is to find an optimal keyword partition, such that the matching cost is minimized. We first present a dynamic programming approach to achieve the optimal partition.

B. Optimal Partition.

Dynamic Programming Algorithm. By $P_k(i, j, c)$ algorithm we intend a keyword partition concerning keywords between w_i and w_j (both inclusive) with c cuts. The optimal partition is denoted by $P_k^*(i, j, c)$. Since keywords are sequenced, we can come up with $P_k^*(i, j, c)$ by exhausting all possible locations of the first cut as follows.

$$C(P_k^*(i, j, c)) = \min_{i <= m <= j <= c+1} (C(P_k^*(i, m, 1))$$

$$+ C(P_k^*(m+1, j, c-1))) \tag{2}$$

Let $P_k^*(i, m, 1)$ represent the optimal partition which consists of one cut $c[w_i, w_m]$, we have

$$C(P_k^*(i, m, 1)) = \left(\sum_{j=i}^m w(w_j) \right) \times \left(\sum_{j=i}^m p(w_j) \right) \tag{3}$$

Where $w(w_j)$ denotes the number of queries whose l -th keyword equals w_j . 'Algorithm 1' illustrates our dynamic programming method for optimal keyword partition. In particular, Lines 1-2 compute the cost for each partition with single cut. Then Lines 3-5 iteratively compute the optimal partitions with c cuts ($2 < c < f-1$). Finally, the optimal keyword partition P_k^* corresponds to $P_k^*(l, |V|, f)$. The time complexity of this algorithm is $O(f^*|V|^2)$.

1) Algorithm 1: Optimal Keyword Partition (V, f)

Input: V : keyword set to be partitioned

f : number of cuts

Output: P_k^* : optimal keyword partition

```

1. for 1 <= i <= j <= |V| do
2.     Compute C(P_k^*(l, j, 1)) based on Equation 3;
3. for 2 <= c <= f-1 do
4.     for 1 <= i <= |V|+1-c do
5.         Compute C(P_k^*(i, |V|, c)) based on Equation 2;
6. Compute C(P_k^*(1, |V|, f)) based on Equation 2;
7. return P_k^*(1, |V|, f)
    
```

C. Spatial Partition

Without loss of generality, we assume $f = m \times n$ and P_s represents a spatial partition of the node N which divides the region into $m \times n$ grid cells (buckets). We first show that it is an NP-hard problem to find optimal spatial partition.

D. Index Construction

Algorithm 2 BuildIndex(N, Q, I, kP, sP) presents the procedure of AP-Tree construction, which recursively divides queries through keyword and spatial partitions. Given a collection Q of queries passed from parent node, the present node N is also set to q-node, k-node or s-node. Particularly, there are two flags, sP and kP , which want to indicate if queries in Q may be further partitioned by keyword and space, respectively. Line 2 keeps all queries in an exceedingly q-node if the quantity of queries doesn't exceed a given threshold $@q$ (i.e., $|Q| < @q$) or queries cannot be split further by keyword or spatial partitions (i.e., kP is false and sP is false). If keyword partition is allowed (i.e., kP is true), Line 6 explores keyword partition with offset l , and the cost is recorded by C_k . Recall that offset l indicates that the l -th keywords from queries in Q are employed for keyword partition. By C_s we record the price of spatial partition at Line 8 if sP is true. Then we are able to decide the current node N to be constructed from keyword partition (Line 10) or spatial partition (Line 18) base on C_k and C_s . The queries in Q are added to related child nodes (i.e., cuts and cells) for further processing (Line 16 and Line 24), within which the partition offset is increased by one if keyword partition is adopted. Additionally to regular cuts (cells), we also maintain dummy cut (cell) for k-node (s-

node). Specifically, we maintain a dummy cut for a k -node specified queries whose keywords are exhausted (i.e., $|q, S| < l$) are pushed to the dummy cut with kP set to false (Lines 11-13). Similarly, Lines 19-21 push all queries with regions containing the node N to the dummy cell for further potential keyword partition, where the flag sP is about to false. Finally, the AP-Tree may be constructed by the function BuildIndex (root, Q , 1, true, true).

1) Algorithm 2: BuildIndex(N , Q , l , kP , sP)

Input: N : Current node, Q : a set of queries

l : keyword partition offset to be used in N

kP and sP : flags for keyword and spatial partitions

Output: AP-Tree

```

1. if ( $kP$  is false and  $sP$  is false) or  $|Q| < @_q$  then
2.      $N$  is a  $q$ -node
3.     return
4.  $C_k \rightarrow \text{Inf}$ ;  $C_s \rightarrow + \text{Inf}$ ;
5. if  $kP$  is true then /* Try Keyword Partition*/
6.      $C_k \leftarrow$  keyword partition on  $Q$  with offset  $l$ ;
7. if  $sP$  is true then /* Try Spatial Partition*/
8.      $C_s \leftarrow$  spatial partition on  $Q$ ;
9. if keyword partition is chosen (i.e.,  $C_k < C_s$ ) then
10.     $N$  is a  $k$ -node with offset  $N_i = l$ ;
11.     $Q' \leftarrow$  queries  $\{q\}$  in  $Q$  with  $|q, S| < l$ ;
12.     $B' \leftarrow$  dummy cut of  $N$ ;
13.    BuildIndex( $B'$ ,  $Q'$ ,  $l+1$ ,  $kP = \text{false}$ ,  $sP$ );
14.    for each child node (i.e., cut)  $B$  of node  $N$  do
15.         $Q_B \leftarrow$  queries in  $Q - Q'$  which hit the cut  $B$ ;
16.        BuildIndex( $B$ ,  $Q_B$ ,  $l+1$ ,  $kP$ ,  $sP$ );
17. else
18.     $N$  is a  $s$ -node;
19.     $Q' \leftarrow$  queries in  $Q$  which contains  $N$ ;
20.     $B' \leftarrow$  dummy cell of  $N$ ;
21.    BuildIndex( $B'$ ,  $Q'$ ,  $l$ ,  $kP = \text{false}$ ,  $sP$ );
22.    for each child node (i.e., cell)  $B$  of node  $N$  do
23.         $Q_B \leftarrow$  queries in  $Q - Q'$  which overlap or contain  $B$ ;
24.        BuildIndex( $B$ ,  $Q_B$ ,  $l$ ,  $kP$ ,  $sP$ );
    
```

E. Rabin-Karp

Rabin-Karp string searching algorithm computes a numerical (hash) value for the pattern p , and for every M -character substring of text t . Then it compares the numerical values rather than comparing the particular symbols. If any match is found, it compares the pattern with the substring by naive approach. Else it moves to next substring of t to check with p .

1) Algorithm 3: RabinKarp

Length of pattern = M ;

Hash(p) = hash value of pattern;

Hash(t) = hash value of first M letters in body of text;

Do

if (hash(p) == hash(t))

brute force comparison of pattern and selected section of text

hash(t) = hash value of next section of text, one character over

while (end of text or brute force comparison == true)

The Rabin-Karp string matching algorithm computes a hash value for the pattern, yet as for each M -character subsequences of text to be compared. If the hash values are same then the algorithm will calculate and analyze the hash value for next M -character sequence. For each text subsequence, there's just one comparison required and character matching is simply required when the hash values match.

V. INDEX MAINTENANCE

In practice, we may have to dynamically maintain an AP-Tree because of registration of latest queries and deregistration of existing queries. A straightforward strategy is that we put a replacement query into its corresponding query node supported its ordered query keywords and query region, and a question node is partitioned when its number of queries exceeds the edge $@_q$. Similarly, we remove a question from its corresponding query nodes if it's deregistered and a keyword node or spatial node turns to a question node if the quantity of its descendant queries is a smaller amount than $@_q$. This approach is efficient and works well if the underlying query workload remains stable. On the downside, the partitions of the present nodes can't be adjusted to the change of query workload, and hence the performance is also deteriorated. To alleviate this issue, we adopt the well-known KL -Divergence [3, 1] to detect the changes of underlying query workload for nodes with a selected amount of queries. Specifically, let $W_{old}(B_i)$ denote the burden of the bucket B_i when the node is built while $W(B_i)$ is calculated for all current queries. Let $D_{KL}(W_{old}|W)$ denotes KL -Divergence of the query workload, and AP-Tree nodes are re-constructed if $D_{KL}(W_{old}|W)$ exceeds a given threshold $@_{KL}$.

A Problem Formulation. We first define the notations of a geo-textual data stream. Then, we introduce the definition of the continual spatial approximate keyword query over the geo-textual data stream. Finally, the matter is stated. We remark that calculation of KL -Divergence value is sort of cost-free because they will be easily updated when the node is visited during the query updates. Moreover, only descendant queries of the node are involved within the reconstruction. During this way, our empirical study shows that AP-Tree is self-adjustable to the workload changes with an honest maintenance overhead.

VI. RESULT AND DISCUSSION

We first provided an experimental setup, then evaluated and discussed the performances of RKAP-Tree against geo-textual streaming data. The data sets used in this paper is synthetic data. Synthetic data contains id, time (t_1 , t_2), Keyword, coordinates (x_1 , y_1 , x_2 , y_2). The dataset contains various sizes of data files from 500 up to 1000000 and more.

A. Evaluating and Discussing AP-Tree

In this section, we evaluate creation time, searching time, and memory size required by various algorithms along with AP-tree over a geo-textual data stream. For comparison, we



used Cell, KD Tree, and Cell-KD Tree due to the reason that in Cell based searching overlapping occurs because cells are limited and data lies on boundary is lost, KD Tree allows only one type of data and reduces height of tree, Cell-KD uses advantage of Cell and KD Tree respectively. We directly employ the specified data structures to process continuous spatial approximate keyword queries in our setting.

B. Creation Time

It is observed that AP Tree consumes less time for creation of any size of data.

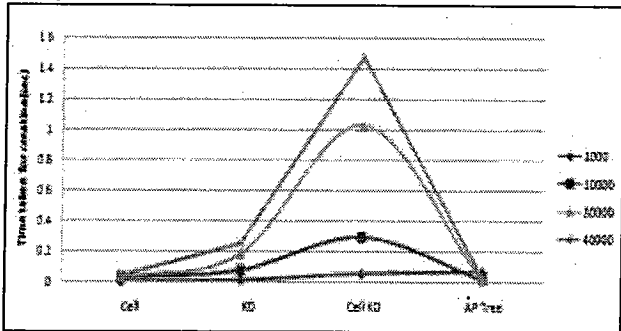


Fig. 5: Data structure creation time

C. Searching Time

In below table, shown time taken for searching for different trees like Cell, KD, Cell-KD and AP Tree for same searching algorithm and it is clearly shown that time taken for searching in AP Tree is extremely less as compare to other data structures. Different colour lines indicate a searching different size of record files like 1000, 10000, 30000, 40000. And it also clear that time taken for searching different size of record in same AP Tree is approximately same or there is slightly difference between them.

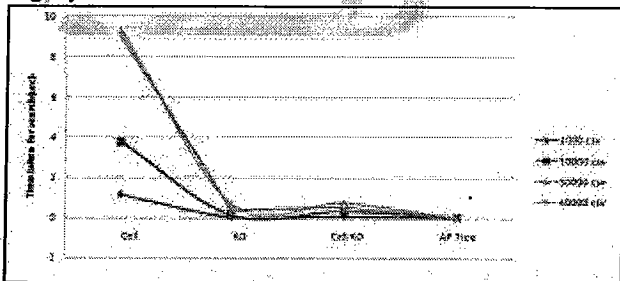


Fig. 6: Searching result of RK search

Above graph shows the searching time required to search same size of data using same searching algorithm (RK Search) on different data structures to show AP Tree produce result in less time as compare to other specified data structures.

D. Memory Size

In below table, shown memory required for different trees like Cell, KD, Cell KD and AP Tree, It is observed that AP Tree required more memory than other data structures due to in Cell boundary data is lost and KD Tree create two different trees to store keyword and spatial data, Cell-KD Tree combine both concepts of Cell, KD Tree. AP Tree stores Keyword data, Spatial data, and Metadata. Using metadata AP Tree reduces searching time by checking query

metadata stored in nodes. Metadata in node contains range value of its child nodes. If node doesn't contain query range then it check in its sibling node and continue further.

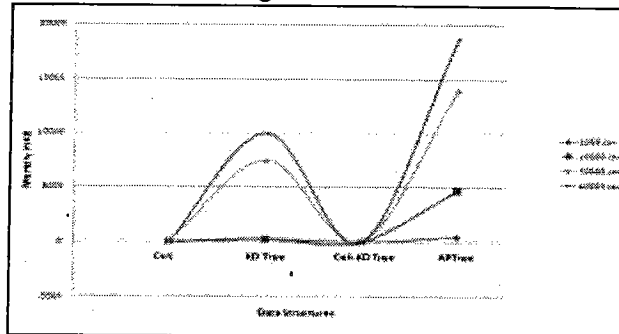


Fig. 7: Total memory required

VII. CONCLUSION

We will propose a novel adaptive spatial textual partition indexing structure, namely AP-Tree, to efficiently organize an enormous number of continuous spatial keyword queries specified each incoming object from spatial textual data are often rapidly delivered to relevant queries. Unlike the previous spatial-textual indexes which prefer either textual feature or spatial feature, AP-Tree is constructed in an adaptive way by carefully choosing keyword or spatial partitions guided by a cost model. Substantial experiments illustrates that our technique achieves a high throughput performance over streaming spatial-textual data. It is a basic requirement for several current applications to support continuous spatial-keyword queries. However, existing spatial-keyword query indexing approaches generally don't apply for approximate keyword matching. To deal with this problem, this paper first proposes an indexing approach for efficient supporting of continuous spatial approximate keyword queries by integrating RK search to AP-tree to support the approximate keyword matching between queries and streaming data tuples, namely RKAP-Tree. To improve the performance of RKAP-Tree, it will be implemented on CUDA processor.

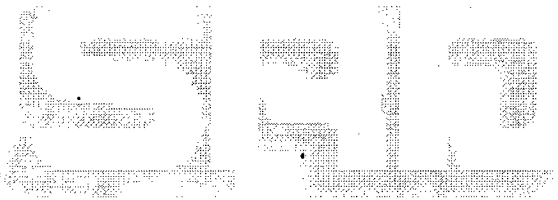
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Smart Monitoring and Control of Bus Stand and Goods Transport System Activity using Cloud Computing

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Abstract: This work focuses on the, implementation and validation of smart public transport system as well as goods transport system based on the application of GPS (Global Positioning System) technology, GSM (Global system for mobile communication) using Cloud computing. This system has been distributed into four modules as In-Bus/truck module, Bus/truck-stand module, cloud system and user mobile apps. After initialization of In-Bus/truck module, driver gets the information regarding to the platform availability on parking zone that are assigned to it. If the platform is vacant then driver needs to park the bus/truck at said position only. The drivers may get allotted or waiting parking platform's information through SMS or on Drivers app. The GSM integrated GPS technology can also be used to get the current location of vehicles and the available vacant seats or vacant space in truck. This information will be recorded automatically by the system. IOT module ESP12E NODEMCU is used for controlling and handling whole operations by collecting the data. This system will also guide the drivers and the bus/truck stand controller to control all vacant ports based on real time operation. One In-Bus/truck module (configured along ESP12E) needs to be installed into each vehicle to be monitored. One Bus/truck-stand module has to be installed in to each platform. Cloud system is needed to collect the whole data for big public/goods transport systems for automation of 1000s of vehicles at a time. ThingSpeak cloud is used and computing is performed by MATLAB computing. For late running, on-time running and before time running vehicles, messages are automatically sent regarding to its location and vacant seats/space. And will be displayed on rolling board on platform. Passenger/user may get the correct information by sending message on his mobile from anywhere through mobile app. Mobile app is developed to perform all the task of monitoring passenger/user, and drivers.

Index Terms- GPS, GSM, Bus/truck Stand (Platform) module, Bus/truck Side Module, ESP12E, IR Sensors

I. INTRODUCTION

Transport is one of the important needs of any country. The main problem about the transportation is the waiting time due to traffic jams. The safety of all types of vehicles is a major concern so novel approach of vehicle tracking system ensures proper monitoring with their safety while travelling.

By doing comprehensive survey related to scope of bus/truck stand monitoring and control technologies available

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today in India, it is found that there is big scope to develop various types of applications and improvements for bus/truck stand monitoring and for it's controlling.

Vast works has been already reported in the field of bus/truck tracking system. But it is needed to co concentrated on some practical aspects like availability of parking zone, availability of reserved waiting zone for vehicle and awareness in public to use it. If the actual platform allotted for parking is not vacant then the driver will have to wait at waiting place or if both places are not available then drivers has to be prior intimated for speed control. Nowadays, most of the people are using mobile applications in their daily use so its today's need to work on such emerging topics. Driver app is also designed for getting message with voice assistance system during driving. Received message will be repeated until the driver simply clicks on mobile or until next message is received.

Whole operation of proposed system is performed with basis of four module 'In-Bus/truck module' (Bus/truck side module) and 'Bus/truck-stand module' (Platform side module), 'Cloud System' and 'Mobile apps'. It provides the access to real time information related to bus/truck schedules, arriving time and departure time etc through the display at bus/truck stands. Internet connectivity as well as self-service Short Messaging Service (SMS) is used for maintaining connectivity. Displaying vacant seats/space on platform in case of bus transport/truck transport truck respectively and displaying vacant platforms for bus/trucks inside the bus/truck-stand is performed by the proposed system. Number of present person in the bus or number of goods present in truck, their counting in bus/truck side and locating the vacant positions of the platforms on platform side can also be handled by the whole system.

Bus/truck tracking system is required to be installed in In-bus/truck module and bus/truck monitoring system has to be installed in bus/truck-stand module. Bus/truck stand monitoring system will display the status of number of bus/trucks likely to be approaching to bus/truck stand. Cloud computing module will collect the data about all the parking zones from Bus/truck stand module and corresponding resultant of computed data is provided to the bus/truck-stand module of asking bus/truck for handling 1000s of vehicles at a time. Good features of this system is that all the modules are configured and designed with GPS, GSM, ESP12E IOT modules and various sensors. IR sensors are used to count the entered and exit person or goods in bus/truck.

It then saves the record for the communication to bus/truck-stand module and sends to cloud for further processing. With the help of that numbers, number of vacant seats or vacant space in the specific bus/truck can be reported at bus/truc-stand module. For counting the vacant seats, two IR pared sensors gives us the best result.

II. LITERATURE REVIEW

In 2008, a specific system was developed that involved some fundamental features of real-time monitoring for daily operations in Beijing bus Company that are realized in the BJ-BMS [1]. In 2010, integration of RFID and GIS was proposed. RFID based Identification was developed and monitoring system was also implemented based on the RFID. To monitor the movement and the positions of the campus bus, improved system was developed [2]. In 2011, GIS system was identified that analyzed and displayed geographic information. This work was targeted on the GIS application for identification of bus/truck detection. The intelligent monitoring system was also developed [3]. Again in 2011, moment of the bus was detected and monitored with the help of integration of RFID and combined sensing techniques like GIS, GPS, and GPRS. A decision algorithms based on ruled and new theoretical framework was developed for the becoming efficient system [4].

GPRS and Zig-Bee technology based supervisory system was developed in 2012. Efficiency of system was realized in intelligent transportation and bus monitoring [5]. In further work, the direction of the vehicle was monitored [6]. Dynamic vehicle monitoring and scheduling system based on Arc-GIS Server was also included in this work. The strong distance calculating ability of Arc-GIS technology was also discussed so that vehicle incoming time is calculate in advance, so the foreground of the system can manage and upload graphics and video information to accomplish monitoring and scheduling [7]. Message exchange was used to maintain accurate location of bus with minimal computation requirements in the work thereafter [8]. Data addition and calibration system for a new Flex Ray bus based on the high-speed and flexible USB interface was designed in latest work [9].

From the survey, it is concluded that, we may use various sensor based systems but the system based on reliable, cheaper, easily available system components with latest technology are to be considered.

III. METHODOLOGY

Proposed system is categorized in to four segments, out of which two main modules as Bus/truck Side module, Bus/truck-stand Side module are as shown in Fig 1 and Fig 2 respectively. In Bus/truck side module, GSM is integrated with GPS and IR sensors around IOT module. With the help of GPS, longitude and latitude of the Bus/truck can be recorded. Exact location of the bus/truck can be calculated from it. Counting the number of person entering and exiting or counting the goods space in the bus/truck respectively is performed using two IR pair sensor.

From user, the enquiry may be received for location and number of person present or vacant space in the bus/truck with the use of GSM module. If enquiry is received for the location of the bus/truck then it sends the correct location to the mobile number from which enquiry has been received. If

enquiry is from many people then same will be sent to all. System constantly monitors the receiving SMS regarding to the bus/truck platform vacant status and shows the status on driver screen if enquiry is initially placed by driver for the same.

Main operations of In-Bus/truck Module are as follows.

- 1) Count the amount of space available in the truck using two IR pair sensors or continuously counts the number of persons entering and exiting in the bus using two IR pair sensors.
- 2) Continuously capture the location of moving bus/truck using GPS.
- 3) Receive the enquiry for location and number of person present or place available in the bus/truck respectively using SMS from GSM module.
- 4) If enquiry is for the location of the bus/truck then it sends the current location to the mobile number from which enquiry has been received.
- 5) If enquiry is for the number of person present or vacant space in the bus/truck then system sends the correct number of persons or vacant space details to the mobile number from which enquiry has been received (this mobile number may be of user or of Bus/truck-stand module).
- 6) If enquiry has been placed by driver for vacant platform, it collects the information by receiving SMS and/or through internet wifi about vacant status of bus/truck platform.
- 7) Display the status on driver screen on In-Bus/truck module.

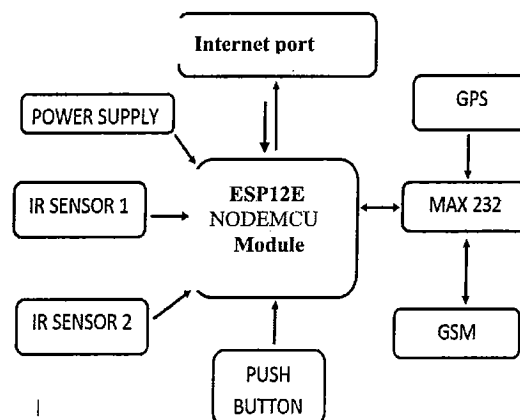


Fig 1: Block Diagram of In-Bus/truck Module

Bus/truck Platform Side Module is second part of the system, in which ESP12E NODEMCU-IOT model is used with GSM as well as two IR pair sensors for counting the vacant and un-vacant positions of the platforms. One Bus/truck Platform Side Modules have been installed at every platform for sensing the vacant position and then the control is given to the processor by wired network. Vacant platform information is stored on cloud. If enquiry is received by different drivers, GSM module has to send the vacant position status of platform assigned to the vehicle to the corresponding drivers those are registered with system by checking its status on cloud. Cloud system has the detailed schedule of all the vehicles running to the particular day. On time vehicle, late vehicles and before time vehicles within the time of one hour are only considered for the assignment of free platforms.

For such vehicles, it assigns the free platforms and sends the information to Bus/truck-Stand Platform Side module for display and for sending to the enquiring driver through internet wifi. For other than such vehicles, if enquiry receives from driver, 'blank' information has to send back to driver module through GSM. If information is not received from cloud in any case specifically because of internet problem at the place of platform, information may be directly sent to of In-Bus/truck driver module through internet wifi so that vacant position may be displayed on of In-Bus/truck driver module.

Main operation of Bus/truck Platform Side Module is as follows.

- 1) Count the vacant and un-vacant positions of corresponding platforms.
- 2) Constantly send the vacant position and status of platform through internet to cloud.
- 3) Similarly all the modules have to send their vacant position to cloud through internet. Cloud updates the vacancy report.
- 4) If enquiry of vacant platform is received from driver through GSM, message is diverted to cloud through internet.
- 5) It analysis the inquiry vehicle number in schedule, if it is in its schedule limit of 1 hour then the assigned platform's status is send to Bus/truck-Stand Platform module.
- 6) It diverts the platform vacancy message to enquiring driver of In-Bus/truck Module.
- 7) In-Bus/truck Module displays it on its display.

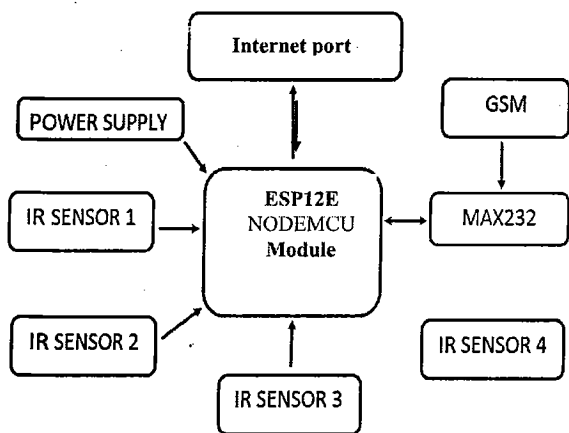


Fig 2: Bus/truck-Stand Platform Side

IR sensors: Long range Sharp 'Gp2Y0A21Yk0F, 2Y0A21 Sharp Ir Analog Distance Sensors' are used for sensing the entry or exit either passengers or goods. It may be arranged in such a way that it can identify the space available in truck.

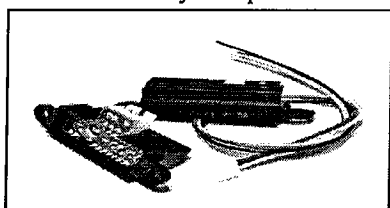


Fig 3: IR Sensors Used

GPS: The GPS module continuously transmits serial data through io pins. The latitude and longitude values of the

location are contained in the GPGGA sentence in the form of NMEA format. To send data three signals are required to be interfaced which are named as RXD, TXD, and GND with ESP12E NODMCU.

GSM: The GSM module can send or receive SMS between the microcontroller and mobile phone. To communicate, three basic signals named as RXD, TXD, and GND are used. GSM modem is interfaced with NODEMCU for SMS control.

IR sensors: IR sensors are used for counting of the persons/space present in the bus/truck. It is also used for counting the vacant positions of the platform on Bus/truck platform side module.

CLOUD COMPUTING: If the volume of transportation is more (if more than 1000 vehicles), there will be more platforms and more data storage is required. And so the management of this system is becoming so complex. This problem will then become the big data problem. To overcome this problem, ThingSpeak cloud is used to effectively storage of 'Vacant Platforms Database' and it also may display the received data properly. On a single cloud, multiple city platform databases can be stored. All these databases can be easily modified using the ThingSpeak desktop through assigned different entry point. 'Database of All Day Schedule of All Vehicles' for different cities bus stands is designed on cloud. For real time computing the data, MATLAB interface with the ThingSprak cloud is used using code1 and code2. MATLAB code1 is having access to the 'Database of All Day Schedule of All Vehicles' for different cities bus stands. If enquiry is received by the particular vehicle, it is entered into the 'Enquiring Vehicle Database'. Its scheduled limit is 1st calculated by using MATLAB programming. Its enquiring station's platform vacant status is them analysed and the vacant platform is accordingly assigned to enquiring vehicle. 'Assigned Platform Database' is also maintained. The assigned message is then send to both the corresponding Bus/truck-station module and enquiring In-Bus/truck module through internet connectivity for further processing.

'User Enquiry Databases' are also managed on cloud. It is used by MATLAB code2 against enquiry of schedule/location/vacant seats or space from user. This enquiry has to be send through the corresponding BUS/truck-stand module.

According to the priority; the different databases are rearranged and assigned for processing through MATLAB codes. Two MATLAB codes are used for processing the two types of enquiries from users as 1st for vacant platform enquiry and 2nd for enquiry from user for asking schedule, for location and for vacant seats/space.

Algorithm for MATLAB code1 used for cloud computing specifically for vacant platform enquiry is as follows.

- 1) Get the enquiring vehicle number from platform enquiry database.
- 2) Search it weather it is available in registered numbers.
- 3) If it is not registered vehicle, rejects.
- 4) If it is registered vehicle, it searches it in its schedule database.
- 5) If its duration between scheduled time and arrival time is in limit of 1 hour, then immediately checks for vacant platforms from asked station database.
- 6) It assigns the free platform to the enquiring vehicle

and maintains assigned vehicle databases.

- 7) Sends the message of assignment to both the corresponding Bus/truck-station module and enquiring In-Bus/truck module through internet connectivity for further processing.
- 8) After receiving vacant status from different platforms from various cities, modifies both the vacant platform database and assigned platform database. Deletes the entry of enquiring vehicle number from platform enquiry database.
- 9) Repeats the step 1) to step 8) for next enquiry.

Algorithm for MATLAB code2 used for cloud computing specifically for enquiry from user for asking schedule, for location and for vacant seats/space is as follows.

- 1) Get the entry from user enquiry database1 for asking schedule, for location and for vacant seats/space.
- 2) Get the schedule of enquiring vehicle from 'Database of All Day Schedule of All Vehicles'.
- 3) Send the information to enquiring Bus/truck-stand module (in terms of enquiring user number, enquired vehicle number and its scheduled time).
- 4) Get the entry from user enquiry database2 for asking schedule, for location and for vacant seats/space by the entry of destination and current course.
- 5) Analyses the schedule from 'Database of All Day Schedule of All Vehicles' for recently scheduled two vehicles.
- 6) Get the schedule time of recently scheduled two vehicles.
- 7) Send the information to enquiring Bus/truck-stand module (in terms of enquiring user number, enquired vehicle numbers and its scheduled times).
- 8) Repeats the steps from 1) to 7) for new entries.

MOBILE APP FOR USERS: Android app is designed (using app inventor2) for users to send the enquiry by sending SMS to enquiry number of particular Bus/truck-stand module for asking location of particular bus/truck by vehicle number or by the destination of recently arriving vehicle like bus or truck going to destination say Mumbai at station Nagpur. This app sends the enquiry to the corresponding Bus/truck-stand module through SMS. Bus/truck-stand module diverts the enquiry to cloud by the entry to user enquiry databases by two ways as 1st through vehicle number (in terms of 'User Enquiry Database1' as enquiring phone number and enquired vehicle number) or through destination and source station code (in terms of 'User Enquiry Database2' as enquiring phone number and enquired station codes). Cloud computing MATLAB code2 updates the enquiry result database with the resent vehicle number or given vehicle number with its scheduled time and send the data to enquiring Bus/truck-stand module (in terms of enquiring user number, enquired vehicle number and its scheduled time). The Bus/truck-stand module sends the enquiry to the corresponding In-Bus/truck module for location and vacant seats/space. In-Bus/truck module replied the detailed data to Bus/truck-stand module. It diverts the information to user app.

IV. EXPERIMENTAL RESULTS

By using this system, waiting time of the passenger/goods transportation is well reduced as well as it helps to manage arrival and departure of bus/trucks by avoiding unwanted

traffic jam. According to the priority the platform may be assigned to bus/trucks if want to access at a time.

In-Bus/truck Module: In-Bus/truck Module (Fig 4) counts the total number of passengers available or space available by using IR sensors. Counting the number of persons entered or exit in bus is possible by sensing the pulses from IR sensor. The space available in truck is also possible to identify by using distance measuring capability of IR sensors. Collected data from IR sensors are saved in data base in real time mode. If a message is received from bus/truck-stand module or from passenger regarding to the bus/truck location or vacant position/space in the bus/truck then the system will automatically replies to passenger/person through message. Also when driver needs information regarding to the vacant platform at the time of driving, In-bus/truck model sends the message to bus/truck-stand model. After receiving message from bus/truck-stand model, driver parks bus/truck in specified place and same information of bus/truck location is automatically announced by the system to the passengers or concerns.

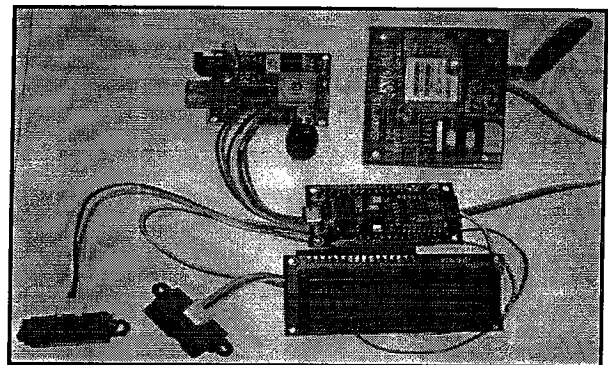


Fig 4: In-Bus/truck Module

Bus/truck-stand module: This module is shown in Fig 5. In this module, ESP2E module is interfaced with array of IR sensors and with GSM and power supply. Bus/truck-stand module counts the vacant platform number continuously in real time mode if the bus/truck stand module receives the message from the bus/truck driver or from in-bus/truck module then system will automatically replies to message received regarding vacant platform. Means the bus/truck stand module monitors the in bus/truck module. GPS module is also interfaced to this module to identify the location of various platforms.

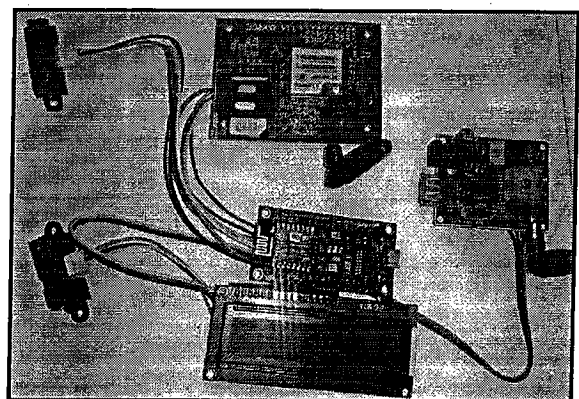


Fig 5: Bus/truck-stand Module

Initialization of the system is shown in Fig 6 when the power supply is switched on. The system will automatically collect the information regarding all the scheduled bus/truck's location through longitude and latitude.

It shows the message on 16*2 LCD display like "GSM modem connected" and "Bus/truck transport system". It also shows that "The system is initialized". And starts working and processing as per specified protocol.

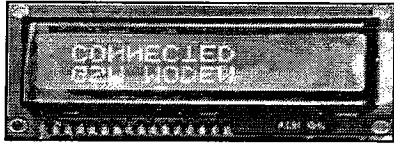


Fig 6: Initialization of GSM & GPS

As shown in Fig 7, the passengers or vacant space are calculated and information is displayed on 16*2 LCD display. P shows the total number of passengers or vacant count available in bus/truck.

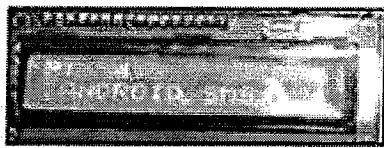


Fig 7: Display Number of passengers entered and exits or vacant space count

Fig 8 shows the enquiry message that passenger or user has to send in format like "MH 25 8031" to enquire the bus/truck details by using his mobile to enquiry phone. This enquiry message is sent from passenger or user to In-bus/truck module. By getting this message, the information corresponding to bus/truck number, bus/truck location and vacant seat/vacant space are reverted back. Similarly user can send enquiry through user app designed especially for android mobiles.

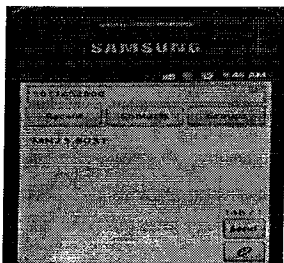


Fig 8: Enquiry sent by passenger/concern for bus/truck location & seat/space available in the bus/truck via phone

Fig 9 shows the received enquiry message for bus/truck location and vacant seat/space reading process and displays the message on 16*2 LCD display on display board.

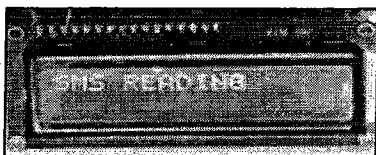


Fig 9: System received inquiry about bus/truck location & seat/space available in the bus/truck

The system will automatically receive the message from concern person (Fig 9) and replies to enquiry message by sending back bus/truck location and vacant seat/space (Fig 10).



Fig 10: Sending reply for inquiry with bus/truck location & seat/space available

Fig 11 shows the message replied as a result of enquiry message. Reply message contains the bus/truck location, passenger/space count and Bus/truck Number.

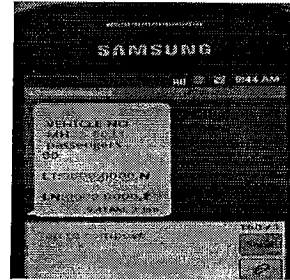


Fig 11: Reply containing bus/truck location & seat/space available

Driver has to press the PUSH button for the enquiry of vacant platform. After getting information regarding vacant platform, driver may park at located platform. System continuous collects the information of vacant platforms after receiving enquiry from the driver side module. After collecting information, bus/truck-stand module sends (Fig 12) the vacant platform information to In-bus/truck module.



Fig 12: Sending Platform status via GSM to In-bus/truck Module

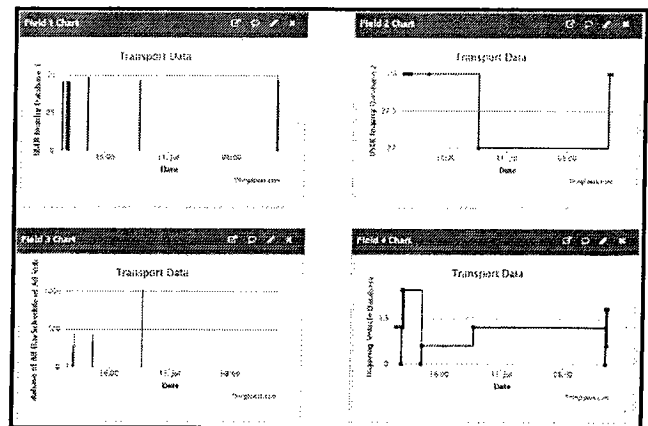


Fig 13: ThingSpeak databases

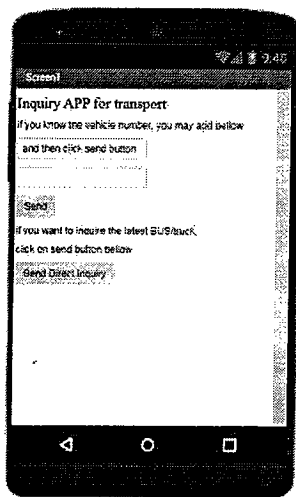


Fig 14. Mobile app for User

Fig 12 shows the process of sending a message to the in-bus/truck module which is nothing but the replay to the enquiry message about vacant platform. ThingSprak database for 'User Enquiry Database1' is shown in Fig 13. Front view of android app that is designed with App Inventor2 for user enquiry is shown in Fig 14.

V. CONCLUSION

Smart Monitoring and Control of Bus Stand and Transport System Activity is successfully implemented and tested. Bus/truck-stand module monitors the bus/truck stand traffic and reduces waiting time of passenger. Proposed system provides the information regarding real time location of bus/truck, longitude and latitude of bus/truck as well as available seats in the bus or vacant space in truck. This system also guides bus/truck stand management/controller by providing information regarding bus/truck location, vacant platform, and available seats/space in the bus/truck. Propose system is more efficient and cost effective and also possible to implement commercially. Tracking system is getting more important in large places and it is more suitable than other systems. It was successfully integrated and because of it, it is possible to track multiple bus/trucks anytime from anywhere. It has real time capability, this system has many advantages such as minimum operation costs, effective/ strong expandability and easy to use in vehicle tracking and bus/truck stand management.

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Design and Development of Low Cost Humanoid Robot with Thermal Temperature Scanner for COVID-19 Virus Preliminary Identification



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ABSTRACT

Very important and initial challenge in the epidemic of Covid-19 is to identify more probable patients out of crowd of people. Once identified, probable patients may be sent for more Covid-19 test for identification. This initial challenge is tickled by using thermal imaging with the use of thermal cameras over the entire world. It requires the manual operation for scanning of people. It is so risky for human being that handles the whole operation of scanning. Humanoid robot is designed for instructing, alerting and scanning of entering peoples for the sake of more prevention from Corona virus. Low cost humanoid robot is designed using Girl Mannequin plastic body. Hand and neck mechanism is developed using 2-axis Motion Mechanism. All the corresponding motions are modelled for particular action for scanning of person in front of it. Activation of data capturing and scanning schedule is initiated once entry of person is identified using PIR proximity sensor. Temperature data recorded is analysed and decision is taken place by opening and non-opening of entry gate. Buzzer, voice indication with SMS alert is given by robot for further action if scanned data is found abnormal. Whole Robot system is implemented and is tested for real time operation. It is found working satisfactorily.

Key Words- COVID-19, Humanoid Robot, Thermal Scanner, Raspberry Pi, Arduino, Motion Modelling.

1. INTRODUCTION

COVID-19 is a major epidemic that was spread over the entire World. Automation and less human assisting systems are required for controlling the viral effect of this disease. Manual assistance required for scanning is needed to be avoided.

Thermo-graphic scanning is a proven technology based on infrared imaging used in a wide range of applications like monitoring, diagnosis of industrial machines and products and diagnosis of health [1], [2]. Many thermal cameras like ARBOR SENSOR SYSTEM [3], FLIR [4], SATIR [5], FLUKE [6], etc are available in market having different

resolutions, features. Some thermal cameras are having the facility of data communication using Ethernet port [3] and some models of FLIR [4] like FLIR E5 [7] and FLIR E8 [7] are having wifi facility for capturing and getting the information.

Since 1985, thermal imaging devices are used for fever detection by Walter T. Hughes [8]. He stated that the most accurate readings were got along the area near eye and E spot- area below the ear lobes. Later based on many clinical studies[9-12] recommendation through different publications of ISO[13], IEC[14] and the reviews of CDC[15], the best area to scan a person's body temperature is the inner portion closest to the nose where your tear ducts called eye's Lacrimal Caruncle area and the hole of ear. Some of the researchers also recommended to average the temperatures over large area of face or along fore head. Some major companies like Amazon and Walmart are scanning temperatures of their employee with handheld thermometer. Scanner must be close enough to the people for checking that may lead to infection [16]. With a thermal camera, thermal scan is possible automatically.

The proposed system may solve the defined problem in most of the extent. Proposed system includes Humanoid Robot System having major three capabilities as 1) instructional capability, 2) movement capability and 3) decision making capability. System also includes Entry Gate System that is designed for sensing by three ways as 1) sensing of the person entering into the gate, 2) sensing the exact head position and 3) sensing the height of the entered person. Data is sent from Entry Gate System to Humanoid Robot System through wifi connectivity using ESP 01 module. Third major sub-system of proposed system is Face Rotation Identification Algorithm using Machine Learning (FRI-ML) that identifies the rotational angle of entered person for proper scanning.

Positional information has to be captured by Entry Gate System when a person is entered for scanning. It requires various sensors like 1) PIR sensor for entry detection, 2) number of ultrasonic transmitter and receiver pairs for





Design of Drone3dContour: A Novel Contouring System using Altitude Measurement and Cloud-Web Computing

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ABSTRACT

3D modelling of land survey is necessary for various geographical applications like surveying, levelling and geographic analysis. Traditional method for contouring using dumpy level is a measurement of altitude with reference of a reference point that requires manual measurement and provides accuracy of 0.17 m. This method is time consuming to perform the manual process for more number of points of survey. Manual errors may be introduced in this method. The quick altitude measurement and 2D & 3D contour formation method is required to be developed for accurate analysis. A novel method for altitude measurement is proposed using controlled drone that scans the specified area in pre-defined manner and measures the corresponding altitudes of drone from the earth surface points to calculate the altitudes of every earth surface point with reference to the initial reference point. The altitude data of the specified earth surface points are send to cloud for storage and computing purpose. Cloud computing is performed for 2D & 3D contour formation using MATLAB cloud computing functions. Final information is displayed on web site and can be accessed remotely from anywhere through proper authentication.

Key words: Drone Control, Altitude measurement, 2D & 3D contour, Cloud computing, web-server

1. INTRODUCTION

Contour lines (isolines) visualize surfaces of continuous levelling information as curved lines that joining all the points of equal altitude. Contour lines are depict lines having constant altitude/elevation and are always used to display various parameters such as air quality, population density, air pressure or weather maps. Land levelling plays major role in modern infrastructural development. It requires the 2D contour formation and 3D modelling of land to be surveyed. Information about altitudes corresponding to the locations along specified number of land points is required to create the contour.

From 1950s, there was in use a very tedious procedure and more complicated normal contouring technique [1].

Modern cartographic [2] and GIS software packages [3] were mostly used but they lack in quickly and easily creating customized contour lines. GIS and image-editing software [4] is a time-consuming and multi-step process. Various modern tools like GMT (Generic Mapping Tools) [5], LASTools [6], NCAR Graphics Software Package [7] were developed for contour formation. All these tools require geographic and Cartesian data sets for contour formation. Data manipulation like filtering, trend fitting, gridding, projecting, etc can be performed by open source GMT [5]. It is a collection of tools of 80 basic command lines and 40 more specialized and discipline-specific tools. Through it, it can produce various forms of contours like simple x-y plots by contour maps, artificially illuminated layered surfaces and 3D views. It can also perform over 30 map projections and transformations. Visualization of GSHHG coastlines, political boundaries, and rivers map is also possible using GMT. Along with contouring, LASTools [6] can perform accessing of LIDAR data from and/to compressed LAZ and standard LAS file and can also converts ASCII from/to Shapefiles. Various operations like viewing, filtering, thinning, merging, DEM rasterizing, TIN triangulating, and creation of boundary polygon were possible using this tool. NCAR Graphics software [7] was developed by Fortran and C for different operations like Contour plots, XY plots, Surfaces/iso-surfaces maps, Streamline plots, Triangular meshes, Vector plots, Weather maps and Histograms.

Controlled drone based contour formation is a novel approach for surveying purpose. The various controlled drones like Phantom series drone, Pixhawk drone [8, 9] are already used for various geo-graphical applications. Various features of various drones [8, 9] are needed to be identified for its proper selection in particular application.

We used MATLAB programming for creating and modelling 2D and 3D models of captured altitude data as the altitude information is proposed to be stored in cloud in this application. ThingSpeak cloud [10] is used for storage of extracted altitude information. This information is used by MATLAB programming for computing the required information like 2D contour and 3D model of land mark. The computed 2D and 3D models are then displayed on



Design and Development of IOT, Web-Server and ML-AVPR based Intelligent Humanoid Robot for Traffic Assistance

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ABSTRACT

In India, there is lack of traffic assisting persons (traffic police). They are basically engaged in various activities by authorities. Major problem facing is while traffic is switched OFF because of technical problems like battery backup, under maintenance condition or many more. To overcome these problems, the intelligent traffic assisting robot can be used at the square of traffic signal. When power ON, it will act as intelligent monitoring and alerting system. When traffic signal goes OFF, it will take control of signal rotating with its basic task of intelligent monitoring and alerting. Humanoid robot is designed with low power devices that takes very less power than that of required for signal operation at the time of mains power OFF. By same propose system, both manual traffic like control (by robot) and signalling control may be performed at a time if required. Intelligence required in the proposed system is for identifying specific instance as traffic breaking. Various instances may be monitored using back end program designed. But here, traffic breaking is discussed in details. With traffic breaking instance, intelligent algorithms perform tasks as identifications of traffic breaking vehicle, driver and recognition of number plate for assigning fines to particular. It is performed using machine learning model called ML-AVPR Algorithm. A novel approach for image segmentation of vehicle area, driver area and licence plate area is proposed for better analysis through Machine Learning algorithm. The segmented images are given as input to the Machine learning algorithm that identifies various required parameters in real time manner. The results are satisfactory and appeared in real time sense.

Key words: Intelligence Traffic Sensing, Humanoid Robot, Machine Learning, Web-Server.

1. INTRODUCTION

Many traffic controlling, monitoring systems were developed by many researchers [1]. According to the survey in USA, traffic signal breaking between 1997 and 2004 was about 51% of total traffic [2] so need is to control it by the means of intelligence system. In 2015, the words first digital intelligent road was developed in Germany that used road

side units and vehicle side unit for inter-communication of specific information about traffic and many more [3] that leads reducing number of accidents, traffic congestions and carbon emissions etc.

During 2016-2017, Autonomous vehicles were designed based on the intelligent transportation system. This vehicle autonomously followed all the traffic rules [4]. Adaptive timing controlled traffic signals based on the volume of traffic along the specific way was developed to handle the demand of real time traffic control and to handle the traffic congestion in cities and metro cities [5]. Mostly the timing for signal rotation is predefined with proper sequence. It becomes inefficient in the case of odd density of traffic, this leads to increasing in waiting time and signal jams [6]. Similar systems were developed before but not able to improve the behaviour of driver [7]. Similar work latter also reported the varying behaviour of drivers [8], but because of worst situation of traffic around all the metro cities, it was suggested to have intelligent solutions. Same system was then modified for the inclusion of more information about vehicle surrounding into the in vehicle unit [9]. Later on, in vehicle unit's simulators called Simulation of Unity 3D [10], Urban Mobility (SUMO) [11], and City Engine [12] were developed to analyze the traffic of city. All these intelligent systems are useful to metro cities but not feasible to towns and big villages as it may be useful for costlier vehicles. With smart city developments, it is needed to think about growing smart towns and smart villages. So, specific systems applicable to cost effective vehicles is needed to be developed. Intelligent observing eye is required to be developed for real time monitoring, real time analysis and real time alerting.

A combined traffic controlling, monitoring, alerting and real time performing system is needed to be developed yet that are compatible for various instances like signal breaking, vehicle tracking with less information (only by colour of vehicle or only by name or only by number etc).

Intelligent traffic control is a today's need for all smart cities, growing cities and even small towns for monitoring to proper security. Security on square of traffic signal is more important as it may be generally inlet and outlet to most of the cities and towns. So, real time monitoring and alerting to the particular security person is needed with exact intimation of vehicle. This information may be about traffic signal



Online Rpi-Web-Server based Blood Cell Analysis for Fast Diagnosis and Monitoring of Disorders for Remote Stations

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ABSTRACT

Government of India had already undertaken various steps for developing health care stations at villages and remote places. But it is not possible to provide the expert physicians and doctors at these places. Government had appointed care takers and nurses at these places. In case of any emergency, proper care may not be possible in proper way. Some remote monitoring systems that can be used for remote assistance may be developed. Experts may remotely analyze the defined problems and may immediately suggest the solution that may be responsible to the saving of one's life. We have developed a system that can perform the WBCs, RBCs and platelets count from the blood sample taken by caretakers. The microscopic images of blood sample are captured and then they are stitched using novel approach of Hybrid Ero-Dilation based circular stitching and processed for counting cells automatically with this system designed with Raspberry Pi. The results and samples are stored in to the system and can be remotely accessed with embedded web server. Embedded web-server is designed for the counting of WBC available in blood sample based on image processing. MATLAB code is designed and called into python for the execution with Raspberry pi processor. Web-server is designed and embedded into the Raspberry pi processor for accessing remotely from outside worlds.

Key words- Raspberry pi, embedded web-server, WBC, Classification, MATLAB to python.

1. INTRODUCTION

World health organization (WHO) has facing a challenges for getting and keeping health workers are rural and remote areas. The Ministry of Rural Development of the Government of India initiated the task of accelerating the social and economic development of rural India. Its focus is many on health with education, drinking water, housing and roads. Health issues are the major issues in remote places. Indian health ministry also initiated the steps towards the development of many health related techniques.

Available Remote monitoring systems mostly included blood pressure monitoring [1][2][3] It also included blood oxygen saturation monitoring [4][5] and blood glucose monitoring [6][7]. Remotely monitoring and counting of White Blood Cells (WBCs), Red Blood Cells (RBCs) and platelets are considered here as it requires frequently to be observed for diagnosis of many diseases.

Many doctors and many pathologists identify this problem. In the current era of automation, it becomes necessary to provide software-based solution to almost all problems. For the hematologist, subjective interpretation of blood smear become more difficult due to some ambiguity of cells, or due to traditional methods [8][9]. Assessment of blood smear also suffers from tiredness and capability of performing repetitive task of observing through microscope. May one of these reason attracted researchers towards computer aided procedures. Computer aided analysis of blood cells improves objectivity and reproducibility.

Large view microscopic tumor and blood cell structure analysis is required to identify the various diseases like cancer, 'rouleaux' formation, leukemia, malaria, psoriasis, AIDS and many more. Microscopic Video Mosaic Creation [10][11] and Mosaic Video Creation [12] (both the terms are different) are necessary to perform various medical related works. In medical field, mosaic can be used for thermo-graphic cancer cell/tumor identification in which thermal cameras can be used to create large view of human body to be projected [13].

A novel automated technique for providing a remote assistance for the analysis of blood sample is developed. It required making blood sample slide for microscopic visualization by the caretaker properly. The blood sample slide is required to be scanned by the proposed system for further automatic analysis. The proposed automatic system includes an Electronic Microscopic System (Bluetooth connected) that can capture the image of blood sample at 10X, 40X and 100X magnification. Microscope is slightly tuned to capture surrounding images i.e. connected overlapped microscopic images. Captured images are sent to the Raspberry pi based Controlling System using Bluetooth communication. The sample images are processed using python code for stitching of overlapped microscopic images. The stitched image (mosaic image) is cropped based on the predefined unit scale or size so that number of WBC can be identified, and counted per unit sized sample. After cropping to the specific size of mosaic image, the WBC areas are identified and separated from RBC and platelets area. Identified WBC areas are then classified according to its different types. The same data is stored in to the database maintained into its memory in terms of number of WBC for specific class. The web page is designed for monitoring and visualization of the captured data. This web page is embedded into the web-server [14] developed into the flash memory of Raspberry pi board. IP of web-server Ethernet is mapped to external IP for accessing through internet using specified port. For the expert opinion, SMS will be sent to the expert for further immediate assistant.



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Symbolic-OTP Based Security System for Domestic Use

Kantilal P Rane

Abstract- Security is worldwide problem about which researchers are continuously working about. Security is most important aspect that is gaining nowadays. Previous research related with traditional secure locking system includes the systems those are based on hardware like many sensors, GSM, microcontroller, GPS systems etc. It also includes software like MATLAB, EAGAL, PROTEUS, java and .net etc. Biometric systems mostly used are iris recognition, face recognition, password, RFID and Smart Card based authentication etc. They are having their own advantages and disadvantages. Symbolic-OTP Based Security System is proposed to overcome the various drawbacks of various security systems. It is having typical structures as a digital and mechanical door-locking based security. This system is automatic system without any human assistance. It requires to be registered for the authentication using symbolic-OTP. Proposed system will acts as server for all users. It includes camera scanner attached to the door for scanning the symbol-OTP that randomly generated. When user wants to open the security, he has to send the request for Symbolic-OTP. Symbolic-OTP will be send by the system to user, mobile through Email or through its mobile app. Mobile symbol has to be scanned by camera in front of gate. Once the symbolic-OTP is matched by the system door latch gets opens. In case if the OTP is not received or mobile doesn't work then there is an option to open the latch by answering the security question that is asked by the system or by master key. Most of the problems of traditional latching system can be overcome by the proposed system. System also includes proximity sensor to identify the motion of the person in front of the door. The camera here attached also may take snap of the person coming in front of the door on account of highest security.

Key words- Symbolic-OTP, Latching Security, Door Lock system, Raspberry Pi, Camera, PIR Sensor, Alarm system.

1. INTRODUCTION

Security is defined as the means of safety and protection of property, assets and life. By preventing unauthorized entry, security system ensures the safety of things and human life [2]. It is needed to focus on the door lock security with the use of latest technology as traditional mechanical lock security is easily broken in most of the robberies and crimes. So, it is decided to develop the invisible lock with security camera application.

The proposed system is designed and developed that uses existing security camera that are mounted over the door that works on sensing of symbolic-OTP. Modern door lock system includes RF ID card, Smart card based authentication may be cloned for breaking the system. One time disposable authentication mechanisms [3] are more reliable than these systems. This mechanism uses OTP with IOT devices using Raspberry Pi processor [5].

The earliest security systems were generally expensive very hard to monitor, for some systems man power is required and some are time consumed. In traditional intruder alarm system, the amount of alerts becomes unmanageable [4]; as a result, it is difficult to understand by user. Some are password based in which it was found that there may be possibilities of leaking or hacking of password. Some require internet connection due to this it may be complicated and expensive and also possibilities of internet range problem. Biometric identification technique may lead to some problems like in iris, palmtop recognition it may fail due to some structures. In this biometric identification fixed

position image is necessary and if the image will not positioned properly then it will lead to error.

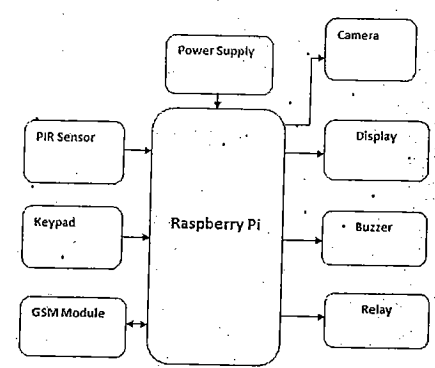
2. PROPOSED METHODOLOGY

System includes IOT device using Raspberry Pi processor. Different supporting devices like PIR sensor, Camera, Keyboard, GSM module, buzzer and display are interfaced for the complete operation of the system.

This system is the next step to the existing password protected security systems because it includes special feature of Symbolic-OTP. It is a password that can be valid for only once for authentication purpose. The Symbolic-OTP will be send by system for authentication through h SMS or through specific App designed for it. MIT App Inventor2 is used for designing the mobile App for user.

2.1. Block Diagram

Interfacing diagram of the proposed system is shown Fig. 1.



Design of Issuing and Self-returning Modules for Library Books for Mega Campus by using ARM 7 Web-Server and Cloud

Kantilal P Rane

Abstract- In mega Universities, Colleges and Hostels, there are mega libraries and located at long distances. It is very difficult to always approach to distance libraries to all the students for accession of books. To get the hostel room delivery of particular books, app like Amazon is designed. The Issuing Module is designed for delivery of book by delivery boy. To submit the books without wasting more time, multiple Self-returning modules are designed through which one can submit his/her books at any corner of the campus. Students may submit their books at any returning module nearby available in the campus. Cloud connected returning modules are designed that gets and sends the information to cloud through internet. Students can get acknowledgement on the App assigned to them regarding to the transactions of the books immediately through Web-server in module itself. Issuing Model is designed based on NFC RFID technology. A specific android App is designed for Issuing Model that accesses the RFID information of students books and authenticates through Cloud. It is also responsible for issuing the book and sending notification to user. Library Console based on .net platform is used as a supporting technology for proposed system. The whole system is working satisfactorily with the use of various cloud databases.

Key Index- Library Automation, ARM 7, Cloud, Web-Server, App design

1. INTRODUCTION

For big campuses like Universities, Colleges and Hostels, there are very big libraries available at long distances. Students are always facing problem of approaching to distance libraries for accessing the books. They are also facing problems of long queue in issuing and submitting counters. So to overcome the problem, outdoor units are proposed to use in campus of educational institutes. It is proposed to use hostel room delivery of particular books through delivery boy (may be paid service). For accessing this facility app like Amazon can be designed through which students can check the all the book stacking in library and also can observe the available book at any instant. Student can issue the book online so that he may get it on predefined time at his hostel room location. Once the order is placed for issuing the book, the library console will give them confirmation of issuing books through notification on students App. Delivery boy picks the books from central library and as per the student's location and address, he drops the books at specified room on predefined time. He has to carry the issuing Model with him. The Issuing Module is basically designed for delivery of book through delivery boy. Students Id, books Id can be scanned using Issuing Model for authentication, and then the book is delivered to student at his location. Notification is send by Issuing Module for confirmation of book delivery. The information is then sent to cloud for updating the corresponding information.

Multiple Self-returning modules are designed to return the books without wasting more time through which one can submit the books at any corner of the campus one by one. At

any nearly module students can submit his book in campus. Self-returning modules are designed that accesses the information to cloud through internet. Students may be issued notification on the App regarding to the transactions of the books immediately through Web-server. Web-server is embedded in to the module itself for immediate response. To submit the book into the Self-receiving module, RFID cards are used. After proper authentication through RFID card, students can submit the book into the returning module. Immediately after the transaction, data on cloud is updated. This data is accessible to librarian and administrator for getting record. Mobile App is designed for the students for sending issue request for the delivery at their hostel room at predefined time. This app also visualizes the books entry immediately after transaction. ARM 7 Microcontroller is used as a heart of proposed returning module. It is configured with various electronic modules like ESP 01 WIFI module, RFID module, touch screen and display module and mechanism module etc for proper submission of books. Student has to submit book one by one at a time. Web-server is incorporated into the ARM 7 for easily monitor the recent transaction through App. ThingSpeak cloud is used for data storage of whole library. MATLAB cloud computing module interfaced to ThingSpeak is used for making tally of all the transactions of whole library books. Time limit to submit the book is also calculated by the MATLAB cloud computing module. Requested data for student's App is also taken from cloud databases. Student android App is designed using APP Inventor2.



A Novel Method for Feature Extraction using Color Layout Descriptor (CLD) and Edge histogram Descriptor (EHD)

Pradnya Vikhar, Kantilal Rane, Bupendra Chaudhari

Abstract: Now days, Image processing finds diversified applications in almost all field of life. The success of any image processing application is depends on proper feature extraction technique. To extract good and proper features is very interesting and challenging task in the development process. It is used to describe the image based on its contents. These extracted features are used to compare, analyse and/or search the analogous images. There are various feature extraction techniques are found in the literature to design various applications. However any image processing application generates images with high dimensionality, which will be results in the low efficiency of an application.

This paper provides an approach to extract features from the images using MPEG-7 feature extraction techniques. The approach discussed in the paper uses two popular MPEG-7 visual content descriptors; they are namely Edge Histogram Descriptor (EHD) and Color Layout Descriptor (CLD). The concept results in reduction of dimensions of an image to improve the efficiency of the application. It can be used as a heart to design any image processing application as well as provides strong foundation to develop variety of applications.

Keywords: Image processing, Feature extraction, low level features, semantic features, MPEG-7, dimension reduction, CLD, EHD.

I. INTRODUCTION

Feature extraction is a technique to represent an image based on the contents of an image. It is referred as the first and most important step in any image processing application [1][2]. The result and accuracy of an application is based on this step. Careful and proper designed of this step provides the strong foundation to whole application. Two commonly used visual contents (features) are: primitive (low level) features and domain specific (high level/ semantic) features [1][2][3]. The primitive feature represents color, shape, and texture within an image while domain specific features includes for instance, finger prints, handwriting, and human faces. Domain specific features are application dependent and may comprise domain knowledge. Semantics features are obtained by either human interpretations or by complex inference procedure on primitive visual contents. It is a form of high level image description or meta-object [4][5][6].

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1.1 MPEG-7

MPEG has developed a new standard called MPEG-7, previously named as multimedia content description interface. To standardize process of searching and retrieval of images, extraction of visual information in the form of various features of images are required, thus emerges Moving Picture Experts Group -7 (MPEG-7) standards [7][8].

It contains a set of standard descriptors (to represent the features) that can be used to describe information from various types of multimedia data. The descriptions are related to the content itself which allows fast and efficient searching and retrieval of information of a user's expectation.

The MPEG-7 standard provides standard set of descriptors used to represent both audio and visual-video contents. It uses XML to store the metadata. The main focus of MPEG-7 descriptors is to standardize [8][9] –

- A set of descriptor schemas (DS) and various descriptors (D)
- The language used to describe these schemas DDL (description definition language)
- A scheme to represent coding the description

MPEG-7 has eight general parts:

1. Systems: It is used to specify the tools required to state different the descriptors.
2. Description Definition Language (DDL): DDL is responsible to specify the language which defines new schema descriptions.
3. Visual: It contains the set of descriptors which are used to recognize the visual parts of the given image/ video.
4. Audio: Audio is used to identify the descriptors which encode the audio part of the material.
5. Generic Entities and Multimedia Description Schemes (MDS): It specifies various descriptors for generic multi-media descriptors.
6. Reference Software: These are the some experimental software tools which are used to perform specific content description.
7. Conformance Testing: It provides set of guidelines for testing conformance to MPEG-7.
8. Extraction and Use of MPEG-7 Descriptions: It is used to generate information about the extraction and use of particular description tools.

Real Time Face Recognition and Tracking System with Multi-Camera Arrangement

Kantilal P Rane

Abstract: Object tracking and face reorganization has received tremendous attention in the video processing community due to its various applications in video surveillance, traffic monitoring and so on. A single camera is not capable to scan 3d view of specified space. So, we use multiple cameras, placed in different sections of the area with overlapping region in field of view (FOV). Every camera will capture the video scene of itself FOV. The system is able to track human successfully by setting up correspondence between objects captured in multiple cameras. Thus, it saves the hectic job of manual tracking. There is a search window available for each object that gives the object's trajectory. Tracking of object will be given by continuation of this process. For monitoring objects in areas like car parking, banks, hotels etc for security purpose, this system is best. Over the last couple of years, many algorithms and results have been presented for the problem of object tracking and recently the focus has been concentrated on real time person tracking with multiple cameras. Secondly, face detection is one of the best ways of identification. The main applications of automated face recognition are of biometric authentications and surveillances. Face recognition systems has become popular in biometric field as it is non intrusive and does not require the human interference. Up to that, there is no solution or technique that provides robust methods. This paper presents the detection of the face of the person, recognize and do tracking with use of multiple web cameras. Generally in daily camera security systems, cameras have been continuously remain on and large data storage is required in the system. In this real time object tracking system, Infrared sensors are used which indicates presence of person or object. Cameras will turn on only when object is detected by sensor after then the face recognition is carried out. It has capability of high speed processing and achieved low computational requirements. In similar areas, efficiency, accuracy, and speed of identification are the main tackled issues.

Keywords: HOG, multiple cameras, multiple sensors, and RGB-GRAY.

I. INTRODUCTION

Nowadays, there is growing demand of security that leads with great importance to investigate the military applications based video surveillance system. More number of surveillance cameras is installed in the areas such as banks, stations and borders. The available data makes it impracticable to guarantee watchful monitoring by human operators for long periods of time because of routine and fatigue. As a result, in the case of event suspicious activities, video feeds are mainly used for forensic measurements. To make helpful to the human operators for identification of important or suspected persons in videos, multi camera object tracking and face detection system can be used. For moving

object detection and tracking; fast, efficient and robust methods are required.

II. LITERATURE SURVEY

CCTV is the first generation in visual surveillance system which was developed in 1940's for the military use in Germany for observing the launch of V2 rockets. They used black and white monitor to view launch of rocket V2 [1]. Video surveillance was used in stores, homes and banks to secure their properties. In 1980's, this traditional CCTV system are used analog video cameras which are connected by coaxial cables to surveillance system for monitoring by operators through the cameras connected to videotape recorders. They used VCR for recording of footage and used multiplexer that allowed multiple cameras to be viewed on single monitor. In 1990's VCR were replaced with DVR with the data archived on hard drives. Then in mid 2000's, they have network connections so the video data can be stored on servers. Video servers allowed real time video capture for remotely viewing facility on smart phone, PC or Laptop. In later 2000's, an IP network system were used where the data is continuously being transmitted over the network improving quality of image and resolution. It was reported that the United Kingdom has more number of cameras per person than other country in the world [2]. Initial stage required for video analysis is moving object detection [3]. The next step in the video analysis is object tracking [4]. The final step of an "intelligent" visual surveillance system is to analyze the information obtained of the video and to identify actions in a scene.

In 1960's, initially semi-automated recognition system for facial recognition was developed to locate the various features like nose, ears, mouth and eyes on the images. In 1970s, twenty first specific markers are used by Goldstein and Harmon [5] such as hair color and thickness of lips for specific recognition. In 1988, standard linear algebra technique was developed by Kirby and Sirovich [6] for face recognition. In 2007, 2006 FRVT results was reported by NIST [7] that initially demonstrated automated face recognition system experimented as well as or better than a human faces taken with variant lighting conditions. They also showed an improvement across vendors from the FRVT 2002 results [8]. However,

the best performing systems still only achieved a false reject rate (FRR) of 1 in a 100 measured at a false accept rate of 1 in one thousand. This translates, unable to accurately identify 1% of available database but falsely identify 0.1%. These best of results were used for controlled illumination.

The main reason for poor performance is that faces have a

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Smart Monitoring and Control of Bus Stand and Goods Transport System Activity using Cloud Computing

Kantilal Rane, Pradnya Vikhar, Bupendra Chaudhari

Abstract: This work focuses on the, implementation and validation of smart public transport system as well as goods transport system based on the application of GPS (Global Positioning System) technology, GSM (Global system for mobile communication) using Cloud computing. This system has been distributed into four modules as In-Bus/truck module, Bus/truck-stand module, cloud system and user mobile apps. After initialization of In-Bus/truck module, driver gets the information regarding to the platform availability on parking zone that are assigned to it. If the platform is vacant then driver needs to park the bus/truck at said position only. The drivers may get allotted or waiting parking platform's information through SMS or on Drivers app. The GSM integrated GPS technology can also be used to get the current location of vehicles and the available vacant seats or vacant space in truck. This information will be recorded automatically by the system. IOT module ESP12E NODEMCU is used for controlling and handling whole operations by collecting the data. This system will also guide the drivers and the bus/truck stand controller to control all vacant ports based on real time operation. One In-Bus/truck module (configured along ESP12E) needs to be installed into each vehicle to be monitored. One Bus/truck-stand module has to be installed in to each platform. Cloud system is needed to collect the whole data for big public/goods transport systems for automation of 1000s of vehicles at a time. ThingSpeak cloud is used and computing is performed by MATLAB computing. For late running, on-time running and before time running vehicles, messages are automatically sent regarding to its location and vacant seats/space. And will be displayed on rolling board on platform. Passenger/user may get the correct information by sending message on his mobile from anywhere through mobile app. Mobile app is developed to perform all the task of monitoring passenger/user, and drivers.

Index Terms- GPS, GSM, Bus/truck Stand (Platform) module, Bus/truck Side Module, ESP12E, IR Sensors

I. INTRODUCTION

Transport is one of the important needs of any country. The main problem about the transportation is the waiting time due to traffic jams. The safety of all types of vehicles is a major concern so novel approach of vehicle tracking system ensures proper monitoring with their safety while travelling.

By doing comprehensive survey related to scope of bus/truck stand monitoring and control technologies available

today in India, it is found that there is big scope to develop various types of applications and improvements for bus/truck stand monitoring and for it's controlling.

Vast works has been already reported in the field of bus/truck-tracking system. But it is needed to co concentrated on some practical aspects like availability of parking zone, availability of reserved waiting zone for vehicle and awareness in public to use it. If the actual platform allotted for parking is not vacant then the driver will have to wait at waiting place or if both places are not available then drivers has to be prior intimated for speed control. Nowadays, most of the people are using mobile applications in their daily use so its today's need to work on such enterging topics. Driver app is also designed for getting message with voice assistance system during driving. Received message will be repeated until the driver simply clicks on mobile or until next message is received.

Whole operation of proposed system is performed with basis of four module 'In-Bus/truck module' (Bus/truck side module) and 'Bus/truck-stand module' (Platform side module), 'Cloud System' and 'Mobile apps'. It provides the access to real time information related to bus/truck schedules, arriving time and departure time etc through the display at bus/truck stands. Internet connectivity as well as self-service Short Messaging Service (SMS) is used for maintaining connectivity. Displaying vacant seats/space on platform in case of bus transport/truck transport truck respectively and displaying vacant platforms for bus/trucks inside the bus/truck-stand is performed by the proposed system. Number of present person in the bus or number of goods present in truck, their counting in bus/truck side and locating the vacant positions of the platforms on platform side can also be handled by the whole system.

Bus/truck tracking system is required to be installed in In-bus/truck module and bus/truck monitoring system has to be installed in bus/truck-stand module. Bus/truck stand monitoring system will display the status of number of bus/trucks likely to be approaching to bus/truck stand. Cloud computing module will collect the data about all the parking zones from Bus/truck stand module and corresponding resultant of computed data is provided to the bus/truck-stand module of asking bus/truck for handling 1000s of vehicles at a time. Good features of this system is that all the modules are configured and designed with GPS, GSM, ESP12E IOT modules and various sensors. IR sensors are used to count the entered and exit person or goods in bus/truck.

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Students Safety with Parents, Driver and Management Alerting System using Cloud Technology

Kantilal P Rane, Bhupendra Chaudhari, Pradnya Vikhar

Abstract: Main objective of proposed system is to develop a cloud based smart system for school bus/vehicles that track and monitor the student entering in to the bus and by using cloud computing, alert their parents and school administration about student entering or leaving school bus as well as about any emergency occurs. As all know that in today's fast lifestyle parents don't have more time to drop and pick their children at bus stop or school. There are number of problem occur in the society about safe transportation of children from home to school and vice versa. Parents have always tension about transportation through buses/vehicle. To avoid this problem this system is proposed. Main aim is to develop a system which is beneficial for society, reduce waiting time on the bus stop, reduce crime against student and increase the safe transportation of student from home to school and vice versa. System monitors every student get entered into the school bus. The proposed system will be definitely helpful for real time tracking of school bus. Cloud based system is designed that is configured with Raspberry Pi IOT module for fast processing and data access. This module has to be attached to every bus to capture the real time data. And the data from many buses are well managed by ThingSpeak cloud from MATHWORK. Monitoring and alerting through cloud computing.

Index Terms- Students Safety, IOT, ThingSpeak, GPS, GSM, RFID

I. INTRODUCTION

In today's fast style parents don't have time to drop their children at school. Everyday almost all the students need to move from home to school and vice versa through somewhat means of vehicles. To obtain safe transport of children is critical issue for their parents. The major problem about the school bus is the parents waiting for longtime for arrival of school bus on bus stop. To obtain the security by knowing the current location of bus in case of emergency like traffic jams and abnormal whether condition is essential for parents. The numbers of existing systems are based on GPS tacking and monitoring the location of vehicle/bus on the Google map or sending SMS about location of vehicle to the owner of vehicle, but it requires continuous observation on Google map or on specific mobile apps. To overcome all this problem,

smart tracking, monitoring and alerting system for school bus is proposed. Proposed system mainly focuses on the alerting to the parents or management in case of emergency or late approaching to school or home. The system is based on the Raspberry pi IOT microcontroller, GPS receiver, GSM module, RFID reader and passive RFID tag. Raspberry pi IOT is heart of system which will process the functioning of total system. In proposed system the tracking of school bus and monitoring student is done by GPS & RFID technology respectively and alerting to their parents and school administration is done by sending SMS about bus location and student status in the bus by using the GSM module. The goal of our system is to alert the parent just few minutes before arrival of bus to its particular stop, thus saving of their precious time by avoiding long wait for bus. To handle 1000s of such buses or vehicle, cloud based system is proposed. The data storage of proposed IOT modules is on cloud and through it only alerting is provided. Sample system is installed at Godavari School buses at Jalgaon. By undergoing this system, parents observed the sense of security by knowing the current location of bus in case of traffic jam.

In 2012, V. Venkatakishnan et. al. developed ticketing and monitoring system for Public transportation that included ZIGBEE, GPS, RFID and GSM for integration of system. For ticketing, RFID was used and for counting entries and exits, IR sensors were used [1]. Another one system called Smart on board public information system was fixed GPS, GSM/GPRS and microcontroller module on bus. Information about present and next station was informed by comparing the GPS information and scheduled coordinates on display on bus stand. Ideal time of vehicle is decreased and was reported by central office [2]. Abid Khan et. al. had proposed the tracking system using GPS and GSM. Single board embedded system was used with GPS and GSM. The vehicle location was reported by SMS message. The main advantage of the system was totally integrated so that once it was implemented on vehicle then it is easy to track vehicle at any time [3].

The intelligent bus systems develop for campus bus identification monitoring and management system using RFID and sensing technologies. The system reduces manpower significantly. Bus drivers would also be more punctual to the bus schedules that have been established. The integrated technology used in the system was suitable to monitor and manage vehicle transportation system [4]. In 2013, J. Saranya et.al. proposed the system which focused on implementing children tracking system on android terminal for every child attending in the school. Child's movements were tracked in and out of school was possible using this

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Diabetic Retinopathy Detection and Grading Using Machine Learning

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ABSTRACT

Diabetic Retinopathy (DR) is a constantly deteriorating disease, being one of the leading causes of vision impairment and blindness. Subtle distinction among different grades and existence of many significant small features make the task of recognition very challenging. In addition, the present approach of retinopathy detection is a very laborious and time-intensive task, which heavily relies on the skill of a physician. Automated detection of diabetic retinopathy is essential to tackle these problems. Early-stage detection of diabetic retinopathy is also very important for diagnosis, which can prevent blindness with proper treatment. In this paper, we developed a novel system which performs the early-stage detection by identifying all microaneurysms (MAs), the first signs of DR, along with correctly assigning labels to retinal fundus images which are graded into five categories. We have tested our system on the largest publicly available IDRiD diabetic retinopathy dataset, and achieved 77.85% accuracy with Gabor features and Naïve Bayes Classification.

Key words: Diabetic Retinopathy, Gabor features. Naïve Bayes

1. INTRODUCTION

The purpose of this paper is to directly compare the methods developed for automatic image grading of Diabetic Retinopathy (DR) and Diabetic Macular Edema (DME). One of the common diseases all over the world is diabetes in which the lack of insulin causes high blood sugar in humans. Long-term diabetes also affects the human retina resulting in a condition known as diabetic retinopathy (DR). This condition damages the retinal blood vessels causing them to leak which ultimately leads to blindness. The patients of different types of diabetes develop some form of retinopathy after 20 years of this chronic disease. DR of any stage develops in nearly all of the patients having diabetes of type 1 and about 60% of the patients with diabetes of type 2 [1]. The percentage of diabetes patients is high in almost every region of the world especially in industrialized countries which makes a high chance of DR sufferers.

There are several stages of DR such as non proliferative DR (NPDR), proliferative DR (PDR) and maculopathy or

macular edema (ME). NPDR is known as background DR, whereas PDR and ME are the advance stages of DR [1]. Diabetic patient can have different signs of retinopathy such as microaneurysms, hard exudates, hemorrhage and cotton wool spots (CWS) at different stages of DR. Microaneurysms are weak dark red spots developed on blood vessels that bulge outward. They are the first detectable change in the retina due to diabetic retinopathy. Hemorrhage is usually round or oval in shape and formed by the rupture of micro aneurysms. They are also dark red in colour and can be located within the mid-retina. Hard exudates and CWS are collectively known as exudates. Hard exudates are yellowish deposits of protein present in the retina. CWS are the soft exudates which are white and fluffy lesions. Diabetic maculopathy or ME is a condition in which the macula is surrounded by the exudates and a patient's central vision is affected. Figure 1 shows the main component of human retina and also the exudates present on the surface of the retina.

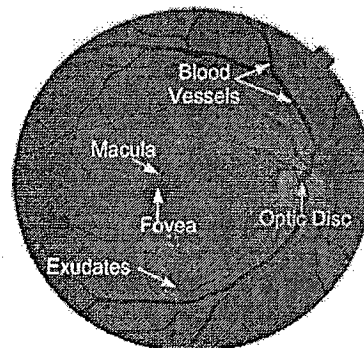


Figure 1: Main components of the human retina along with exudates

Diabetic maculopathy occurs if exudates appear on or near the macula affecting central vision. The central portion of the retina which is usually darkest and rich in cones is called the macula (Fig. 1). The macula is accountable for the clear, sharp and detailed vision [1]. The center of the macula is called fovea which is responsible for very fine details in the image (Fig. 1). The significance of detecting the macula is that it is used for the early detection of various diseases. ME is one of the common sight-threatening conditions among diabetic patients in which the fluid rich in fat leaks out of damaged blood vessels and gets deposited near the macula

Diabetic Retinopathy Detection and Grading Using Machine Learning

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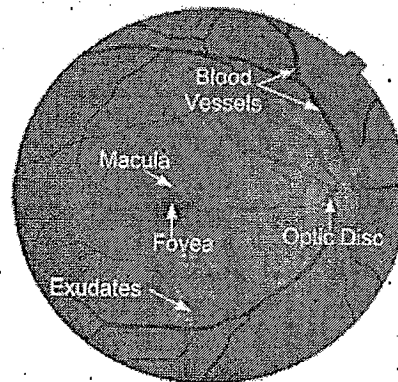


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A study on the impact of Safety Management Practices to Safety Performance among Construction Workers in India

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Abstract : India has emerged because the fastest growing major economy within the world and is predicted to be the highest three economic powers of the planet over subsequent 10-15 years. Various industries are growing at rapid pace and one of them is a construction industry. As rightly said 'greater the return, greater is the risk', accidents causing great loss of man and material are more prone to this industry. The purpose of this research paper is to assess the -impact of safety management practices towards safety performance among construction workers. There are six facets of safety management practices which are management commitment, safety training, workers' involvement in safety, safety communication and feedback, safety rules and procedures and safety promotion policies. Due to the time and resource constraints this study is restricted to construction workers in the area of Jalgaon district of Maharashtra state, India. The period of observation is also not much longer than one month which leaves the scope for future researchers.

Keywords — *safety management practices, safety performance, accident in workplace and safety dimension*

I. INTRODUCTION

This research is focused on the relationship between safety management practices and safety performance of construction workers in India. Construction industry is highly regarded as one of the main and important industries in any nation. Construction industry has many employees which are either employed to the operations or to support the operations thus increase the complexity of the accidents at work place. Occupational Safety and Health Administration (OSHA), an organization responsible for protecting worker health and safety in United States, has identified that the problems and challenges in this industry. They can be very hazardous and harmful. A few studies agree that construction sites and projects bring along high risk of occupational accidents injuries. Among industries, it are often safely said that construction sites and projects are the foremost.dangerous. . In the housing industry, workers do the various quite activities which has its very own dangers.

One of the most important implications is safety of training at industry itself and OSHA safety management practices as well. That is including such continuous change in construction project, that using a lot of material, poor housekeeping, non-continuous employment and cross seasonal work, and other pollutants like dust, noise, vibration, and direct exposure to the outside weather.

management practices i.e. management commitment, safety training, workers' involvement, safety communication and feedback, safety rule and procedure, and safety promotion policies and safety performance. Various researchers tried to hunt this relationship considering safety performance as a variable on experimental variable i. e. on various safety management facets.

a: A. Management commitment and safety performance:

It has been stated by Sadus, A.M.V (2007) that the leadership and management commitment are the foremost significant elements during this success of the security program in any organization. it's even going extreme when the writers claim that none of the weather in safety management are often executed without proper support from the management. Management commitment can include providing resources, present and consent. it's being supported by Hany et al., (2013) that the management commitment it the key think about the management of safety. The display of commitment from the management should be translated in action. Based by statement from Vredenburgh, (2002) were assumed the commitment that management are going to be giving priority is to those questions of safety and any corrective action. The management should provide reasonable safety protection, attend safety meetings or investigate and accidents or mishap at workplace where construction is that the most vital places. Other researcher ~~had~~ supported the ideas also like K.H. Han, Jimmie

II. LITERATURE REVIEW:

This study is to hunt the connection between six safety



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H and Albert P.C. Chan (2014) and Napsiah M.S and Faridah, I (2012), The workers are willing to participate in safety performance activities if the employers are concerned on their personal safety. (Ismail, Z., Omar, A. 2003).

Siddarth et al, (2008).

B. Safety Training and Safety Performance

As Vinod Kumar, M.N., Bhasi, M. (2010), stated safety training effectively identifies because the vital portion in positive accidental prevention programs. Training is one among the methods that enable workers to enhance. Training also prepares the workers to spot dangers thus learning the choices to handle things. It's important that through training, workers can increase the knowledge and skill and improve awareness, behavior and attitudes towards safety.

C. Workers' Involvement In Safety and Safety Performance

One of the foremost effective ways to stop accidents at workplace is by getting the workers involved in safety management related activities. These will promote of workers' knowledge and understanding of the inclusiveness of management practices and permit them to be a part of the system. The workers had the rights to enough information about the security within the workplace and other related information which to enable them to be participate effectively in any safety programs (S. Al Haadir and K. Panuwatwanich 2011). Thus, the attitude and behavior of workers also are the driven factors to make sure the specified of results are achieved in implementing safety practices at workplace by consistent with Vredenburg (2002).

D. Safety Communication and Feedback and Safety Performance

Safety communication and feedback are necessary to create up the regular understanding amongst business and workers on the association safety necessity and goal.

Sulastre, M.Z and Faridah, I (2012) recognized that the communication is vital that keeping people and therefore the organization working together. Safety related matters need to be constantly communicated throughout the organization. This may cause success of effective safety management procedures. Agents like supervisors and workers got to deliver communication effectively in order that the security message are often properly disseminated through the organization because the management intended. It'll encourage the security culture among the workers through sharing information and active communication assumes

E. Safety Rules and Procedures and Safety Performance

Under Safety management the foremost importance part is identifying acceptable behaviors within the organization. Safety management implementation are often one among the approaches to make sure the security rules are in situ. Inspection are often one among the good tools to possess within the workplace. By having inspection regularly, it can change workers behavior and attitude towards safety. By having inspection, unsafe conditions are often detected immediately and may be removed if the security management is well developed by the management. The activity can modify workers attention towards own safety. Employees with positive attitude towards safety won't break any safety rules and procedure and have high priorities to safety of workplace (Crucifix, M.D., 2001).

F. Safety Promotion Policies and Safety Performance

Incentive scheme like incentive rewards and recognition are often introduced as an encouragement to employees. Implementation of these will help to motivate employees to be involved in safety promotion effort and encourage employees to suits regulations. This within the end will develop more ample safety programs and system at workplace. There are a couple of factors to market safety at workplace which first, the workers should have adequate knowledge about safety, and second, the workplace is encouraging for working safety as defined by Soltanzadeh A, Mohammadfam I, Moghimbeigi A and Akbarzadeh M (2016). They added that the security promotion program will naturally encourage the organization duty on the security and worker attention to work-related injury.

III. OBJECTIVE OF STUDY:

The main aim of this paper is to study how the various facets of safety management going to affect the safety performance in construction industry in Jalgaon district of Maharashtra state in India.

IV. Research Methodology

The data collection is that the process of gathering and measuring information on targeted variables in a longtime manner.

In this research, in order to collect the data, a survey or



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questionnaire form was given to all sample respondents as the instrument used in this research paper. 200 forms were distributed and out of which 146 responses were obtained. The questionnaire form was divided into two sections i.e. Part A and Part B. Part A contains demographic profile of sample respondent which are age, gender, position, year of service and educational background etc. Whereby, part B contains items of safety management practices and safety performance. In Part B, there are 30 statements used to obtain the responses through a Likert Scale from one (extremely disagree) until five (extremely agree). Data that was gathered, analyzed using the SPSS (Statistical Package for Social Science) software. Pearson Coefficient of Correlation was applied to show the relationship between the different safety management practices and safety performance.

V. Findings:

Table No. 1 explains the demographic analysis of the respondents, followed by Table No.2 which shows reliability analysis and correlation analysis (Table No.3).

Table No. 1
Descriptive Statistical Analysis

The study of quantitatively describing the characteristics of a group data is named descriptive statistic. Frequency analysis may be a part of descriptive statistics, it's important to run frequency checks on the info contained in those variables.

	Characteristics	Frequency	Percentage
Gender	Male	95	65%
	Female	51	35%
Age	Below 18 Yrs.	27	19%
	18 to 30 Yrs.	66	45%
	30 to 50 Yrs.	45	31%
	Above 50 Yrs.	8	5%
Education	Below Matriculation	25	17.1%
	HSC or SSC	33	22.6%
	Diploma	40	27.3%
	Degree	43	29.4%
	Masters	5	3.4%
Position	Upper Level	5	3.4%
	Middle Level	44	30%
	Lower Level	53	36.6%
	Others	44	30%
Year of Service	Less than 1 yr	61	42%
	1 to 5 yrs	37	25%
	5 to 10 yrs	28	19%
	More than 10 yrs	20	14%

Table No. 2.
Reliability Analysis

Variable	No. of Items	Cronbach Alpha
----------	--------------	----------------

Management Commitment	5	0.657
Safety Training	5	0.613
Worker's Involvement	5	0.637
Safety Communication and Feedback	5	0.528
Safety Rules and Procedures	5	0.681
Safety Promotion Policies	5	0.650
Safety Performance	5	0.793

Table 03.
Correlation Analysis

Characteristics	Correlation Coefficient with Safety Performance
Management Commitment	.486
Safety Training	.560
Worker's Involvement	.408
Safety Communication and Feedback	.422
Safety Rules and Procedures	.569
Safety Promotion Policies	.444

Table above reveals that safety management practices are able to affect the safety performance in positive manner. Based on the result, p-value are less than 0.01 ($p < 0.01$) thus objective if turned to hypothesis are supported. All the six practices directly affected safety performance. The findings are in line with previous researchers such as (Subramaniam et al, 2016; Diaz et al, 2007; Vinodkumar & Bhasi, 2010; Gillen et al, 2002; Ali et al, 2009). As confirmed by Ali et (2009) they also confirmed that management commitment has influence safety culture, and safety communication and feedback is significantly related to safety performance and injury rates. Management commitment reflects the values top management has on safety-related issues and the understanding that workplace safety is of great importance toward organizational effectiveness. (Subramaniam et al, 2016).

VI. Conclusion:

From overall data that have been gathered and analyzed, the safety management practices played as main role in determining the safety performance in construction industry. Therefore, it is recommended to the owners that they must take a lot of initiative to be always being aware about safety among their employee and employer, whether they were being work or take a task to work within the place that needed much more attention about safety behavior among them. However, the top management should take a lot of responsibility to motivate their workers and always be remaining they about the importance of safety in the workplace. For example, the company might have had an advocate the safety program in the industry. In addition, the management need to be more concerned in the safety and

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health management in workplace especially always checks and make sure the workplace is safe to work.

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Research Paper Title: Impact of reforms in the Financial Sector.

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Abstract

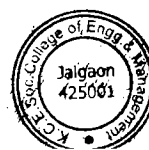
India's financial system, including its banks, stock market, bond market and numerous other financial institutions, is a key determinant of the country's economic growth trajectory. In the early 1990s, India's financial sector reforms carried out as part of the structural adjustment and economic reform plan had a profound impact on the operation of financial institutions, especially banks. The main goal of financial sector reform is to improve the efficiency of resource allocation by improving its robustness and efficiency, ensuring financial stability and maintaining confidence in the financial system. This article describes India's financial sector reforms, identifies emerging issues, and explores the prospects for further reforms.

Financial stability is more important than ever. It can prevent economic growth from being affected by system shocks, especially shocks from abroad. Although the Indian economy has avoided the Asian crisis and the recent subprime mortgage crisis, there is still much work to be done to ensure the stability and durability of the financial system. The current financial crisis in major economies will also affect India's financial system. Although India's financial institutions and regulatory agencies are gradually developing, it is time to promote the next generation of financial reforms in a more coordinated manner.

Keywords: Financial stability, current financial crisis, resource allocation, emerging issues.

Introduction:

The ability of the financial system to use domestic savings and foreign capital for productive investment and to provide financial services (such as payments, savings, insurance, and



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pensions) to the vast majority of households will affect economic and social stability. However, the system is unable to provide appropriate services to most domestic retail customers, small and medium-sized enterprises, or large companies with 70% government ownership of the banking industry, and it affects the development of corporate debt and derivatives markets. Obviously, this will become an obstacle to high growth. At the same time, various parts of the financial market have been reformed so that the banking sector can effectively play its intermediary role. In order to mutually reinforce the reform measures, the reform process has been promoted through the analysis and recommendations of various committees/working groups, as well as extensive consultations with experts and market participants. The financial sector is properly regulated, but it has got rid of government regulations that restrict the development of certain capital markets and make other capital markets uncompetitive and inefficient. Otherwise, it may create millions of urgently needed jobs. More importantly, Will produce a huge multiplier impact on economic growth.

Sometimes, financial stability is more important than ever to prevent economic growth from derailing due to the impact of the system's era, especially from abroad. Although the Indian economy has avoided the Asian crisis and the recent subprime mortgage crisis, there is still much work to be done to ensure the stability and durability of the financial system. The current financial crisis in major economies will also affect India's financial system. Although India's financial institutions and regulatory agencies are gradually developing, it is time to promote the next generation of financial reforms in a more coordinated manner.

The growing and increasingly complex market-oriented economy and its greater integration with global trade and finance will require deeper, more effective and well-regulated financial markets. Therefore, it is necessary to debate the various problems and challenges faced by the financial sector and find solutions.

Special features of the reforms in the financial sector.

These reforms are not driven by any banking crisis, nor are they the result of any external support plan. In the early 1990s before the Asian financial crisis, international institutions and other countries recognized the importance of crisis prevention in the financial sector and adopted these measures very early.

The reforms were carefully sorted according to tools and goals. Therefore, prudential regulations and strengthened supervision were introduced at the beginning of the reform cycle,



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and then interest rate controls were relaxed and the statutory pre-emption rights were gradually reduced.

When the basic principles of reform have been established, more complex aspects of legal and accounting measures follow. Recently, the regulatory framework has also worked to ensure good governance through "appropriate and appropriate" bank owners, directors and senior managers. Prioritize diversified ownership.

Although the focus of the first generation of reforms was to create an efficient, productive and profitable financial services industry, starting from the second half of the 1990s, the second phase of financial sector reforms aimed to strengthen the financial system and introduce structural improvements.

To increase competition in the banking industry, new private banks were licensed. The prerequisite for granting the license is that these banks must be fully automated from day one. These banks have become high-tech banks, and the results are self-evident. This has a "demonstration" effect on the entire system. The government's ownership in the nationalization and the National Bank of India was weakened because they allowed them to raise capital from the stock market up to 49/45% of the paid-in capital.

A unique feature of the public sector banking reform that dominates the Indian banking industry is the process of financial restructuring. The government has injected capital into banks to achieve prudential regulations by injecting capital into bonds. Taking into account the moral hazard, the mechanism of liquidating non-performing loans to another government asset management company is considered inappropriate. The balance of non-performing loans must be managed by the bank itself.

Subsequent equity and offer sales to private shareholders were conducted through public offerings, not sales to strategic investors. Therefore, all public sector banks shared with private shareholders have been listed on the exchange and are subject to the same disclosure and market discipline standards as other listed entities.

Compared with the experience of other countries, capital restructuring has a lower cost to GDP. From a cumulative point of view, this figure accounts for approximately one percent of GDP. In addition, the market value of stocks held by the government now far exceeds the cost of capital restructuring. In order to further advance the reform process, as announced in the budget last year, the government decided to convert the issued special bonds (basically non-



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transferable) heavy debt into securities that are indistinguishable from other government securities. This process has already begun. In 2006-07, the government converted nearly Rs 80 crore into SLR securities. The balance of special securities will be phased out over a period of time.

Banks are also allowed to diversify various financial services, and now provide various financial products such as universal banks.

Active steps have also been taken to improve institutional arrangements, including legal frameworks and technical systems. In order to solve the problem of high-level non-performing assets, a debt recovery court was established after the 1993 Bank and Financial Institution Debt Recovery Act was passed. In 2002, the "Securitization and Reconstruction of Financial Assets and Enforcement of Security Interests" (SARFAESI) law was passed.

Although the transfer of non-performing assets of public sector banks to separate asset management companies is not considered, an institutional mechanism has been established to deal with non-performing assets of banks and financial institutions. Allow the establishment of asset restructuring companies, which belong to the private sector and act as independent business entities to obtain non-performing assets from any financial entity, and reorganize and repair or liquidate them within a certain period of time. This creates a market for bad assets in India.

Government securities currency and foreign exchange markets have a significant public policy impact on emerging market economies. During the reform period, the diversity of participants and tools was impressive. The smooth operation of the payment and settlement system is a prerequisite for financial stability. Introducing RTGS and establishing CCIL as the main counterparty of securities and foreign exchange transactions, and ensuring that the securities and capital branches of the transaction improve the efficiency of the payment mechanism.

In terms of procedures, some interesting features of the reform are also obvious. The first is its gradualism, in which reforms are carried out only after continuous consultations with all stakeholders. This more participatory process of participation not only encourages more informed assessments of the basic content of the policy, but also increases the credibility of the policy and generates lasting expectations in the economic entities for this process.



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The impact of reforms on the banking industry

(I) Performance indicators

Various measures taken in the past 15 years have greatly enhanced the strength of the commercial banking sector in terms of profitability, asset quality and capital status. Especially the soundness parameters of the banking system have shown continuous improvement.

A similar trend can be seen in the net non-performing asset ratio during the same period, which reflects the banks' better recovery rate and better fund allocation. In recent years, driven by strong macroeconomic performance and institutional measures initiated by the Reserve Bank/government, the recovery climate has improved significantly.

Various measures taken in the past 15 years have greatly enhanced the strength of the commercial banking sector in terms of profitability, asset quality and capital status. Especially the soundness parameters of the banking system have shown continuous improvement. A similar trend can be seen in the net non-performing asset ratio during the same period, which reflects the banks' better recovery rate and better fund allocation. In recent years, driven by strong macroeconomic performance and institutional measures initiated by the Reserve Bank/government, the recovery climate has improved significantly.

Comparison with other countries

Several balance sheet and profitability indicators indicate that Indian banking indicators are moving towards global benchmarks.

Select bank indicator: off-road

NPA solution

The Narasimhan Commission I once suggested the establishment of an asset creation fund. Public sector banks will transfer non-performing assets to the asset creation fund under certain protection. After deliberation, it was decided not to use this method. Instead, banks are required to deal with all non-performing assets by themselves. It is obvious from the above performance indicators that this strategy is effective. Financial support is not a heavy burden. The remaining problems such as non-performing loans have been absorbed by banks and have not been transferred to financial service companies. Although the government subsequently passed a piece of legislation to create a new category of companies called asset reconstruction



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companies, it must be pointed out that these entities are private business entities and work on a commercial basis to deal with non-performing assets. These institutions and the rules that allow banks to buy and sell non-performing assets and corporate debt restructuring mechanisms enable banks to deal with "funds flows" rather than just stocks of non-performing assets. These measures enable banks to continue to deal with non-performing assets.

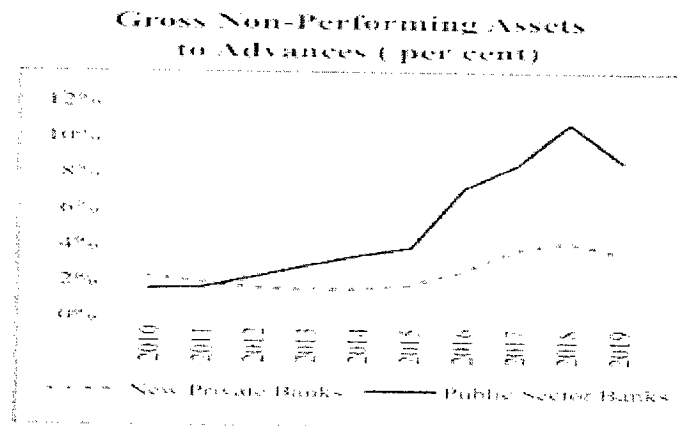


Fig.1.Gross NPA to Advances

Ownership structure:


Since public sector banks could divest only by accessing the stock markets except for a few banks all the others are now listed on the stock exchanges. All new private banks are listed and there is considerable foreign investment (both FDI and FII) in these banks. In five of the existing eight banks foreign shareholding had crossed 50 percent. ‡Even among the old private banks all significant banks are listed

Consolidation:

The integration process is also going on in India. Since 1990, there have been 19 mergers in the commercial banking sector. Bank mergers in India are mainly for the purpose of matching the strengths of the merged institutions. The Reserve Bank of India has formulated extensive guidelines for the merger of private banks from a supervisory and prudential perspective. These guidelines are modified as necessary and applicable to public sector banks within the relevant scope.

Extension of coverage of reform process.




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The reform process initially focused on commercial banks. However, after significant progress has been made in transforming commercial banks into sound institutions, the reform process has been extended to other institutions such as Regional Rural Banks (RRB), Cooperative Banks, All India Financial Institutions (AIFI) and Non-Bank Financial Companies (NBFC).

Regional rural banks, urban cooperative banks and rural cooperative credit institutions can play an important role in financial inclusion and deepening of the financial sector, especially in rural areas.

Now, through the negotiation method of policy formulation, urban and rural cooperative credit institutions have embarked on the path of recovery, ensuring feasible regulatory arrangements to overcome incentive problems and financial support when necessary. The strategy has begun to show results, which is critical to maintaining its role as a financial intermediary between the urban and rural poor and small depositors.

Banking reform

Changes in CRR and SLR: One of the most important reforms includes lowering the cash reserve ratio (CRR) and legal liquidity ratio (SLR). SLR has been reduced from 39% to the current 19.5%. The cash reserve ratio was reduced from 15% to 4%. The reduction of SLR and CRR provides banks with more financial resources, which can be used to provide loans to agriculture, industry and other economic sectors.

Current Key Rates

Date	Repo Rate	Reverse Repo Rate	CRR	SLR
May 2020	4%	4%	3%	18%
Mar 2020	4.4%	4.4%	3%	18.25%
Feb 2020	5.15%	4.9%	4%	18.25%
Oct 2019	5.15%	4.9%	4%	19.5%
Aug 2019	5.4%	5.15%	4%	19.5%
June 2019	5.75%	5.5%	4%	19.5%
Apr 2019	6%	5.75%	4%	19.5%
Feb 2019	6.25%	6%	4%	19.5%
Dec 2018	6.5%	6.25%	4%	19.5%
Oct 2018	6.5%	6.25%	4%	19.5%



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Aug 2018	6.5%	6.25%	4%	19.5%
Jun 2018	6.25%	6%	4%	19.5%

Managing interest rate changes: In the past, systems for managing interest rate structures were common, and RBI determined the interest rates charged by banks. The main purpose is to provide credit to the government and certain priority departments at preferential interest rates. The system has been cancelled and the Reserve Bank of India no longer determines the deposit interest rate paid by the bank. However, the Reserve Bank of India charges interest on small loans not exceeding 200,000 rupees, and the interest rate should not exceed the preferential loan interest rate.


Capital adequacy ratio: The capital adequacy ratio is the ratio of paid-in capital and reserves to bank deposits. The capital adequacy ratio of Indian banks has not yet reached international standards. India has introduced an 8% capital adequacy ratio in the risk-weighted asset ratio system. Indian banks must achieve this goal before March 31, 1994, and foreign banks must meet this standard before March 31, 1993. Now, India has introduced the Basel 3 specification.

Allowing private sector banks: After the financial reforms, private banks we are given life and HDFC Bank, ICICI Bank, IDBI Bank, Corporation Bank etc. were established in India. This has brought much needed competition in the Indian money market which was essential for the improvement of its efficiency. Foreign banks have also been allowed to open branches in India and banks like Bank of America, Citibank, and American Express opened many new branches in India. Foreign banks were allowed to operate in India using the following three channels:

- As a branch of a foreign bank,
- As a subsidiary of a foreign bank wholly-owned by a foreign bank,
- Subsidiaries of foreign banks, the largest foreign investment does not exceed 74%.

Reforms related to non-performing assets (NPA): Non-performing assets are loans that have paid off all loans within 90 days. RBI introduced the revenue recognition criteria. According to the standard, if no income from bank assets is received within two quarters after the final date, the income is not recognized. Through Lok adalats, civil courts, courts, etc., the




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recovery of bad debts is ensured. Proposed the "Financial Asset Securitization and Reconstruction and Enforcement of Security Interests Act" (SARFAESI) to deal with bad debts.

Abolition of direct or selective credit control: Earlier, under the selective or direct credit control system, the Reserve Bank of India used a margin change system to control the supply of credit to provide traders with loans to sensitive commodity inventories, and To the broker. With the elimination of the direct credit control system, banks now have more freedom in providing credit to customers.

Promote microfinance to promote financial inclusion: In order to promote financial inclusion, the government launched a microfinance program, and the Reserve Bank of India provided guidance for this. The most important mode of microfinance is the self-help group bank contact plan. Regional rural banks, cooperative banks and formal commercial banks are implementing the plan.

Conclusion:


At this stage, an effort is made to present the concluding observations based on analysis and major findings cited in a summarized way. They are as follows:

The landmark liberalization measures laid down the basis for sound banking system and excellent progress has been made in implementing the reforms. The responses of the banks to the reforms have been impressive. The banks have been adjusting well to the new banking and financial scenario, though gradually.

The need for restructuring the banking sector in tune with global environment was felt appropriate. Hence, liberalization measures were initiated since 1992 to develop a policy framework for Indian banks in a changing global prospective. The reforms have enhanced the opportunities and challenges for the scheduled commercial banks making competitive environment.

In the face of intensifying competition, the policy changes and the operational environment in respect of the Indian banking system, there has been an increased focus on profitability, although social objectives such as priority sector lending, financial inclusion continue to be important. Consequently, most of the banks in public sector have shown a significant




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improvement in their profit performance while private sector banks continue to earn higher profits. The difference in the profit performance among different bank groups has appeared to be narrowed down.

The level of NPAs of PSBs though reduced substantially, still its volume remained high, and a noteworthy development has been their significant reduction in relation to net **advances in** recent years. NPAs are not confined to PSBs alone but are present in the private sector banks as well. The NPAs menace focused the banking sector to come up with innovative ideas for deployment of funds with minimum credit risks.

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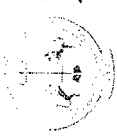
Tae Hwan Yoo*

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Recruitments & Selection Management

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Abstract

Certain great leaders who have made their mark in corporate world by their actions say that every organization can acquire the same machinery, the same infrastructure, etc. But what makes the difference in one organization to another is the manpower it possesses which cannot be copied.

Considering the aspect of sourcing, no organization should ever think that once it has acquired the best talent, created favourable conditions to retain them, they would not require going in for sourcing activities.

Keywords:-

Organization Criteria, Business Assignments, Country Business, Legal Aspect, Make in India, Globalization Challenges, Talent Actuation,

Introduction:-

In this information age, the importance of human capital and human asset cannot be ignored; rather it is that line of business that could lead any organization to attain heights. This is the factor that makes difference between one organization and another. Getting the right person at the right place and then retaining him is the main area of concern in today's corporate world. Hence, the emphasis is being laid to develop policies and programs in such a manner that it leads to retention of the desired manpower and thus contribute towards organizational development. Each organization is now thriving to attain the best person i.e. the knowledgeable workers and leverage their wisdom towards the achievement of organizational objectives. Nobody wants to have the third best or the second best, but to have the best person in the organization.



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Certain great leaders who have made their mark in corporate world by their actions say that every organization can acquire the same machinery, the same infrastructure, etc. But what makes the difference in one organization to another is the manpower it possesses which cannot be copied.

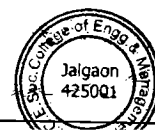
Considering the aspect of sourcing, no organization should ever think that once it has acquired the best talent, created favorable conditions to retain them, they would not require going in for sourcing activities.

Hence this should be kept in mind that sourcing is a continuous process, an outgoing one and will have its existence till the organization functions. The talent that we have acquired and retained is through its sourcing only. Unless and until a person is sourced from outside, how the organization will get the best. To have the best it is essential to acquire it from outside. There has been tremendous change in the technology and for the organization to survive in this changing scenario; it has become very essential that they keep up with the pace with the changes in the technology, the change in the culture etc.

Taking for example no organization can even think of information technology, now it becomes very difficult and costly affair to train the organization can even think of operating without the use of people within the organization at different level to learn how to make use of this technology. Hence sourcing is done, and the best talent is acquired so that the person not only takes care of changing technical needs of the organization but also be able to make another employee learn from him.

After having determined the number and kinds of personnel required the human resource and personnel manager proceeds with identification of sources of recruitment and finding suitable candidates for employment. Both internal and external sources of manpower are used depending upon the types of personnel needed. The selection procedure starts with the receipt of applications for various jobs from the interested candidates. Totally unsuitable candidates are rejected at the screening stage. Manpower planning gives an assessment of the number and type of people required in the organization.

The next task of the personnel manager is to find out capable and suitable persons who may be working in the organization itself while others will have to be sought from outside the organization. It involves persuading and inducing suitable persons to apply for and seek jobs in the organization. Recruitment refers to the attempt of getting interested applicants and providing a pool of prospective employees so that the management can select the right person



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for the right job from this pool. Recruitment is a positive process as it attracts suitable applicants to apply for available jobs. The process of recruitment

Literature Review:-

It should be administered in such a way that only those applicants who meet various job related standards are offered positions for appointment. The recruitment and selection units should actively recruit and participate in events that will foster a diverse applicant pool. Recruiting from a pool of targeted leads can decrease member attrition.

The object of my study was to understand the recruitment and selection practices. In this report, I have tried to include all the issues related to recruitment and selection process which I could gather after reading various articles of Human Resource.

Every position Vacancy will be filled based upon a thorough position analysis regardless of the level of position or the extent of the search. The diversity goals of the institution, division of affairs, and the unit will be addressed in all recruitment and selection processes.

Objectives:-

1. To Study the base of recruitment and selection process to fulfil the criteria
2. To Explain the constructive under which the process takes base on requirements
3. Describe the factor to be considered while evaluating recruiting efforts as per the quality
4. To know the various sources and methods of who connected with city, Country etc.
5. To define selection and explain the selection process study gave proper Logic calculation.

Mythology:-

It is a descriptive research method which is based on observation and questionnaire. Here, the researcher has tried to describe the process of performance appraisal with reference to Chassis Brakes International.

Primary Data:

The study is based on primary data. That is awareness towards objectives of the employees, their skill set, their preparation for job expectancy is collected through structured questionnaire.

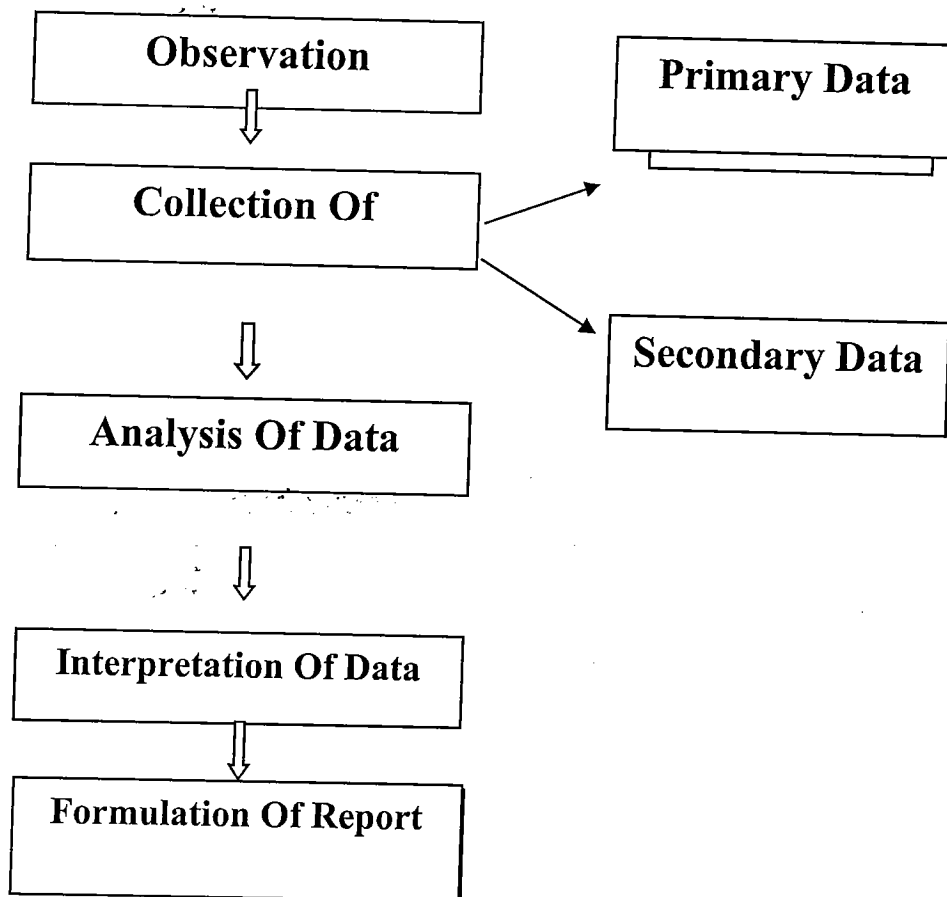
Secondary Data:



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The study is also based on secondary data. It involves basic theories related with performance appraisal and company details. The secondary data is collected through various sources like books and websites.

Project Research Approach:



Conclusion:-

The best way to fill up vacancies of an organization and the selection Procedure is the most important criteria to determine whether an applicant meets the qualification for a specific job of organization. Therefore, recruitment and selection are one of the most important functions in management of Personnel.

Study of Process (Graduate Undergraduate), I have got to know detailed information about the recruitment and selection process. Similarly, I have also got to know their major functions, and their importance in business processes.

From the project work carried have gained a lot of practical experience in the Subject of "Recruitment Selection Process." And this practical experience helped me to understand the various key factors, and it also helped to put suggestion.



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The Company mainly focuses on internal sources which has its own limitations. By focusing on Campus Placements Company can attract qualified personnel for vacant jobs in the organization. It can facilitate the infusion of fresh blood with new ideas in to the enterprise. This will improve the overall working of the enterprise.

For the selection of the candidate for a vacancy company should first conduct written test and on the basis of the result of the test score interview should be scheduled for the selected candidate.

Recommendation:-

- Study of the selection process Generated the following aspects:
- The process at is in-line with the recruitment policy of the company. The entire process works exactly the way it should.
- The process i.e. the activity of generating the pool of perspective employees, is similar for all the entry-level positions. However, the selection process is unique for every position.
- If the above suggestions are followed, it may help the to have a more effective selection procedure.
- Interest Test
- Projective Test
- Physical Test
- The tests are applicable for both graduates and undergraduates.

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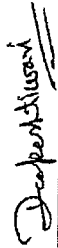
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Emerging Issues on Contemporary Business Practices in the
Era of Intelligence (EICBI)





CERTIFICATE OF PRESENTATION

This is to certify that **Mr. Mayur K Borse**has presented a
paper titled **Recruitments and Selection Management**

..... in the 2nd International Conference (EICBI)
organized by Departments of MBA & MCA, Shri Ram Murti Smarak College of Engineering and Technology, Bareilly
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(Dr. Deepesh Tiwari)
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Conference Convener


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New Virtues of Engineering Teacher of India for Modern Era over the Ancient Era

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Abstract: This research consists of the virtues required for the engineering teachers of modern era. The virtues are mainly classified into two categories as 1) Individual/personal virtues and 2) Professional/Educational virtues. These virtues are to be modified from ancient era to modern era as there are many changes in overall educational system. As educational system rapidly shifting from Gurukul system to the digital modern class room system, the techniques of teaching and learning in engineering education also have been changed. New technology is being invented daily in the field of engineering. So, the teachers of engineering have some new virtues which can be applicable in today's life. By studying these virtues, we may develop new scientific and innovative approach in engineering students. The engineering teachers should not only have the virtues like morality but at the same time then they must have the new virtues like a good researcher, innovative and should have professional ethics and administrative skills too. This research will help to the teacher who wanted to do something new in the field of teaching and learning of engineering. These virtues are useful to the modern teachers of engineering to develop their skills as well as to develop a new innovative and research approach in students of engineering.

1. Introduction

The concept of 'Education' has been rapidly changed from ancient time to modern time. In ancient time the education system was teacher-oriented. The syllabus for the courses was designed by the Gurus (teachers), the medium of education, method of teaching, duration of the course, rules and regulators for the course etc. were final and no one can challenged it. The study of various Vedas & Upanishad was carried out during that time. The main language used in that period were 'Sanskrit' and 'Pakruit'.

In modern time the education- system has become very vast & fast. It has been shifted from teacher oriented system to the student Oriented education system. The modern education system focuses on the overall development of the student. Acronym of 21st century engineering teachers is becoming as T-Technology oriented, E-Effective and Efficient, A-Anticipate future, C-Continuous Learning, H-Healthy peers relationship, E-Empathize with students and R-Research/project oriented.

In the field of technical education, mostly at engineering, tremendous changes[1] have been observed from 1991. In India, from 1991, various industrial & economical changes observed, different industrial were introduced by the Indian government, various jobs in the fields of technology started during this period. So, most of the students were attracted for getting admission in engineering and industrial ethics are introduced in education that time [2]. In 1950, there were only ten thousand students admitted for the degree course of engineering while in 2000, about one lakhs students took admission to the various degree courses in engineering.



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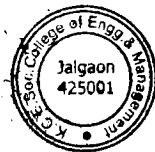
At present, the number of engineering colleges has been increased out of limit; number of students is very less because of very less job opportunities after completing the degree in engineering. So, the attitude of students, teachers and parents about engineering field has become somewhat negative[3].

2. Virtues

In the beginning of 19th century, AICTE had given the permissions to many engineering colleges without considering and gassing the number of possible admissions. It was also not considered the number of vacancies available after engineering degree. So, in modern time, the role of professors in engineering is very important. As the education system has been changed from ancient to modern very rapidly, the responsibilities and virtues of teachers working in engineering colleges also changed[4] as per the need of modern era. They can be classified in to two types as personal or individual virtues and professional/ educational virtues.

1.1. Group I: Personal/Individual Virtues

- 1) Knowledge: The purpose of engineering is not only to have the subject content knowledge but also the teacher must find other information related to the subject from internet or from any other social media to update the knowledge because the modern students are also using internet and other techniques for their study. So, the teacher of engineering must have overall knowledge of teaching subject and other references. Presently some teachers are focusing other irreverent aspects than knowledge [5] that may lead to degradation of educational system.
- 2) Confidence: the teacher of engineering must have confidence of teaching i.e. he/she must be confident about what they are teaching in the class. If the teacher is confident enough in the class, the effect in teaching will be more. It can be developed by proper preparation before teaching any topic in the class.
- 3) Punctual: The teacher of engineering must be punctual. He must report the college learn 10 minutes before the reporting time and should follow the timings of the institute. He/she must support the class before two minutes of starting lecture. The lecture must be planned properly and should complete in time. The teacher must be present to various meetings academic and non academic on time. If the teacher reaches to the class on time then the students will not bunk the lecture and they will be pleasant in class before the teacher.
- 4) Discipline: The teacher must follow the classroom discipline as well as academic discipline all academics and non academic activities of the college must be follows as per the planning with proper discipline. While teaching on the class, the teacher must be well disciplined. All students must be serious in studies lecture. There should not to make any noise and misconduct in the class, then only the teaching –listening will be effective. The teacher should think about perspective [6, 7] of students.
- 5) Regular: The engineering teacher must be regular be regular regarding to his classroom teaching, various, activities, examinations and other co-curricular activities. He/she should not miss any lecture without any intension. He/she must inform to the principal or head of the department regarding the leaves so that the alternative arrangement may be possible on time.



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- 6) Systematic: The teacher should be kept the personal cleanliness as well as the cleanliness of the campus. He/she must be good looking. The teacher keeps all the academic records/things systematically.
- 7) Hardworking: The engineering teacher must be hard-working. He/she must be ready to do any work may be of academic or non academic. The engineering teacher must take effects for the progress of the students as well as the institute. He/she must be ready to take extra effects of any extra work of institutions by which the institutions will be develop.
- 8) Interest: If the person do not have any interest in teaching then such a person can't become a good teacher for the engineering. There must be a deep interest for the branch and subject which has been selected for teaching. So, without interest no teacher can teach to the students properly. Such interested teacher will not feel teaching as a burden or load.
- 9) Research-oriented: Engineering teacher must have researches attitude. He/she must search new things, concepts and techniques in teaching. The teacher must carried out experiments by which the new things will be find out and research attitude in students can be develop easily. Teachers must maintain the ethics in research [8] and its publication. All the articles and write up should be plagiarized. If the teacher uses new research techniques then the students will also take interest in learning new concept.
- 10) Skilful: Engineering teacher must be master in his own subject. He/she must be awake about the branch which is to be thought. He/she should know where it can be used as a sub-branch and how the new instruments can be develop by using this branch and can co-relate it with other new branches. The engineering teacher must also know the various uses of machineries of one branch which can be used for the new branches.
- 11) Prepared: The teacher must prepare the subject notes, academics notes, notes regarding co-curricular activities etc. Prepared teacher means ready to do any work at any time. If the teacher is well prepared then the teaching learning will be more effective and attractive.
- 12) Inspiring: The teacher should motivate students by inspiring them. So, the engineering teacher must be more energetic, pleasant and good looking by which the students will be inspirers to work more effectively. If the engineering teacher performs some activities by which the students can be motivated then it will be inspiring for them.
- 13) Co-operative: In Modern era, engineering teacher must be co-operative with the staff, students and parents because nowadays there is student oriented education system so only co-operative teacher may be a successful teacher.
- 14) Loving, Peaceful and Polite: The main virtue of any teacher is that he/she must have loving personality. the teacher should have a equal love for all the students then only the students will listen more effectively and would like that teacher.
- The teacher must listen the problems of students peacefully and communicate with them peacefully then and only then the students will also be quite in the class and will communicate with the teacher respectfully. It is expected that the teacher should be polite with the students, co-teachers, seniors, management and with society i.e. with parents and other people of the society.



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15) **Honest and Responsible:**The teacher of engineering must know the responsibilities regarding to academics. Teaching work includes theory and practices, co-curricular responsibilities like cultural activities, Annual function, sports activities etc.

In engineering, the students have to carry out various practical, projects, small researches etc. So, they should be guided by the teacher properly and accurately. It can be possible only when the teachers of engineering would understand their responsibilities. For implementing the ethics of teaching about theory and practical, the teacher must be honest with his/her profession.

16) **Ambitious:**Every institute have its own aims and objectives. To fulfil those objectives, the teachers of that institution have to play very vital role[9].The teacher of engineering must be ambitious means there should be some proper objectives. The engineering teachers do not have the limited aim of teaching and completing the syllabus but the teacher must think for his/her up-gradation as well as the up-gradation of the institution.

The engineering teacher should think about some projects and research work by which the personal status of the teacher as well as status of institution would be increase and other engineering teachers would also be motivated for doing various researches and projects.

17) **Leadership:** The engineering teacher should have the virtue of leadership. The teacher must be a leader of the class as well as of the institutions. The leader of the group must motivate the group members for their up-gradation. In engineering, most of the practical, projects, co-curricular activities are performed in group. So, the leadership qualities must be develop among the engineering students so that they can complete their work more easily and effectively.

By developing the virtue of 'leadership' the engineering teacher can make different student leaders that may be the future researches of the new era.

18) **Morality:**Engineering teacher must follow the educational and social ethics[10]. The teacher must have a good moral character because society expects much more good things from the teacher. In modern time, professional morality has become more important than individual morality[11].

1.2. Group II Teaching Virtues/Educational Virtues

These Virtues are essential for the engineering teacher while teaching in actual class room. These virtues are useful to make learning of the students more easy and powerful to increase the knowledge of the engineering students and to get professional ethics [12].

1) **Communication skill:** Engineering teacher should be expect to have good communication because teaching-learning process is a two way process. The teacher must have Communication skill for the following purposes.

a) To express the knowledge systematically, the teacher must have proper pronunciation. The voice of the teacher should be proper as per the class room.

b) Engineering teacher should be use of small projects, models, graphs etc. To explain particular teaching topics, the teacher must use the Communication skill.



c) The body-Language of the engineering teacher must be proper example the movements of hands, eye contacts, gestures etc should be proper. All these are essential for the engineering teacher in actual class room.

2) Fluent: Engineering teacher must be fluent so that he/she can easily communicate with the students. To make the teaching more efficient, the teacher should ask some question on the teaching until after teaching. By this methodology, teaching will become bi-polar or two-way.

3) A good planner: A teacher should plan for teaching at the beginning of every academic year. He/should think about the methodology of teaching. They also plan for resource required for teaching. In engineering colleges, the grasping power of every student is different. So for extra ordinary students and the average students, the teachers also may plan some extra lectures in the academic plan. So, engineering teacher must be a good planner.

4) Imaginative: Engineering teacher must be imaginative. He/she should imagine something which is abstract in nature. The teacher should have the vision to observe the common objects differently. Various inventions are the outcome of such a vision which can be possible by a good imagination.

The scientific and analytical attitude must be developing the engineering students by the teachers of engineering because the can search for the new innovative things.

5) A good reader, thinker and philosopher: 'Reading' should be the passion of engineering teacher. Without reading, no teacher can teach properly teach any topic to the students. In engineering, there are various technical concepts which requires a deep reading for understanding it. So, the teacher first should read it in details, find out some new vocabulary and its meaning and some new theorems.

Only reading is not sufficient for the effective teaching for that the teacher should always think about the new concepts, techniques etc which can be applicable for teaching to the engineering students. With the help of some senior students, the teacher can develop some mini projects and research papers so engineering teacher must be imaginative to find the new thinks which can possible only by the deep thinking over any topic so the teacher of engineering should also be 'A Good Teacher'.

As a philosopher, engineering teacher must read various text books, reference books, articles, research papers etc so that span of knowledge can be expanded as technology is day by day changing and it is also the need of modern time. So, the modern teacher must be updated.

6) Innovative: Engineering teacher must be conscious about the daily changes happening in the field of education. He/she should know the new concepts, researches done in the subjects which he/she is teaching to the students. The teacher of engineering should have the scientific vision. The teacher must find out the new things, concepts and rules for the common things or objects. 'Innovative approach' must be the soul of engineering because when the students will search for the new concepts in the technology, then and only then they can find out some extra ordinary things. So, aim of every engineering teacher in the modern time must be 'innovative', always reader of new things or concepts.



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7) A good Researchers: 'Research' means not always to find new things but to do anything with new techniques by doing new experiments and extracts new outcomes from any work. The main aim of getting engineering education is to enhance the capability of human being according to the developed concepts by many researchers.

Engineering teachers must apply several techniques to teach the subjects or contents differently by using techniques that the students can understand the particular topic.

The engineering teacher in modern time must develop 'research Attitude' among the students so that they can be a further researchers. By applying this concept, they can solve any problem form their life, from society and the problems of industries.

8) Positive: the attitude of engineering teacher must be positive towards the students as well as toward the teaching. Most of the students come after passing HSC examination to the engineering. They are somewhat confused regarding to the change atmosphere from school to college so the engineering teacher must motivate to the students to adjust with the new environment and should develop the positive attitude toward the learning the new technology. Teachers should play a role model for the new students. If the teachers always give positive suggestions to the students then only the development of engineering community in modern time is possible.

9) Impartial: the term 'Impartial' means equal to all. The engineering teachers must be impartial regarding to the sex, class, culture, category etc. In modern era, some teachers gives more internal marks to the intimates or students, sometimes the private tuition students also getting more marks in internal and external examination.

The teacher of engineering while evaluating the paper or to the student, must give the marks as per the performance of the students and not on the basis of intimate relations or any other factors. The impartial teacher is always respected by all types of students belonging to any race or religion and can always be recommended by the students.

10) Pleasant and good-looking: the personality of teacher plays an important role in teaching and learning process. The engineering teacher must be up to date in knowledge as well as he/she must have to maintain a good personality.

A good personality doesn't mean only wearing good cloths but the inner beauty of the teacher should reflect on the face of the teacher. The teacher must be pleasant and happy when he/she enters the class for teaching. There should be a big smile on the face of the teacher and the teacher should treat each student with the same attitude. Such a teacher is always like by the students. The students also can share their feeling with such teacher freely without any hesitation.

3. Conclusion:

The virtues required for the engineering teachers have been changed from ancient age to modern age. The various outcomes are observed. The educational system has been rapidly changed from Gurukul system to the digital class room teaching. The ethics of engineering also changed from moral ethics to professional ethics. The virtues of modern engineering teachers have been shifted from value education to research oriented education. The additional virtue like innovative approach, scientific attitude, technical skills are required for modern age engineering teachers. The role of



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modern engineering teachers has been changed from teacher as Guru in past to a guide, a researcher and a good friend to the student of modern engineering. The engineering education system has been changed rapidly from 1990 onwards; the new techniques of teaching have been invented and are used in the modern era. The engineering teacher should not only be moral by virtue but he/she should have the virtue of teaching and learning new things, concepts and latest technologies. As a modern system, education system is a student-centric-system. So, the teacher of engineering should always use the virtues for the up-gradation of the students and to develop a new innovative and research-oriented-attitude in the engineering students.

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