

Hybridized Wrapper Filter Using Deep Neural Network for Intrusion Detection

N. Venkateswaran^{1,*} and K. Umadevi²

¹Information and Communication Engineering, Anna University, Chennai, 600025, India

²Department of Electronics and Communication Engineering, Sengunthar Engineering College, Tiruchengodu, 637205, India

*Corresponding Author: N. Venkateswaran. Email: nvenkateswaran21@yahoo.com

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Abstract: Huge data over the cloud computing and big data are processed over the network. The data may be stored, send, altered and communicated over the network between the source and destination. Once data send by source to destination, before reaching the destination data may be attacked by any intruders over the network. The network has numerous routers and devices to connect to internet. Intruders may attack any were in the network and breaks the original data, secrets. Detection of attack in the network became interesting task for many researchers. There are many intrusion detection feature selection algorithm has been suggested which lags on performance and accuracy. In our article we propose new IDS feature selection algorithm with higher accuracy and performance in detecting the intruders. The combination of wrapper filtering method using Pearson correlation with recursion function is used to eliminate the unwanted features. This feature extraction process clearly extracts the attacked data. Then the deep neural network is used for detecting intruders attack over the data in the network. This hybrid machine learning algorithm in feature extraction process helps to find attacked information using recursive function. Performance of proposed method is compared with existing solution. The traditional feature selection in IDS such as differential equation (DE), Gain ratio (GR), symmetrical uncertainty (SU) and artificial bee colony (ABC) has less accuracy than proposed PCRFE. The experimented results are shown that our proposed PCRFE-CDNN gives 99% of accuracy in IDS feature selection process and 98% in sensitivity.

Keywords: Deep neural network; intrusion detection; machine learning

1 Introduction

Nowadays Computer networks, wireless networks are widely used by variety of applications which are prone to myriad of security threats and attacks. The security challenges that have to be solved originate from the open nature, the flexibility and the mobility of the wireless communication medium [1,2]. In an effort to secure these networks, various preventive and protective mechanisms such as intrusion detection systems (IDS) were developed [3]. Primarily, IDS can be classified as: host based intrusion detection systems (HIDS) and network based intrusion detection systems (NIDS) [4]. Furthermore, both HIDS and NIDS can be categorized into: signature-based IDS, anomaly-based IDS and hybrid IDS [5,6]. An Anomaly



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Optimized Neural Network-Based Micro Strip Patch Antenna Design for Radar Application

A. Yogeshwaran^{1,*} and K. Umadevi²

¹Dhanalakshmi Srinivasan Engineering College, Perambalur, 621212, Tamil Nadu, India

²Sengunthar Engineering College, Tiruchengode, Namakkal, 637205, Tamil Nadu, India

*Corresponding Author: A. Yogeshwaran. Email: yogeshwaranaphd@gmail.com

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Abstract: Microstrip antennas are low-profile antennas that are utilized in wireless communication systems. In recent years, communication engineers have been increasingly interested in it. Because of downsizing, novelty, and cost reduction, the number of wireless standards has expanded in recent years. Wideband technologies have evolved in addition to analog and digital services. Radars necessitate antenna subsystems that are low-profile and lightweight. Microstrip antennas have these qualities and are suited for radars as an alternative to the bulky and heavyweight reflector/slotted waveguide array antennas. A perforated corner single-line fed microstrip antenna is designed here. When compared to the basic square microstrip antenna, this antenna has better specifications. Because key issue is determining the best values for various antenna parameters when developing the patch antenna. Optimized Neural Network (ONN) is one potential technique utilized to solve this issue, and this work also uses Particle Swarm Optimization (PSO) to enhance the antenna performance. Return loss (S11) and Voltage Standing Wave Ratio (VSWR) parameters are considered in all situations, developed with Advanced Design System (ADS) applications. The transmitters are made to emit in the Ku-band, which covers a wide range of wavelengths. From 5–15 GHz, it is used in most current radars. The ADS suite is used to create the simulation design.

Keywords: Optimized neural network; particle swarm optimization; patch antenna; c-band; return losses

1 Introduction

Wireless communication has been progressively evolving in recent years, including revolutionary antenna technology demands. The antenna structure is a critical component of many wireless communication systems, including wireless Local Area Network (WLAN), Wireless Fidelity (WIFI), mobile phones, traffic radar, Global Positioning System (GPS), military, biomedical, and aerospace applications. Patch antennas arrays provide many advantages, including small dimensions, low density, low cost, high throughput, adaptability with horizontal or semi media, rapid manufacture, and connection



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Design and experimental investigation on VL-MLI intended for half height (H-H) method to improve power quality using modified particle swarm optimization (MPSO) algorithm

Satish Kumar Ramaraju^a, Thenmalar Kaliannan^b, Sheela Androse Joseph^c, **Umadevi Kumaravel^d**,
Johny Renoald Albert^{b,*}, Arun Vignesh Natarajan^e and Gokul Prasad Chellakutty^f

^aDepartment of Medical Electronics Engineering, Sengunthar College of Engineering, Namakkal, Tamilnadu, India

^bDepartment of EEE, Vivekanandha College of Engineering for Women, Namakkal, Tamilnadu, India

^cDepartment of EEE, Kongu Engineering College, Perundurai, Tamilnadu, India

^dDepartment of EEE, Sengunthar Engineering College, Namakkal, Tamilnadu, India

^eDepartment of ECE, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, India.

^fDepartment of ECE, SNS College of Engineering, Coimbatore, Tamilnadu, India

Abstract. A Voltage lift performance is an excellent role to DC/DC conversion topology. The Voltage Lift Multilevel Inverter (VL-MLI) topology is suggested with minimal number of components compared to the conventional multilevel inverter (MLI). In this method, the Modified Particle Swarm Optimization (MPSO) conveys a primary task for the VL-MLI using Half Height (H-H) method, it determine the required optimum switching angles to eliminate desired value of harmonics. The simulation circuit for fifteen level output uses single switch voltage-lift inverter fed with resistive and inductive loads (R & L load). The power quality is developed by voltage-lift multilevel inverter with minimized harmonics under the various Modulation Index (MI) while varied from 0.1 up to 1. The circuit is designed in a Field Programmable Gate Array (FPGA), which includes the MPSO rules for fast convergence to reduce the lower order harmonics and finds the best optimum switching angle values. To report this problem the H-H has implemented with MPSO to reduce minimum Total Harmonic Distortion (THD) for simulation circuit using Proteus 7.7 simulink tool. Due to the absence of multiple switches, filter and inductor element exposes for novelty of the proposed system. The comparative analysis has been carried-out with existing optimization and modulation methods.

Keywords: Solar-Photovoltaic, voltage lift-multilevel inverter, particle swarm optimization algorithm, half height, field program gate array

1. Introduction

The electrical system has major problems due to the presence of harmonic contents in the power quality features. The harmonics may be classified into

*Corresponding author. Johny Renoald Albert, Department of EEE, Vivekanandha College of Engineering for women, Namakkal, Tamilnadu, India. E-mail: jorenoeee@gmail.com.

Congestion management in deregulated power system by series facts device using heuristic optimization algorithms

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Authors: George, Sophia Jasmine (<https://content.iospress.com/443/search?q=author%3A%28%22George,+Sophia+Jasmine%22%29>)^a; | Ramaraju, Satish Kumar (<https://content.iospress.com/443/search?q=author%3A%28%22Ramaraju,+Satish+Kumar%22%29>)^b; | Venkataraman, Vanitha (<https://content.iospress.com/443/search?q=author%3A%28%22Venkataraman,+Vanitha%22%29>)^c; | Kaliannan, Thenmalar (<https://content.iospress.com/443/search?q=author%3A%28%22Kaliannan,+Thenmalar%22%29>)^d; | **Kumaravel, Umadevi** (<https://content.iospress.com/443/search?q=author%3A%28%22Kumaravel,+Umadevi%22%29>)^e; | Veerasundaram, M. (<https://content.iospress.com/443/search?q=author%3A%28%22Veerasundaram,+M.%22%29>)^f

Affiliations: [a] Department of EEE, Sri Krishna College of Technology, Coimbatore, Tamilnadu, India | [b] Department of Medical Electronics Engineering, Sengunthar College of Engineering, Namakkal, Tamilnadu, India | [c] Department of Electrical and Electronics Engineering, VSB College of Engineering Technical Campus, Coimbatore, Tamilnadu, India | [d] Department of Electrical and Electronics Engineering, Vivekanandha College of Engineering for Women, Namakkal, Tamilnadu, India | [e] Department of Electrical and Electronics Engineering, Sengunthar Engineering College, Namakkal, Tamilnadu, India | [f] Department of Electrical and Electronics Engineering, Sri Sairam Institute of Technology, Chennai, Tamilnadu, India

Correspondence: [*] Corresponding author. Sophia Jasmine George, Department of EEE, Sri Krishna College of Technology, Coimbatore, Tamilnadu 641042, India. E-mail: sophiajasmine.g@skct.edu.in (<mailto:sophiajasmine.g@skct.edu.in>).

Abstract: Conventionally in many countries, electrical power industry is organized as vertically integrated system. Under this system, large utilities are authoritative for the generation, transmission and distribution of electrical power. Such utilities are governed by the rules and regulations of the government and are forced to operate within the prescribed guidelines with minimal profit. This confirmation causes an ineffective and sluggish perspective in power industry with a lack of technical innovation, competent management and customer satisfaction. To overcome these deficiencies, power sector around the globe is getting restructured. This paper addresses an inevitable technical disputes occurring in deregulated environment i.e., transmission congestion which has an adverse effect on system security, increase in electricity pricing and line losses. Flexible AC Transmission System (FACTS) is a boon to the power sector which helps in a better and reliable power flow through the transmission lines. The problem is articulated as a multi objective function satisfying all the operational and security limits. Three heuristic algorithms namely Particle Swarm Optimization (PSO), Symbiotic Organism Search (SOS) and hybrid Quantum based PSO-Bio-geography based krill herd optimization (Q-PSOBBKH) algorithms were applied in finding solution to this complex congestion problem. To study the effectiveness of the proposed objective, IEEE 14 bus system was considered as the test system. In order to validate the proposed methodology three congestion cases i.e. bilateral transaction, multilateral transaction and overloading were imposed on the test bus system. Simulation was carried out in MATLAB.

Keywords: Deregulated power system, particle swarm optimization, symbiotic organism search algorithm, hybrid quantum based PSO, bio-geography based Krill Herd Algorithm

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IOT based Water Quality Monitoring System with Chloro Neutraliser

Maheswari K T^{1*}, Lakshmanan M², **Ponmurugan P³**, Kamatchi Kannan V⁴, Devavikashini A P⁵ and Nadin E S⁵

¹Assistant Professor, Department of EEE, Bannari Amman Institute of Technology, Sathymangalam, Erode, Tamil Nadu, India.

²Associate Professor, Department of EEE, CMR Institute of Technology, Bengaluru, Karnataka, India.

³**Head-R&D, Associate Professor**, Department of EEE, Sengunthar Engineering College, Tiruchengode, Tamilnadu, India.

⁴Associate Professor, Department of EEE, Bannari Amman Institute of Technology, Sathymangalam, Erode, Tamil Nadu, India.

⁵UG Student, Department of EEE, Bannari Amman Institute of Technology, Sathymangalam, Erode, Tamil Nadu, India.

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*Address for Correspondence

Maheswari K T

Assistant Professor,

Department of EEE,

Bannari Amman Institute of Technology,

Sathymangalam, Erode, Tamil Nadu, India.

Email: maheswarikt@gmail.com



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ABSTRACT

Water is a necessary component for humanity's survival. Because of its numerous applications, it is always in high demand. Large reservoirs of water, such as lakes, streams, and the ocean itself, provide the majority of the water supply. As a result, it's a good idea to keep an eye on things to confirm that it is fit for human consumption. Water quality monitoring is now done in traditional labs, which is time intensive and prone to errors. As a result, the goal of this article is to see if an Arduino-based sensor system for water quality monitoring is feasible. Weekly onsite tests at several daily locations were conducted using a simple prototype consisting of a microcontroller and multiple attached sensors. The system was discovered to be reliable, however it is reliant on human intervention and disposed to data mistakes. The system, on the other hand, lays a solid foundation for future growth activities in the same category, elevating the system to a higher level in Internet of Things (IoT) compatibility.

Keywords: Arduino UNO R3 board, Inline pH probe Sensor, Mineral Cartridge, Notification System, Smart Home.



Performance Evaluation of speed control using Fuzzy dependent Genetic Algorithm in PMSM

F. Vijay Amirtha Raj¹, Dr.V. Kamatchi Kannan², **Dr.P. Ponnuragan**³, Dr. K.Chitra⁴,
Dr.M. Lakshmanan⁵

¹Assistant Professor, RVS College of Engineering and technology, Department of Electrical and Electronics Engineering, Coimbatore, Tamilnadu, India.

²Associate Professor, Bannari Amman Institute of Technology, Department of Electrical and Electronics Engineering, Sathyamangalam, Tamilnadu, India.

³Professor, Sengunthur Engineering College, Department of Electrical and Electronics Engineering, Tiruchengode, Tamilnadu, India.

⁴Professor, CMR Institute of Technology, Department of Electrical and Electronics Engineering, Bangalore, Karnataka, India.

⁵Associate Professor, CMR Institute of Technology, Department of Electrical and Electronics Engineering, Bangalore, Karnataka, India

fvijayami@gmail.com, kannan.ped@gmail.com, murugan.pmsm@gmail.com,
chitra.k@cmrit.ac.in, lakshmanan.m@cmrit.ac.in

Abstract. This paper examines the role of the tuning algorithm for speed regulation of the Permanent Magnet Synchronous Motor (PMSM). The picks of the PID regulator normally provide adequate results in the application of a low-force drive, but for high-power application drives, a self PID controller doesn't provide any acceptable performance. Such applications require high-precision, superior and adaptable speed regulators and effectiveness in the cycle and execution of the plan. High-performance applications need some capacity based on High-speed high-reliability regulators, adaptability with maximum torque coefficient, higher rating capacity with minimum ripple torque. So many speed controlling mechanisms are available in the quick world, and these methods vary from the choice of regulator used in the PMSM to the method of programming/use of equipment. In this paper, generous examination is taken to control the speed of PMSM with three unique specialists, ABC based speed control drive, ANFIS controller of PMSM drive and Genetic algorithm based fuzzy controller. The planned regulators are tried through the mathematical reproductions in the MATLAB Simulink Platform. The examination between the reproduction aftereffects of execution measures are introduced toward the end. Hereditary calculation based Genetic algorithm based fuzzy controller gives some better outcome appropriate for the superior applications.

Keywords: Artificial bee colony; ANFIS; Fuzzy Controller; PID controller; Genetic Algorithm; PMSM, Speed regulation.

1. INTRODUCTION.

The development of attractive materials and power electronics devices has rendered the PMSM drive extremely important in various control applications. The PMSM motor is inherently an asynchronous motor where the field is energized by a durable magnet and a sinusoidal EMF. These motors are sufficient to make torque, near to zero rpm by the usage of permanent magnets. For the comparable force produced by induction motors, they have a more manageable packaging size. This makes PMSM machines successful in all types of special operations (e.g., Electrical vehicles and hybrid electrical vehicles, CNC machines, industry robots, ventilating and air conditioning applications). Nevertheless, PMSM sensitivity is highly susceptible to disturbances of external loads and parametric uncertainties in the system. Some



Design and Analysis of six DOF Robotic Manipulator

V G Pratheep¹, M Chinnathambi², E B Priyanka³, P. Ponmurugan⁴,
Pridhar Thiagarajan⁵

¹Assistant Professor (SI.Gr), Department of Mechatronics Engineering, Kongu Engineering College, Perundurai

² Graduate Student, Department of Mechatronics Engineering, Kongu Engineering College, Perundurai

³ Senior Researcher, Department of Mechatronics Engineering, Kongu Engineering College, Perundurai

⁴ Head – R&D, Sengunthar Engineering College, Tiruchengode

⁵ Associate Professor, Department of Mechanical Engineering, Sri Krishna College of Technology, Coimbatore

*Email:pratheep.vg@gmail.com

Abstract. The robotic manipulators are nowadays used for many applications in the industries. This project involves the design and analysis of a six DOF manipulator for welding, pick and place application. We developed a robot in SolidWorks and analysed its motion, load withstanding capacity and path traceability. However, design and analysis of a robot involves modelling of its forward and inverse kinematics. We modelled the forward and inverse kinematics by D-H parameters. The proposed model makes it possible to control the manipulator to achieve any reachable position and orientation in an unstructured environment. The inverse kinematics provided many possible combinations of angles for a single end effector position. A GUI was created in MATLAB for studying the forward and inverse kinematics of the robot. It gave results with precision of 0.2 cm. The load analysis also gave the maximum load it can withstand 200 KN without permanent deformation. The approach presented in this work can also be applicable to solve the kinematics problem of other similar kinds of robot manipulators.

Keywords. Robot, Manipulator, MATLAB, kinematics, position.

1. Introduction

Nowadays robots are used in many areas like Industries, Hospitals, Warehouse, Harbours, etc., When it comes to industries mainly robotic manipulators are used extensively. Because it can carry heavy payloads and do work more faster and smarter than humans. These manipulators are introduced into the industries for increasing the productivity and quality of products in a greater extent. The modern commercial robotic systems are very complex. They are integrated with many sensors and actuators which, have many interacting DOF and most of them require user interfaces and programming tools. When it comes to designing a robotic arm first we have to design the mechanical structure and model its kinematics. While modelling the forward and inverse kinematics of a 5 DOF manipulator the singular problem was discussed after the forward kinematics is provided. For any given reachable position and orientation of the end-effector, the derived inverse kinematics will provide an accurate solution [11]. But inverse kinematics gave many possible positions and it was complex to solve as DOF increases.

The inverse kinematics solution of general SN (cylindrical robot with dome), CS (cylindrical robot), NR (articulated robot) and CC (selectively compliant assembly robot arm-SCARA, Type 2) robot manipulator belonging to each group mentioned above were provided as examples [8]. The inverse kinematics of the P2Arm, which makes it possible to control the arm to any reachable position in an unstructured environment. The strategies developed here could also be useful for solving the inverse



DESIGN AND ANALYSIS OF SAND SIEVING MACHINE

R.BALAJI
B.E/MECHANICAL ENGINEERING
SENGUNTHAR ENGINEERING
COLLEGE
(AUTONOMOUS)
TIRUCHENGODE
18me06@scteng.co.in

R.GOKULA KANNAN
B.E/MECHANICAL ENGINEERING
SENGUNTHAR ENGINEERING
COLLEGE
(AUTONOMOUS)
TIRUCHENGODE
18me14@scteng.co.in

C.KARTHIKEYAN
B.E/MECHANICAL ENGINEERING
SENGUNTHAR ENGINEERING
COLLEGE
(AUTONOMOUS)
TIRUCHENGODE
18me20@scteng.co.in

N.THIRU SENTHIL ADHIBAN M.E.,
HEAD OF THE DEPARTMENT
MECHANICAL ENGINEERING
SENGUNTHAR ENGINEERING
COLLEGE
(AUTONOMOUS),
TIRUCHENGODE,
nthirusenthiladhiban.mech@scteng.co.in

Abstract— Sand is an important element in the construction of buildings. Sand is utilized in building at many phases, from the foundation to the finishing work. Sieving is a method of separating particles from a mixture based on particle size differences. It uses sieve machine for separation of coarse particles from finer particles. Sieve machine have meshed or perforated bottoms which allow only particles of a specific size to pass through it. In our project is “Design & Analysis of Sand Sieving Machine”, it’s useful to the construction field, but major problem in helical spring vibration. The design created in Creo parametric software and analysis using Ansys software. By using two different heights of the spring, the vibration is improved. To check the natural frequency based on modal analysis Ansys software is used. Finally, it’s compared to the existing model.

I. INTRODUCTION (HEADING 1)

The purpose of a sieving machine is to remove big grains by passing them through a sieve. Separation occurs when sand is put on top of a filter with holes of varied diameters. The first sieving is done to remove sand with a size larger than that of a standard withholding sand filter, and the second sieving is done to remove sand with a size smaller than that of a typical withholding sand filter. small to ignore the sand filter. A sieve is a device that uses a woven screen such as mesh, net, or metal to separate desired elements from

undesired material or to characterize the particle size distribution of a sample.

A machine member, excited by some external source, repeats its motion by itself after a certain interval of time, this motion is called vibration. vibrations can be grouped in to two categories based on the load applied. if a member is blown once with an impact load and allowed to vibrate freely, then it is called as free vibration. if the excitation continues repeatedly, then it is forced vibration. damping the vibrating member is one among the important aspect in vibration control.

The concept of vibration shaker takes the concept of gravity, where the material will tend to go down when there is an empty place. Because the large material will generate a larger gap that can be easily introduced by small material, it will be easier for a little material to reach the lower point of the large

PERFORMANCE ANALYSIS AND EFFICIENCY IMPROVEMENT OF COOLING TOWER AT MTPS-I

Mr. N. THIRU SENTHIL ADHIBAN¹, M. SUKEL AHAMED², S. SUGUMAR³, P. NETHAJI⁴

¹Head of the Department, ^{2,3,4}UG Scholar

^{1,2,3,4} Department of Mechanical Engineering,

Sengunthar Engineering College (Autonomous), Tiruchengode, Namakkal, India.

Abstract - In thermal power station one of the main part is condenser which cools the hot water. When cooling the hot water, it becomes cold water. The how water temperature is reduced by the cooling tower. When hot water enters into the cross flow induced draft cooling tower and sprayed by the nozzle, so that hot water is converted into cold water. The effective cooling water is depends upon wet bulb temperature, dry bulb temperature, size and height. This project deals with analysis of cooling tower which is one of the deciding factors used for the power plant efficiency.

Key Words: Wet bulb temperature, dry bulb temperature, cooling water range, cooling water approach, inlet air and water temperature, outlet air and water temperature etc.

1. INTRODUCTION

The Mettur thermal power station is the Tamilnadu electrical board's inland thermal power facility. Industrial development is critical to the country's economic success. The facility is on Stanley reservoir's left edge, on the Ellis Surplus route. The major goal of the 840MW Mettur Thermal Electricity Station is to meet the power needs of the state of Tamilnadu's industrial centers. Work on the project began in 1981, and the first unit was commissioned in 1987. The last three units were put into service in 1987, 1989, and 1990, respectively.

1.1 SCOPE OF THE PROJECT

The scope of the project is to find the energy conservation opportunities in Mettur Thermal Power Station by following methods:

- To find the various opportunities in cooling tower casing, fan blade material and fan blade angle.
- Through replacement of motors to reduce the current and horse power.
- To optimize the blow down rate.
- To restrict flows through the large loads to design values.
- To increase the cooling tower efficiency.

2. COOLING TOWER

The cooling system conjointly includes any machinery accustomed operate the tower and any tanks, pipes or valves. A cooling is instrumentality accustomed cut back the temperature of the water by extracting heat from water and emitting to the atmosphere. cooling build use to evaporation wherever by a number of the water is gaseous into a moving air stream and afterward discharged into the atmosphere. As a results the reminder of the water is cooled down considerably. cooling square measure able to lower the water temperature over devices that use solely air to reject heat just like the radiator within the automobile and square measure thus most value effective and energy economical. cooling square measure employed in air con system for refrigeration or to cool down materials in industrial processes. cooling square measure devices that use close air to cool down water. A cooling system might contain one or a lot of cooling that use identical recirculating water.

2.1 HOW DOES A COOLING TOWER WORKS?

In a cooling tower system, the fan pushes or attracts air from the atmosphere into the tower to cool down recirculating water. Warm water, that has removed heat from associate air-con, refrigeration or process, enters the highest of the tower. because the water falls through the tower recent air is forced through it. This recent air cools the water. The cooled water then falls to a storage basin before being recirculates through system once more.

2.2 TYPES OF COOLING TOWER

The section describes about the types of cooling tower they are:

Types of draft in cooling tower

- > Natural draft cooling tower
- > Mechanical draft cooling tower
 1. Forced draft cooling tower
 2. Induced draft cooling tower

Types of water and air flow in cooling tower

- Cross flow
- Counter Flow

BED WITH ATTACHED COMMUNE FOR PATIENT AND ELDERERS

Muralikrishnan T
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
muralikrishnan252000@gmail.com

Aravind Kumar P
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
realstararavind42@gmail.com

Mahendran S
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
mahendrans1462001@gmail.com

Mr. P. Jagadeeswaran, ME

Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
pjagadeeswaran.mech@scteng.co.in

Abstract— Aim of this project is to develop a mechanical system for washing urination or defecation of patients in bed. Automatic discharge processing system, can nursing urination or defecation of patients in bed. when the patient excretes, to press the button can perceive automatically, pull out the excrement and smash into pieces, and then store them into dirtily bucket. Then the nozzles spray clean water to clean patient private part and excrement collection bucket automatically.

I. INTRODUCTION

A cot is a generally for rest or sleeping while staying in the same placed. cot to develop a better toileting aid for bedridden patients to replace conventional incontinence products such as absorbent products, indwelling urinary catheters, and bedpans, although without much success. Automatic urine and faeces disposal systems that detect, transport, and store urine and faeces temporarily for future disposal have been developed. For better excretion care, we developed a toilet integrated medical bed that is easy to use for both patients and carers. The toilet basin was incorporated onto the pelvis plate of the bed, and the fluid waste in the toilet basin was collected into a plastic bag through a curved waste storage tube attached to the toilet basin. He was able to urinate and defaecate without the help of a career. Independent urination and defaecation helped restore his dignity considerably. This medical bed with an embedded toilet could be a promising solution for excretion care of bedridden patients.

II. EXISTING SYSTEM Vs PROPOSED SYSTEM

This facility is available only in hospital. It consume more manpower. We proposed system for paralyzed patient for private use. We over come with less Manpower

III. METHODOLOGY

While making cot (5ft) for commode use, first part (1ft) steel designed toward up direction and same procedure followed as downward direction. Mid part (3ft) fitted horizontally. Button turn on to run the motor to push back used enable potions to is it and relax, the seat can adjust 40 to 45 through rack and pinion gear. For commode use, moving plate, move downward through lead commode use, moving plate, moving downward through leads screw by switching on the push button. commode move centre from and it has separate button to on after the usage of patient, wastes collected through the pipe for the disposal. And commode movie through towards the original position and moving plate, moves upward to its initial position

ASmart Aerial Lotus Removing Machine for Lake and River

Pranesh R
Mechanical Engineering
Sengunthar Engineering
College(Autonomous)
Tiruchengode,
Namakkal
1833me@seteng.co.in

Poovarasam R
Mechanical Engineering
Sengunthar Engineering
College(Autonomous)
Tiruchengode, Namakkal
18me32@seteng.co.in

Tamizharasan A
Mechanical Engineering
Sengunthar Engineering
College(Autonomous)
Tiruchengode,
Namakkal
18me4k@seteng.co.in

Mr.p.Jagadeeswaran.M.E.

Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
pjagadeeswaran.mech@seteng.co.in

Abstract— The project emphasizes on design & construction of river and lake cleaning mechanism. The technique has proven to be effective in cleaning floating solid trash from the river's surface. This technique strives to achieve its social goal of cleaning rivers and other bodies of water. Its operating principles are based on the customarily used methods of using conveyors, but it has an alarming alteration to the mechanism to improve its efficiency. However, these approaches are dangerous, expensive, time consuming, and necessitate a large crew. The operated river cleaning machine was developed by taking into account all of the parameters of river and lake surface cleaning systems and eliminating the disadvantages of all of the ways mentioned previously created and built to aid in the effective, efficient, and environmentally friendly cleaning of river surfaces. Water hyacinth is a native of the Amazon Basin and one of the world's most toxic aquatic weeds, according to the study. The development of water hyacinth in temperate, tropical, and sub-tropical waterways is aided by a lack of natural enemies and nutrient-rich water bodies. When the weed's rapid mat-like spread covers areas of fresh water, it produces a slew of socio-economic and environmental issues. The mechanical method is the most cost-effective in terms of control, followed by biological, manual, and chemical methods. The focus of this project is on the design and construction of a river trash cleaning machine. "Aerial lotus River and Lake Cleaning Machine" is a machine that removes waste particles from the water's surface and safely disposes of it. The operation was carried out in response to the current state of our national rivers,

which are dumping crores of liters of sewage and are clogged with pollutants, hazardous compounds, and debris, among other things.

I. INTRODUCTION

The River and lake aerial lotus removing machine used in that places where there is waste debris in the water body which are to be removed. This machine consists of different The size of the fins in which garbage will collect between them. This also lessens the problems we have when collecting debris. In this machine, one end of the fins is fixed and the other is movable; we lift the fins from the moveable side using servo motors. All of the waste debris is collected in a tank near the boat's stern. This will eventually result in less water contamination and, as a result, fewer aquatic animals will perish as a result of these issues. This project will be used to clear surface water debris from bodies in rivers, ponds, lakes, and other water bodies. Aquatic weeds are uncontrolled plants that develop and finish their life cycle in water, causing direct and indirect harm to aquatic ecosystems and related eco-environments. Water is one of the most vital natural resources on the world, and it serves as the foundation for all life forms. Pumps and turbines in super thermal and hydroelectric power plants can be damaged by aquatic weeds, lowering electric production and increasing power plant maintenance costs. Many aquatic plants are valuable because they have the potential to reduce agricultural, residential, and industrial pollution for a limited time. Many aquatic weeds have the potential to assist fish production by supplying a steady supply of phytoplanktons. The aquatic plant's phytoremediation capability can be further boosted by using cutting-edge phytoremediation techniques. In order to show the extensive applicability of phytoremediation, a summary assessment of the use of aquatic plants in phytoremediation has been compiled. The selection of plants species is the most significant aspect for successful phytoremediation.

II. EXISTING SYSTEM

DESIGN AND ANALYSIS OF GOODS ELEVATOR

S.Karthick
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me19@scteng.co.in

P.Nisanth
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me30@scteng.co.in

L.Vaishnavi
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me50@scteng.co.in

Mr.C.Mohankumar,M.E...
Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
cmohankumar.mech@scteng.co.in

Abstract—In our project to design the goods elevator based on cabin. It's useful to the transportation of component one place to another place in manufacturing industry. The conventional steel cabin is replaced by new steel model design. The Goods lifts design created in Solid Works software and structural analysis in Ansys software.

1.INTRODUCTION

Many developments have happened in recent years in industries such as manufacturing, computing, and software. They have made great advancements in a variety of fields. By pushing the switch or button, you call a metal box that transports you from one floor to another with safely. In fact, an elevator is mandatory for a building which has more than four to five floors high. This article discusses about goods elevator and how does it works.

2.PROBLEM IDENTIFICATION

Total load of goods lift is carrying on the cabin it leads to material deformation and to crack.

So, the cabin material to need the maximum capacity, so conventional structure of cabin replaced by the proposed model. This new model is proposed for lifting load is easily on material transportation.

3.MATERIAL SELECTION

Steel is made up of carbon and iron, with much more iron than carbon. In fact, at the most, steel can have about 2.1 percent carbon. Mild steel is one of the most commonly used construction materials. It is very strong and can be made from readily available natural materials. It is known as mild steel because of its relatively low carbon content.

4.MODELING

All of the processes that lead up to the deployment of excellent software have modeling as a major component. Models are created to communicate our system's desired structure and behaviour. The architecture of the system is visualised and controlled using models.



Design and Analysis of Jet Nozzle in Laser Cutting Machine

Mr. C Mohankumar¹, B Arun², N Ponnugil³, J Santhoshkumar⁴

¹ Assistant Professor, ^{2,3,4} UG Scholar,

^{1,2,3,4} Department of Mechanical Engineering,

Sengunthar Engineering College (Autonomous), Tiruchengode, Namakkal, India.

Abstract: Due to the ultra-flexibility of the cutting conditions, high quality end product, quick set up, non-mechanical interaction between the work piece and the tool, and tiny size of the heat affected zone, lasers are frequently utilised in industry for cutting tools. Copper is a common material for nozzle manufacturing. Because copper is a more expensive material, the material selection process is done to find the most cost-effective material for the nozzle. The various materials (Brass and Nickel) based on the temperature and heat flux values obtained from the thermal analysis. The optimal material for jet nozzle is determined based on the thermal analysis results, and the material is advanced through the implementation phase.

1. INTRODUCTION

In the 1970s, lasers were initially employed for cutting. Laser cutting is more commonly utilised in current industrial manufacturing in sheet metal, plastics, glass, ceramics, semiconductors, and materials such as textiles, wood, and paper. The use of laser cutting in precision machining and micro-machining will expand significantly in the next years.

The irradiation region warms up quickly as the concentrated laser beam meets the work item, melting or vaporising the material. The cutting process begins when the laser beam penetrates the work item; the laser beam proceeds along the contour and melts the material. A jet stream is typically employed to blow the melt away from the incision, leaving only a small gap between the cutting section and the frame.

2. LASER CUTTING METHOD

2.1 Fusion cutting

The work piece is partially melted during laser fusion cutting, and the molten material is expelled by airflow. The procedure is known as laser fusion cutting since the material is only transferred in its liquid condition. The laser beam is accompanied by a high purity inert cutting gas that allows the melted material to exit the slot, but the gas does not cut. Laser fusion cutting can cut at a faster rate than gasification. Gasification requires more energy than melting. The laser beam is only partially absorbed in laser fusion cutting.

2.2 Vaporization cutting

The surface temperature of the material gets to the boiling point so quickly during laser gasification that it avoids melting due to heat conduction. Some of the material vaporises into steam, while others are blasted away by the supplementary gas flow from the slit's bottom. A very high laser power is necessary in this instance. The thickness of the material must not exceed the diameter of the laser beam to avoid material vapour from condensing into the slit wall. This method is only appropriate for applications that need the removal of molten material. It is only used in a few places for ferrous alloys.

2.3. Fracture-controlled cutting

Fracture-controlled cutting uses high speed and controllable laser beam heating to cut fragile materials prone to heat damage. The following is the primary element of this cutting procedure: The laser beam warms a small area of fragile material, generating a significant thermal gradient and severe mechanical deformation in the area, leading to material cracking. The laser beam can guide the fractures in any desired direction as long as the balanced heating gradient is maintained.

2.4 Oxidation melting cutting

In most cases, an inert gas is used for melting cutting. When employing oxygen or any reactive gas, the material was lighted by the laser beam and violently reacts chemically with oxygen, producing another source of heat and further heating the material. This is known as oxidation melting cutting. Because of this effect, cutting speed for structural steel of the same

DESIGN AND ANALYSIS OF MULTIFACE HYDRAULIC BENDING MACHINE DIE

A.G.DEEPAK NAARAYAN¹, M.ARULKUMARAN², R.KISHOREKUMAR³, Mr. S.MURUGESAN⁴

^{1,2,3} UG Scholar, ⁴ Assistant Professor

^{1,2,3,4} Department of Mechanical Engineering,
Sengunthar Engineering College(Autonomous), Tiruchengode, Namakkal, India.

ABSTRACT: The project is about designing a bending die for a Hindustan Hydraulic Press Brake machine. The company is Craft Engineering, and it is located in Malumichampatty, Coimbatore. It has been assigned the project of designing and manufacturing tools. The old design was ineffective. The component formerly required a larger number of dies for bending in the production process. The production cycle time is increasing, which necessitates greater room. Various causes were identified and solutions were developed using data gathered from the industry during this research. Component, formatting, style, styling, and insert are all keywords.

1. INTRODUCTION

In most cases, a die is installed in the press brake during bending. This is a channel-like portion that is stationary. The bend that will be formed is defined by the outside shape of the die. With the use of clamps, a tool is mounted to the machine's ram and has rounded edges that produce the bend's interior shape. The bending force is created by the punch, which is a moving part. The tool descends, applying pressure to the sheet metal. When the pressure exceeds the plastic limit of the sheet metal, the sheet metal goes through a plastic deformation stage and takes the shape of the die beneath it. The punch then goes upwards for the next cycle once the process is completed. This is it.

2. MACHINE DIE METHOD

2.1. SHEET METAL BENDING

The process of bending a metal is termed as bending. Sheet metal, tubes, square hollow, rod, and iron angle are all options for the metal. This metal has a thickness of its own. Several factors are taken into account while building bending machines, including the type of metal, the type of roller bender (power or manual), and the size of the bending machine. The capacity of the bending machine that can bend a sheet metal or tube is usually the only variation between different types of bending machines.

2.2. NEED OF AUTOMATION

The majority of the systems designed for bending dies necessitate the assistance of qualified and experienced die designers in making proper selections at various phases of process planning and die design. Most bending die design automation prototypes still suffer from the drawbacks of traditional expert system architecture and are unable to efficiently manage diverse information sources. Many studies have looked into using the finite element method (FEM) to optimise bending die design parameters. These methods, however, are impracticable for the planning and design stages of the deep drawing process due to the considerable calculation time and skill necessary to grasp the findings. Most sheet metal industries are currently experiencing a severe lack of experienced die designers. Furthermore, in the stamping industry, the mobility of experienced die designers has resulted in Sheet metal businesses all across the world are experiencing a great deal of difficulty.

2.3 V-BENDING

The most frequent punch and die bending method is V-bending. Bottoming, air bending, and coining are the three subgroups. Around 90% of all bending jobs are done with air bending and bottoming. According to the material thickness t , the table below can help you determine the minimum flange length b (mm) and inside radii ir (mm) (mm). You may also see the required die width V (mm) for such specs. A certain tonnage per meters is required for each process. This is depicted in the table as well. As you can see, thicker materials and narrower interior radii necessitate higher tonnage. The highlighted options are metal bending standards that are recommended.

DESIGN & ANALYSIS OF CONCRETE MIXTURE DRUM SHAFT

V.Sivasankari
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me43@scteng.co.in

D.Logesh kumar
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me24@scteng.co.in

R.Thavasiyappan
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me49@scteng.co.in

Mr.S.Murugesan,M.E.,
Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
smurugesan.mech@scteng.co.in

Abstract— *The investigation, design modification, and analysis of a concrete mixer drum shaft are all included in this work. Concrete mixer machines are commonly used to manufacture concrete mixtures for use in construction and industries, such as concrete blocks, pipes, and sheets. The concrete mixture drum shaft was used in our project. The deformation, stress, strain, and safety factor of several materials (mild steel, carbon steel, and stainless steel) used to examine drum shafts. With the help of the Ansys programme, select the best material for the concrete mixture drum. As a result of the growing human population and the constant demand for housing, the construction and building industries are expanding on a regular basis.*

1. INTRODUCTION

Concrete, which is formed of cement, aggregates (gravel, sand, or rock), water, and admixtures, is one of the most demanding construction materials. Concrete ingredients are predesigned in order to get the finest possible quality. There is a risk of receiving very poor quality concrete if the elements are not combined properly or in the pre-determined proportions. Concrete mixers are machines that aid in the mixing of concrete and concrete paste materials into an useable state. In other terms, the mechanical concrete mixer, or simply

the concrete mixer, is the machine that is used to mix concrete.

2. TYPES OF CONCRETE MIXERS

There are two broad types of concrete mixers:

1. Batch mixers

a. Drum Types Mixer

- Tilting drum mixers
- Non-tilting drum mixer
- Reversing drum mixer

b. Pan Type Mixer

2. Continuous mixers

3. OBJECTIVE

The major goal of this project is to improve the drum shaft's durability and resolve several technical concerns. The mixer drum shaft has been proposed with composite fibre material. For the proposed new material, the present material (mild steel) is replaced by stainless steel and carbon steel materials. The structural analysis of this new mixer drum shaft should be performed using ANSYS software.

4. PROBLEM IDENTIFICATION

Some issues have been observed in mixer drum shafts that have been damaged as a result of variables such as material corrosion, material wear (crack) from prolonged use, and continued load. As a result, the mixer drum shaft has a short lifespan. To solve this

AUTOMATIC WATER TANK CLEANING MACHINE

A.M.Keerthivasan¹, B.Keerthikaran², T.Mouneshkumar³, Mr.N.Saravanan⁴

^{1,2,3} UG Scholar, ⁴ Assistant Professor

^{1,2,3,4} Department of Mechanical Engineering,

Sengunthar Engineering College(Autonomous), Tiruchengode, Namakkal, India.

Abstract— The goal of this project is to create a mechanical cleaning solution for home cylindrical water tanks. The mechanical system consists of a gear mechanism and brush adjustment linkages. PVC brushes are affixed to the connections' ends and bases. When the motor is turned on, the linkage connection rotates, causing the brushes attached to it to rotate, cleaning the tank's wall and base. The goal of this research is to reduce human labor while also avoiding toxic effects on the health of those who enter the tank for cleaning.

1. INTRODUCTION

According to recent studies, no automation-based machine is employed in the cleaning of overhead tanks. This is due to the tank placements' uneven shape and varying heights. With the results of the previous survey, an attempt was made to create a machine that would clean the tank using an automated procedure. An answer has devised a strategy for resolving the issue. Sintex tanks are used by around 71 percent of population in India. After doing research, it was discovered that workers have experienced numerous challenges, including continuous employment in filthy environments, irregular payment, and other factors. This endeavor could also be motivated by continuous work and sporadic salary. As a result, we came to the conclusion that cleaning the overhead tank utilising an automatic approach could be beneficial in resolving all of these issues. In this instance, the equipment is capable of cleaning the tank swiftly and easily. Electrical and Electronics Engineering Department.

2. EXISTING SYSTEM Vs PROPOSED SYSTEM

The goal of this research is to reduce human labour while also avoiding toxic effects on the health of those who enter the tank for cleaning.

Tank cleaning in a mechanical system is meant to give high safety, high efficiency, reduced cleaning time, and eliminate environmental contamination issues.

3. METHODOLOGY

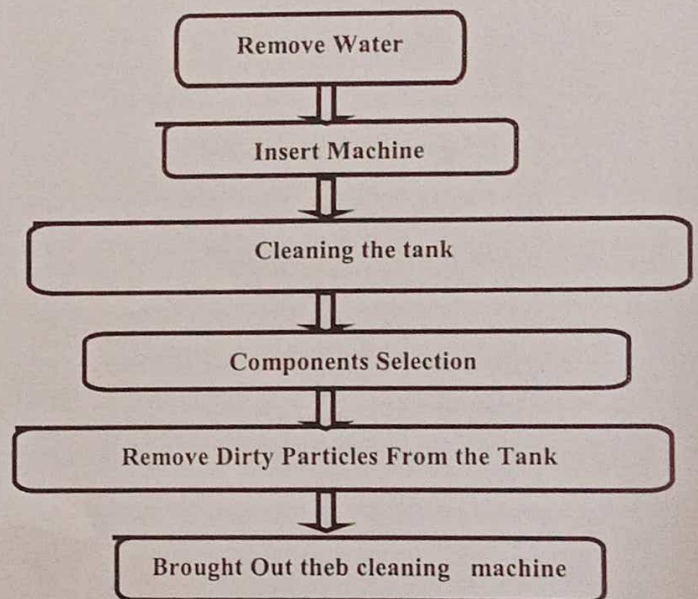


Fig : Methodology

The tank's whole contents are first removed. Detergent is then put on the tank's inner wall to make dirt removal easier. The cleaning arrangement is mounted on a frame near the water tank's opening, and manual rotation is given by a hand lever connected to a pinion gear that rotates in a clockwise manner. This causes the rack, which is attached to it, to move linearly downward, allowing the cleaning arrangement to enter

DESIGN AND FABRICATION OF FUEL FROM PLASTIC WASTE

B.Aravindh
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
aravindh5062001@gmail.com

D.Barath
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
dbarath9062001@gmail.com

Y.Ragavan
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
yragavan2001@gmail.com

Mr.N.Saravanan,M.E.,
Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
nsaravanan.mech@scteng.co.in

ABSTRACT-

Plastics have been ingrained in our daily lives and are now posing a significant environmental hazard. Plastics are produced in excess of 100 million tonnes per year around the world, and used products have become a common sight in overflowing bins and landfills. Despite efforts to develop futuristic biodegradable plastics, there have been few definitive steps toward resolving the current challenge. The method of transforming waste plastic into value-added fuels is described in this article as a possible alternative for plastic recycling. Pyrolysis occurs in the absence of oxygen and at a high temperature of around 300°C, which is why a reactor was built to generate the requisite temperature. Converting waste plastics into gasoline has a lot of potential in terms of both the environment and the economy. As a result, the process of converting plastics to gasoline has turned challenges into opportunities to gain money from waste. Oil from plastic conversion provides two advantages. First and foremost, the oil produced can be utilised as a home fuel as well as in automobiles and industry after additional refinement. Second, the many types of contamination that waste plastics generate can be reduced.

I. INTRODUCTION

Plastic was invented in 1860, but it was only in the last 30 years that it became widely used. Plastic is light, durable, adaptable, and hygienic. Polymers are lengthy chains of molecules that make up plastic. When a naturally occurring substance, such as crude oil or petroleum, is changed into another substance with radically different

qualities, polymers are created. These polymers can be produced into granules, powders, and liquids, which can be used as plastic product materials. According to a statewide assessment done in the year 2000, India produced around 6000 tonnes of plastic, of which only 60% was recycled and the remaining 40% could not be disposed of. Plastics are produced in excess of 129 million tonnes per year around the world, with 77 million tonnes coming from petroleum.

II. PREPARATION OF FUEL FROM WASTE PLASTIC

Pyrolysis is the controlled burning of plastic waste into fuel. It is a method of heating materials in the absence of oxygen. The plastic polymer's macromolecular structure is broken down into smaller molecules. The presence of a catalyst, residence time, temperature, and other process factors can all tell us if the molecules of plastic waste can be further degraded or not. Catalytic pyrolysis refers to pyrolysis that takes place in the presence of a catalyst, whereas thermal pyrolysis refers to pyrolysis that occurs naturally without the use of a catalyst. Although, there are numerous methods for managing plastic trash, such as recycling, land filling, and depolymerization. HDPE, PP, PE, and LDPE are the most common plastics utilised in this process, and they are all transformed into fuel. These are the types of plastic that are abundant on our world. The method of transforming plastic into fuel is detailed in further detail. We'll need a container to hold all of the waste plastic that will be burned in order for the pyrolysis process to take place and convert the waste.

Design and Analysis of Cardan shaft

K.Gokul
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me13@scteng.co.in

K.Mohanraj
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me26@scteng.co.in

S.Sathish
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me42@scteng.co.in

Mr.C.Ramesh kumar,M.E.,
Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
crameshkumar.mech@scteng.co.in

Abstract— A cardan shaft is a rotating shaft that transmits power from the engine to the differential gear of a rear-wheel-drive vehicles cardan shaft must operate through constantly changing angles between the transmission and axle. Because of the continuous rotation, high vibration is occurred on it. Due this problem shaft tends to bend or deform .Major problem in cardan shaft is vibration. The design created in Creo parametric software and analysis using Ansys software. To check the natural frequency based on modal analysis in Ansys software. Finally, it's compared to the various shaft cut-out geometry.

INTRODUCTION

The joints connect the cardan shaft to the gearbox, which are in charge of distributing torque from the transmission to the driving wheels at a steady pace. A variety of factors might produce vibration in a cardan shaft. Wearing U-joints or slip splines, out-of-balance components, yokes out of phase or misaligned angles, approaching critical speed range, and yoke ears that are not concentric with the splines are all typical causes of driveline vibration.

EXISTING SYSTEM

MR-based four-wheel-drive vehicles and vehicles with a short distance between the engine and axles.

The friction welding used at the junction contributes to the connection's increased strength, quality, and durability.

Vehicles with a considerable distance between the engine and the axles, as well as front engine front drive base four-wheel-drive vehicles, use it.

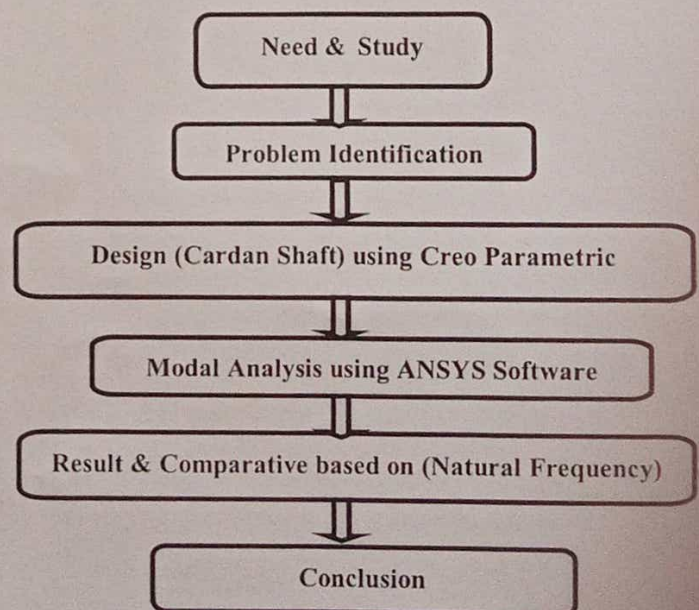
When the cardan shaft is divided into two or three segments, the critical number of revolutions is reduced, which prevents

vibration issues when the shaft's overall length is increased.

PROPOSED SYSTEM

Almost all automobiles and locomotives have transmission shafts. The Weight reduction of the cardan (drive) shaft can have a certain role in the general Weight reduction of the vehicle and is a highly desirable goal, if it can be achieved without increase in cost and decrease in quality and reliability. It is possible to achieve design of modified cardan shaft with less weight to Increase the natural frequency of the shaft and to decrease the bending stresses using various stacking sequences.

METHODOLOGY



Design and Analysis of Concrete Mixer Drum

V. Jeevaandham
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me17@seteng.co.in

M.S. Sabesan
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me19@seteng.co.in

R. Saran
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me41@seteng.co.in

Mr. C. Ramesh Kumar, M.E.,
Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
crameshkumar.mech@seteng.co.in

ABSTRACT— Drum type concrete mixers are important part of the concrete mixers available today. They are most suited for small to large capacity machines. The ingredients for concrete (aggregates, sand, cement, and water) are combined inside the rotating drum. But it's not as simple as it appears; inside the drum, there are specially built flights that aid in mixing and unloading the contents. In our project is concrete mixture drum with blade optimization design creating in Creo parametric software and structural analysis using in Ansys software. The different material check drum based on deformation and safety factor. To choose the better material of concrete mixture drum with help of Ansys software

INTRODUCTION:

Concrete, which is formed of cement, aggregates (gravel, sand, or rock), water, and admixtures, is one of the most demanding construction materials. Concrete ingredients are pre-designed in order to achieve the highest possible quality. There is a risk of receiving very poor quality concrete if the elements are not combined properly or in the pre-determined proportions. Concrete mixers are equipment that aid in the mixing of concrete materials and the creation of a workable concrete paste. In other terms, the mechanical concrete mixer, or simply the concrete mixer, is the machine that is used to mix concrete.

EXISTING SYSTEM:

The mild steel material is used in concrete mixer drum. The mixer blade is placed in some length and radius at inside of drum. The efficiency is less in drum and blade.

PROPOSED SYSTEM:

Some excess of concrete as waste at rotating time. The carbon fiber material is used in concrete mixer drum. Change in length and radius of mixer blade. To improve high efficiency. To shortage the excess of concrete.

METHODOLOGY:

The main objective of this project work is to improve durability of drum and overcome some technical issues. The composite fibre material has proposed to the mixer drum. The material CFRP is chosen as raw material for proposed new material. This new mixer drum should be analysed structurally by using ANSYS software.

CARBON FIBRE:

Carbon Fiber, often known as graphite fibre, is a polymer. It is an extremely robust and lightweight material. Carbon fibre is five times stronger and two times stiffer than steel. Carbon fibre is stronger and stiffer than steel, but it is also lighter, making it a perfect production material for a variety of items. These are just a handful of the reasons why engineers and designers prefer carbon fibre for manufacturing. Carbon fibre is a material made up of tiny, strong crystalline carbon filaments that are used to reinforce it. Carbon fibre can be as thin as a strand of human hair and is twisted together like yarn to give it strength. The carbon

Design and Analysis of Concrete Mixer Drum

V. Jeevanandham
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me17@scteng.co.in

M.S. Sabesan
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me39@scteng.co.in

R. Saran
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me41@scteng.co.in

Mr. C. Ramesh Kumar, M.E.,
Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
crameshikumar.mech@scteng.co.in

ABSTRACT— *Drum type concrete mixers are important part of the concrete mixers available today. They are most suited for small to large capacity machines. The ingredients for concrete (aggregates, sand, cement, and water) are combined inside the rotating drum. But it's not as simple as it appears; inside the drum, there are specially built flights that aid in mixing and unloading the contents. In our project is concrete mixture drum with blade optimization design creating in Creo parametric software and structural analysis using in Ansys software. The different material check drum based on deformation and safety factor. To choose the better material of concrete mixture drum with help of Ansys software*

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VIBRATION ANALYSIS OF BLOCK MAKING MACHINE

S Dhanasekar ¹, G Deepak ², K Jeenath Kumar ³, **Mr.G.Chandramohan ⁴**

^{1,2,3}UG Scholar,⁴Associate Professor

^{1,2,3,4} Department of Mechanical Engineering,

Sengunthar Engineering College(Autonomous), Tiruchengode, Namakkal, India.

Abstract: *There have been a succession of building collapses in this country for some time now. The cause for this is due to the poor quality of the construction materials used. The adoption of a block-making machine will aid in the production of more solid, high-quality blocks in a shorter period of time, hence reducing the problem of collapsed buildings in our country. Blocks can usually be moulded by hand, but the importance of using a machine cannot be overstated because it allows for a simpler, faster, and less expensive method of making blocks. Block making machines are available in a variety of designs, styles, shapes, and sizes. No other concept or device has had as much of an impact on production as compute. Computers are used in all engineering fields for calculation, analysis, design, and analysis. Product producers must consider making two products during the Manufacturing phase of the product's lifecycle: the physical products that they have always created and the virtual product, which is information about the physical product. This virtual product has the potential to supply producers with a new source of revenue. The goal of this project was to design, develop, and analyse a block forming machine frame in order to create a more efficient and versatile machine.*

1.INTRODUCTION

The goal of the proposed project is to create a product that benefits society through its use, reduced energy consumption, and the development of small-scale companies and agriculture.

2.LITERATURE REVIEW

Paving block moulding equipment has been designed and produced to match the production parameters, according to Ella Sundari et al. (2020). The maximum number of paving blocks that may be manufactured per day using a paving block moulding tool is 640.

Prasad et al. (2017) assist in the development of a product that uses less electricity and labour. The use of coir pith product can prevent plant development during the summer season, in arid terrain, and when there is a mineral deficit in the soil.

The concrete block producing machine was designed by Yemane Zemicheal and Qi Houjun (2020) to produce four blocks at once. It may also make five blocks at once by

adjusting the mould and tamper assembly to the required size. In addition to the compacting vibrating mechanism, the weight of the machine is taken into account while designing it, as well as the staff required to move it and the convenience of operation. The enhanced machine can produce hollow blocks both inside and outside of halls; all that is required is a levelled concrete floor. It can be made locally and with readily available materials.

Yakubu and Umar (2015) devised a multipurpose brick/block producing machine based on standard design calculations, which they subsequently built using simple fabrication techniques. The equipment was then utilised to manufacture inexpensive and high-quality bricks and blocks in accordance with the African Regional Standard for compressed earth blocks and the Nigerian Building and Road Research Institute (NBRRI) standard. The mould must be converted to a moveable mould that can hold pallets in order to make hollow masonry units. The machine, particularly the feeding and evacuation components, might be automated (mechanism). This will improve its performance as well as the operator's safety.

Rufus ogbuka Chime et al. (2016), recommend that the movable parts of this machine like the lifting arm be oiled properly before usage for easy movement since they carry heavy load. That the machine must be properly installed, balanced before usage to withstand the vibration involved. The pulley, lifting arm and the vibrator should be inspected before usage. The machine must be properly cleaned after the normal daily work to be free from sand and cement which can attack the parts and destroy them or the sand also causing friction in the machine. The combination of human creativity with computer technology provides the design efficiency that has made CAD such as popular design tool. CAD has allowed the designer to bypass much of the normal drafting and analysis that was previously required, making the design process flow more smoothly. In fact, software design should be encouraged in our institution of higher learning base on the following facts, long product development, countless trial and error and accountability and limited profitability.

DESIGN AND FABRICATION OF VEGETABLE CUTTER MACHINE

Mr. G. CHANDRAMOHAN¹, M.E., V. RAGHUPRAKASH¹, L. SABARESHWARAN², K. TAMILARASAN^{3, 4}

Abstract

In the engineering sector, automation was all the rage. The examination into the present vegetable cutting machine looks at the disadvantages of manual processing, such as the high investment cost, contamination, additional labour, and time consumption. The pressure block is actuated by a pneumatic cylinder and has a reciprocatory motion along the vertical length of casing, while the cutting grid remains fixed, in this setup. The air supply to the cylinder is controlled by a microcontroller-controlled solenoid-actuated DCV. A pneumatic cylinder and a single bar mechanism govern the entry of vegetables into the grid system. Vegetables are fed by an angled tube. After the vegetable pieces have been processed, a tray is placed at the bottom of the equipment to collect them. The microcontroller controls the pressure level for cutting different vegetables. The type of veggies that such a system can process adds to its complexity. Because present automation is expensive and consumes a lot of energy, the system is advantageous. Pneumatic power, which is plentiful, is advantageous to the suggested work.

1. INTRODUCTION

Automation was all the rage in the engineering profession in the late 1990s. The brightest brains came together at all hours of the day and night to create big advancements that would have an influence in everyday life. Automation is now used in a variety of disciplines, including manufacturing, food processing, biomedical, and pharmaceutical industries. Domestic applications have also been designed with the ordinary man in mind in such a scenario. Processes that were formerly manual are gradually being changed to semi-automated and automated nature. Manual vegetable cutting is still common in educational institutions' dormitories, wedding catering services, and even restaurants that cater to a wide range of customer tastes and preferences. The quantity of vegetables to be sliced for the dishes is always greater than what is actually consumed. The related challenges, such as time constraints, contamination, and so on, make it difficult for anyone in charge of the job. Therein, arose a need to automate the process of vegetable cutting, and here we are with a proposal which can aid in easing the load off the people associated with it.

Existing automated vegetable cutter and its demerits

The automatic vegetable cutter is a Chinese manufactured one, currently available in the market. The cutter operates on the concept of 'rotating grid', wherein, the cutting grid is rotating inside a casing, powered by an ac motor. The vegetables are fed via the hopper arrangement, at the top. The cutting grid rotates at a high speed which cuts the vegetables as they pass through them. The cutting grids are varied according to the need of the customer. The shapes of the cut vegetable vary with the change in cutting grids.

The above-mentioned cutter has a few flaws in terms of functioning. To begin with, vegetable feeding is not automatic; instead, a person must dedicate time to feeding each vegetable individually until the proper quantity is sliced. The grids are then powered by a motor that consumes a lot of energy. The fact that the process must be electrically supplied continually for operation due to the variable power source is a drawback in and of itself. The initial investment in the cutter is the most critical factor. The cutter is estimated to cost between \$ 3500 and \$ 3500, including delivery and taxes. For individuals who manage a mid-level catering business, it is a significant investment. In light of all of these flaws, the concept for a pneumatics powered cutter is conceived.

The high cost of the existing automated system, power fluctuations, additional labour, time consumption in manual cutting, and the possibility of contamination in manual cutting are some of the primary challenges that were highlighted for the start of this operation.

Objectives

The fundamental goals of this research are to provide an alternative to the existing automated system, focusing on the initial investment component, and to power a home product with pneumatics, removing the associated challenges of manual vegetable cutting.

ANALYSIS OF FUEL TANK AND HOSE CLEANING IN GENERATOR

Giri.t
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
19lme01@scteng.co.in

Gowrisankar.s
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
19lme02@scteng.co.in

karthi.s
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
19lme03@scteng.co.in

Mr.C.Karthick.,M.E

Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
nsaravanan.mech@scteng.co.in

Abstract— The attached report, titled "Advanced Algorithm Development and Implementation of Enclosed Operation Detection and Shutoff for Portable Gasoline Powered Generators," summarises the findings of research conducted by the University of Alabama College of Engineering (UA) under a contract agreement with the United States Consumer Product Safety Commission (CPSC). 2 This study was conducted in support of the Consumer Product Safety Commission's (CPSC) advance notice of proposed rulemaking (ANPR) to address the carbon monoxide (CO) poisoning risk linked with the usage of portable generators.

I. INTRODUCTION

This is the project's final technical report, *Advanced Algorithm Development and Implementation of Enclosed Operation Detection and Shutoff for Portable Gasoline Powered Generators*. 1 The University of Alabama (UA) completed this project for the Consumer Product Safety Commission of the United States (CPSC). The project is a follow-on to contract CPSC-S-06-0079, which required UA to develop, test, and install an automatic engine shutoff (or shutdown, as the case may be) feature on a prototype generator built to operate with the same stoichiometric fuel control strategy and catalyst as the durability-tested prototype described in [1]. The purpose of this feature is to shut the engine off before the generator

creates an unacceptable carbon monoxide (CO) exposure environment in the possible event that, when the prototype generator is operated in an oxygen depleted environment, its ability to meet its target CO emission rate is compromised.

II. ENGINEMANAGEMENT SYSTEM

It is vital to note that specific trade names (e.g., Nova, Labview, Matlab, etc.) or business products are stated throughout this book to sufficiently define the experimental processes and equipment used before moving on to the implementation details and experimental protocols. In no event does such identification imply University of Alabama staff sponsorship or recommendation, nor does it imply that the equipment is the best available for the job. The engine management system (EMS) of a gasoline-powered engine is designed to handle a variety of duties, including tracking engine position and synchronising fuel and spark timing. The engine control unit (ECU) is an electronic system with many inputs and outputs that improves engine performance. The ECU is responsible for controlling associated outputs to accomplish desired engine functioning and for executing pre-programmed computations based on data provided by engine sensors. The modular ECU's various inputs and outputs are detailed in the table below, which is comparable to the I/O list from the previous system.

METHODOLOGY:



Lung Cancer Prediction Using Machine Learning Technique Over Big Data

T. Thangarasan^{1*}, R. Keerthana², M. Arunkumar³, S. Ramya⁴,
M. Bommy⁵, V. Surendhiran⁶

Abstract

In current position, cancer disease is substantial menace to human life globally. 32 percent of people worldwide are affected by various types of cancer. But lung cancer depicts the highest ratio. Nowadays peoples are not having awareness about to detect the cancer in early stage. The survival rate of five year for lung cancer disease is 55 percent of the cases are affected most. However, only 14 percent of lung tumor cases are diagnosed at an early stage. For slight tumors the five-year survival rate is simply 3 percent. There are 4 stages in lung cancer. If we predict the disease in I and II stage, it is easy to cure by effortless operations. If it exceeds second stage, it may not be cured. So, diagnosing the cancer in earlier stage is the best solution to predict the patients from death. For that, the system uses the Decision Tree and K-Nearest Neighbor (KNN) Algorithms as preferred classification model. By using these algorithms, it becomes easier to diagnose the cancer in early stage. So, the survival rate of lung cancer patients becomes higher. The propound system analyze, calculate and compares the precision of Random forest, Naive Bayes and KNN and the preliminary result reveals that ID3 furnish better precision for cancer dataset. The input has been accessed only in numeric format. The algorithms also maintain key stuffs of the dataset, which are predominant for extracting performance, and so it may warrant the correct defense and effective preservation. This leads to protection of any extracting works that depends on the sequence of distances between objects, such as Random forest, Naive Bayes -search and classification, as well as many visualization techniques. In particular, it establishes a restricted isometric property, that is the tight leap on the shrinkage and enlargement of the original distances.

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Key Words: Lung cancer, Decision Tree, KNN, ID3, Naïve Bayes

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Introduction

Big data is a term which is used to manage and analyze the large quantity of data which is not able to deal by the traditional software systems. Every day there is billions of data are generated from various factors such as e-commerce websites, social media, hospitals etc. Big data plays an important role

to analyze these data with more effectiveness and provides the best result. Big data techniques are used to work with the effective performance of surgery strategies, other medical tests, and also to discover the relationships among very rushed medical, clinical and diagnosis data. In the field of health sector, the facility for doctors had introduced various data chassis with an enormous amount of

Corresponding author: T. Thangarasan

Address: ¹Assistant Professor, School of Computers, Assistant Professor, Madanapalle Institute of Technology & Science, Madanapalle, Andhra Pradesh, India. ²Assistant Professor, Department of Computer Science and Engineering, K.S.R College of Engineering, Tiruchengode, Namakkal, Tamil Nadu, India. ³Assistant Professor, Department of Electronics and Communication Engineering, Sengunthar Engineering College, Tiruchengode, Namakkal, Tamil Nadu, India. ⁴Assistant Professor, Department of Master of Computer Applications, M.Kumarasamy College of Engineering, Karur, Tamil Nadu, India. ⁵Assistant Professor, School of Computers, Madanapalle Institute of Technology and Science, Madanapalle, Andhra Pradesh, India. ⁶Assistant Professor, Department of Computer Science and Engineering, Excel Engineering College, Komarapalayam, Tamil Nadu, India
E-mail: thangarasant@mits.ac.in



information to regulate the patient information but regrettably, the effectiveness over hidden information discovering is less because of the data are not mined. In medical sector, the information mining is a term which means to overview and inspect the medical information to envision the condition of the patient's health. So the statistical analysis, machine learning, decision making and database techniques are applied to discover desiring pattern from healthcare data.

Table 1. Stages And Survival Rates Of Lung Cancer Patients In India

| Lung Cancer Stages | Diagnosis Frequency | Five-Year Survival Rate (%) |
|--------------------|---------------------|-----------------------------|
| I | 15% | >70% |
| II | 25% | 35%-40% |
| IIIA | 20% | 25%-40% |
| IIIB | 20% | 4%-7% |
| IV | 45% | <2% |

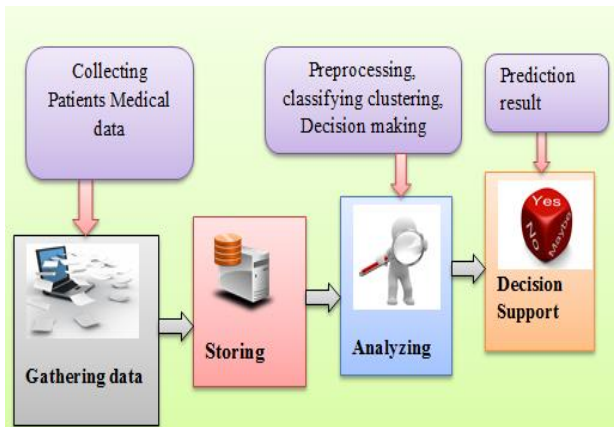


Fig.1. Pipeline process of big data analytics

Fig. 1 explains the schema of disease prediction processing duct which contains various steps of gathering data, storing, reviewing and decision support. Distinct methods of data mining are applied for evaluating these data after gathering enormous amount of health complaint data from various sectors. This analyzing process followed by data preprocessing, then feature selection and certainly it makes the prediction by applying machine learning which may do classification and clustering approaches for those healthcare data.

Lung Cancer Stages And Survival Rates

Lung cancer is the master cause of cancer deaths for both the gender in worldwide. Cigarette smoking, tobacco and genetics is the major risk factor for development of lung cancer. The prognosis of lung cancer is very much least because a doctor not able to find the disease until it reaches severe stage. Because the lung can functioned normally even it is partially damaged. Five-year survival rate in India is around 52% for early stage lung cancer that is localized in the lungs, but only around 3% in advanced, is an inoperable lung cancer.

The stage 1 lung cancer symptoms include lingering or bleeding cough, coughing up or blood, rib ache while breathing deeply, barking cough, raucousness, shortened breathing, wheezing, weakness and dullness, trouble in appetite and weight loss. The stage II lung cancer symptoms are persistent worseness, coughing up blood, shortness in breath, chest pain and back pain, continuous infections like pneumonia and bronchitis. The stage III lung cancer includes pain in the chest, pain when breathing, wheezing, whirling or high pitched sound upon inhalation or exhalation, persistent cough, cough with blood, blood in saliva and mucus, hoarseness or altered voice. The stage IV which is a final serious stage symptom may include a cough that will not get cleared and stacked, out coming of blood or rusty cold while coughing, chest rib ache which may frequently raucous with broad breathing, coughing, raucousness, sudden weight loss and troubles in appetite, compressed breath, tiredness or weak.

Fig. 2 describes the four stages of cancer cell (tumor) development in lung. Stage A is a baseline which describes the minute development of tumor near the lung. In 4 months, the tumor reaches the rib. In 5 months it starts to get grow well and in 8 months it starts to decay the whole lung.

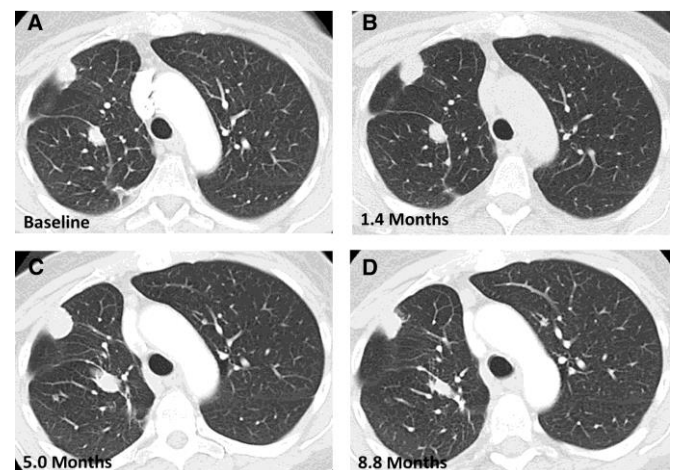


Fig. 2. Lung Cancer Stages



Related Work

There are various exploration that may have benefit of machine learning and extracting techniques are explained beneath.

The research of paper [Andrzej Skalski et al] developed the proposal as segmentation of lung for Computed Tomography data of a particular patient with Lung cancer. Using these regional conclusions, a wholly automated approach of Lung collocation has been introduced. The collocation is based on 73-feature vectors calculated for the lung sector which consist of 3D edge, region, orientation and spatial relational information. For more accurate classification, paper [BendiVenkataRamana et al] has implemented Naïve Bayes classifier and Support Vector Machines for accurate classification. The paper [Cybenko.G et al] has overviewed the classification and regression techniques and makes the comparison over them (SVM provided better accuracy- 79.32%) for blood cancer disease prediction. In paper [Emrana Kabir Hashi et al] system uses the classification models as Decision Tree and K-Nearest Neighbor (KNN) Algorithms. At the end, the proposed system which makes an analysis over it and correlate the certainty between C4.5 and KNN and the overviewed conclusion finalize that the C4.5 gives better certainty for diabetes mellitus diagnosis. For the medical database, the Pima Indians Dataset is used in this exploration. For the automatic prediction, paper [Han Sang Lee et al] proposed an automated process for identifying and fragmenting SRM (small renal mass) in contrast-enhanced CT images by using texture, pixel and context feature collocation and compared their result (accuracy- 77.45%). For classification of CT images of lung cancer, paper [Isabelle Guyon et al] has compared Multi segmented injection Forward Neural Network, J-48, Random Forest and Genetic programs are tested using ILPD (Indian Lung Patient Dataset) Data Set. The paper [Jankishran Pahariyavohra et al] uses, the covering methodology which is recently popularized and it offers an effortless and effective way to find the problem of selecting the variable, nevertheless of the chosen machine learning. Because, the machine learning is referred as a perfect black box and it lend to use of off-the-shelf machine learning software package. This approach consists in using the diagnosis and predicting valuation of a machine learning to evaluate the useful variable subset. In routine, one should define: (i) how to search all possible variable subset space; (ii) how to evaluate the prediction valuation of learning machine to

supervise the search and kept it. To predict the type II blood cancer, paper [John C. Platt et al] has make the comparison over the accuracy of C4.5 used to develop a decision tree. In paper [Rajeswari P et al], it introduces advanced algorithm for coaching the support vector machines: Sequential Minimal Optimization, or SMO.

Proposed Method

The projected KNN based classifier determines nearest values persistently from trained datasets and it works only with numeric and image vector of the Lung cancer dataset. The main advantage of this approach is the perfect predictive working based on symptoms and test diagnostic data of the Lung cancer patients. The proposed approach is used to detect the Lung cancer patients and their stage of cancer affected and the experimental application shows the conclusion of the efficiency of the prospective approach. With the combination to that for reviewing medical care data, important steps of extracting techniques like preprocessing data, change the missing values, feature selection, machine learning and decision support and also in addition naïve Bayes also used for the result accuracy are used in training dataset. Finally the random forest method has been executed on the training dataset of cancer for the classification process.

Step 1: In this proposed system, user (doctor, physician etc.) can insert the attributes like their symptoms, their fantastic doubted symptoms, x-ray images and CT images and also the disease value and these values are added to the system with the help of admin through internet. Then, by applying the machine learning technique, the final result after various decision making and pruning can be shown to user.

Step 2: On the server, there is an allowance for admin to load different disease datasets and suiting various extracting algorithms to train up the set of data. The inputs which are requested by users are assembled and refined on main server to predict the analysis result.

Step 3: For reviewing medical care data, the important steps of big data accessions like preprocess data, replace missing values, feature selection, machine learning, KNN and decision support are evolved for training the data. On the server there are numerous algorithms like ID3 and KNN gets accomplished over trained dataset and gets qualified to segment the data which are given for testing.



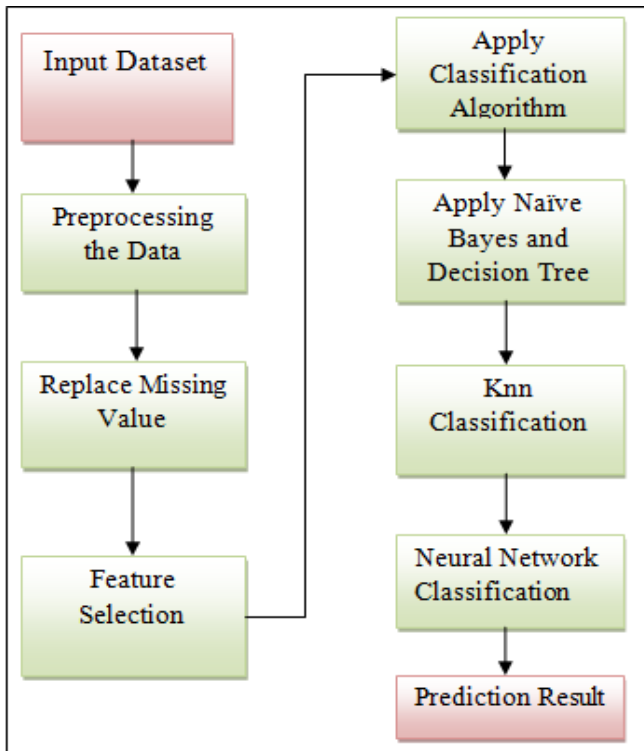


Fig. 3. Architecture Diagram

Methodology

In advanced system, the medical prediction has created on the basis of big data analyzing technique to detect the lung cancer disease. Decision tree, Random forest, Naïve Bayes and K-Nearest Neighbor (KNN) classifiers are used to make the system to train the dataset.

A. Naive Bayesian algorithm

On the basis of Bayes’ theorem the self-subsistence estimate between the predictors done by Bayesian classifier. Naive Bayes classifiers are a family of elementary feasibility classifiers on the basis of applying naïve Bayesian theorem. The anterior possibility $P(c/x)$, from $P(c)$, $P(x)$, and $P(x/c)$ has been thought out with the Bayes theorem. A self-subsistence value of another predictor has been generated by assumption of predictor(x) on the liable class(c) with the help of naïve Bayes classifier. The formula for predicting the tuple ‘x’ related to the class ‘c’ by naïve Bayesian classification is

$$P(c/x) = \frac{P(x/c) \cdot P(c)}{P(x)}$$

$P(c/x)$ is the rear possibility of class target concluder.

$P(c)$ is the earlier likelihood of a class.

$P(x/c)$ is the probability which is the concluder given class.

$P(x)$ is the prior probability of predictor.

B. Decision Tree

[Badr HSSINA et al] Decision tree is a more strong categorization technique. There are various techniques like ID3, C4.5, C5, J48, CART and CHAID algorithms are obtainable to estimate the dataset. Here, there is a continual value in this dataset, so we have chosen ID3 as our perfect classifier. By calculating the topmost information profit in all accredits we can find the decision points.

Pseudo-code for the Decision Tree (T) is declared beneath:

- Step 1: Compute Class Frequency(T);
- Step 2: if One Class or Few Cases
Return a leaf; Create a decision node N;
- Step 3: For Each Attribute A Compute Gain(A);
- Step 4: N. test = Attribute With Best Gain;
- Step 5: if N. test is continuous Find Threshold;
- Step 6: For Each T’ in the splitting of T
- Step 7: if T’ is Empty Child of N is a leaf else Child of N = Decision Tree(T’);
- Step 8: Compute Errors of N; Return N.

C. K-Nearest Neighbor (Knn)

KNN is superintend learning algorithm that finds and recollect radical data based on marginal distance from radical data to the K nearest neighbor. The Euclidean distance is used as a proposal to explain the togetherness.

Pseudo-code for the KNN classifier is stated below:

- Step 1: Input: $D = \{(x_1, c_1), \dots, (x_n, c_n)\}$ $x = (x_1, \dots, x_n)$ radical occurrence to be classified
- Step 2: For each labeled occurrence (x_i, c_i) Calculated $d(x_i, x)$
- Step 3: Order $d(x_i, x)$ from lowest to highest, $(i=1, \dots, N)$
- Step 4: Select the K nearest instances to x : D_x^K
- Step 5: Assign to x the most frequent class in D_x^K

D. Neural Network

Mostly the regression type classification and grouping in data science are done perfectly by artificial neural networks. The feature vectors are grouped into classes and it gets ready for receiving the input from the user and find the label which suits most. This can be worked with its efficiency to label the things, like customer types, images and music genres. In medical science department, these classifiers are frequently used to explore the health of the patients, establish them as regular, unsure, or defective.



The network is a consulting firm of artificial neurons, as same as neuron connection in human brain. It gets trained by experiencing various instances of every class and learns the likeness and contrast by making comparison. This is a routine which is similar as how the brain learnt, with repeated pattern that forms a better association over time. Visual inspection and k-means clustering of data from four aspects proposed seven various means of health. We can take color as an example for our prediction result.

Grey: "early" (starting run-in of the aspects)

Green: "normal"

Yellow: "suspect" (health seems to be crumble)

Black: "failure.S2", "failure. inner" (S3), or "failure.

roller" (S1 and S4)

Violet: "stage2" (secondary failure of S4)

Results And Discussions

A. Dataset

The major Centre for machine learning and artificial intelligent systems from university of California (UCI), Irvine used this dataset for predicting the cancer. There are 600 samples with 8 numerical valued attribute and 400 which gives the negative test and remaining 100 possess the positive instances in this dataset. The attributes which have been selected are explained briefly for cancer data analysis in TABLE II.

Table 2. Training Dataset

| S.No | Training Dataset | Normal Image | Disease Image |
|------|------------------|--------------|---------------|
| 1 | 150 | 55 | 95 |
| 2 | 300 | 74 | 226 |
| 3 | 450 | 116 | 334 |
| 4 | 600 | 124 | 476 |

Table 3. Test Dataset

| S.No | Test Dataset | Normal Image | Disease Image |
|------|--------------|--------------|---------------|
| 1 | 100 | 39 | 61 |
| 2 | 200 | 65 | 135 |
| 3 | 300 | 92 | 208 |
| 4 | 400 | 115 | 285 |

In d detection, sensitivity refers the fraud detection rate and it is defined as

$$\text{Sensitivity} = \text{TP}/\text{N}$$

False Alarm Rate: False alarm rate refers the section of actual negative instances which are predicted as positive instances and it is explained as

$$\text{False Alarm Rate} = \text{FP}/\text{N}$$

Result Comparison

The outcomes of final prediction using machine learning for lung cancer disease are discussed in this part. Here 600 instances of random chosen authentic set of data are used to train the machine

and other 100 precedents are used for testing the data. This prediction system gets matured using three familiar algorithm i.e. Random forest, ID3 and KNN algorithm. The accomplishment of these three algorithms is discussed beneath.

1) Performance Assessment of Random Forest algorithm: While Applying Random Forest classifier, TABLE IV has designed as the preliminary result of analysis. Random Forest classifier makes correct classification over 136 instances and made incorrect classification over 74 precedents. The certainty of perfectly classified precedent is 69.43% and imperfectly classified precedent is 30.57%.



Table 4. Random Forest Classifier

| Random Forest | Prediction result | | Accuracy | |
|---|------------------------------|--------------------------------|------------------------------|--------------------------------|
| | perfect classified precedent | Imperfect classified precedent | perfect classified precedent | Imperfect classified precedent |
| Training instances: 600 Testing instances: 210 | 136 | 74 | 69.43% | 30.57% |

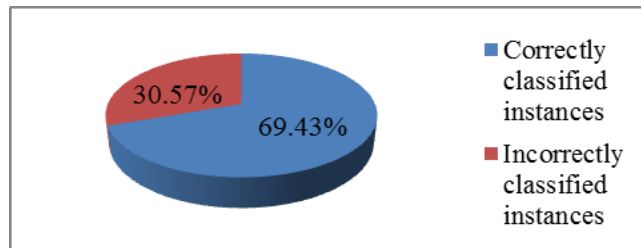


Fig.4. Accuracy chart of Random Forest Classifier

2) Performance Assessment of KNN algorithm: classification over 48 instances. The certainty of While applying KNN classifier, the prevision result perfectly classified precedent is 72.65% and provides, KNN classifier have the correct imperfectly classified precedent is 27.45%. classification over 162 instances and incorrect

Table 5. Knn Classifier

| KNN | Prediction result | | Accuracy | |
|---|------------------------------|--------------------------------|------------------------------|--------------------------------|
| | perfect classified precedent | Imperfect classified precedent | perfect classified precedent | Imperfect classified precedent |
| Training instances: 600 Testing instances: 210 | 162 | 48 | 72.65% | 27.45% |

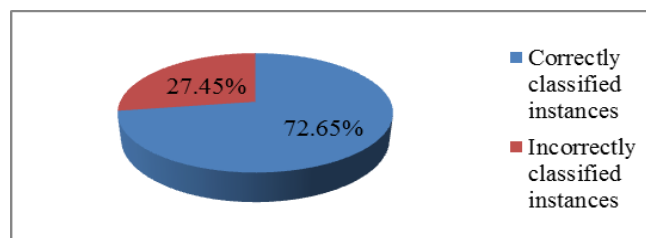


Fig.5. Accuracy chart of KNN Classifier

3) Performance Assessment of Decision tree (ID3) algorithm: After execution of system using ID3 classifier, the machine has classified 198 instances in a correct manner and 12 instances are classified in incorrect manner. Finally, the certainty of perfectly classified precedent is 96.62% and imperfectly classified precedent is 3.38%.



Table 6. Id3 Classifier

| ID3 | Prediction result | | Accuracy | |
|---|------------------------------|--------------------------------|------------------------------|--------------------------------|
| | perfect classified precedent | Imperfect classified precedent | perfect classified precedent | Imperfect classified precedent |
| Training instances: 600 Testing instances: 210 | 198 | 12 | 96.62% | 3.38% |

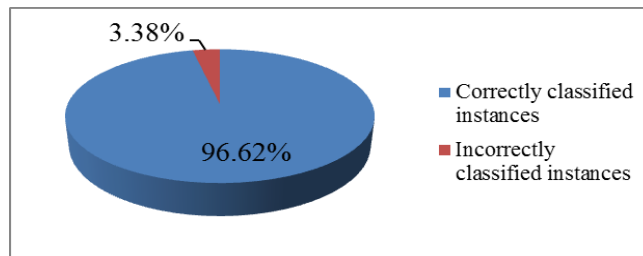


Fig.6. Accuracy chart of ID3 Classifier

4) Allegory of Classification certainty: The consummation of Machine learning system was overviewed with Lung cancer dataset using Random forest, KNN and ID3. In consonance with

demonstration results, TABLE IV denotes the consummation allegory of random forest, KNN and ID3 classifier upon its allegory split (80:20) model

Table 7. Comparison Of Random Forest, Knn And Id3.

| Classifier | No. of instances | | Accuracy |
|---------------|------------------------|-----|----------|
| Random Forest | perfectly classified | 136 | 69.43% |
| | Imperfectly classified | 74 | 30.57% |
| KNN | Perfectly classified | 162 | 72.65% |
| | Imperfectly classified | 48 | 27.45% |
| ID3 | Perfectly classified | 198 | 96.62% |
| | Imperfectly classified | 12 | 3.38% |



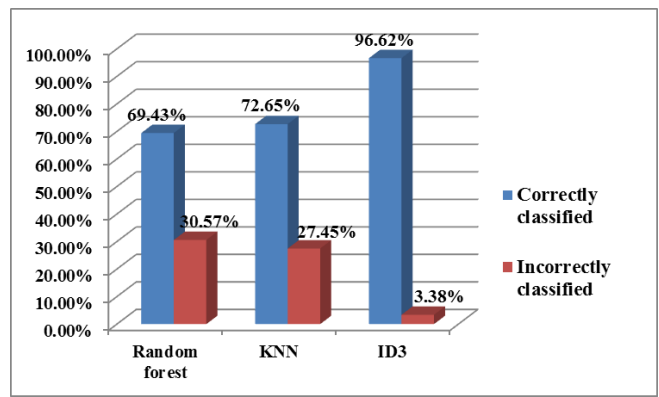


Fig.7. Graph measure Representation of consummation allegory

In Fig. 7, the graph measure representation of consummation allegory is explained from the graphical model which has been proved that ID3 algorithm performs better with higher allegory.

Conclusion

In this project, a novel system is proposed for predicting the lung cancer using big data classification technique such as Random forest, Naive Bayes search and ID3 classification. The outcome of this system is beneficial to the doctors, medical learners and also the patients to take right resolution about the diagnosis and prediction of the Lung cancer disease. Wide use of neural network as an imaging approach enables early detection of tumor formation in the lung. So, this prediction provides great convenience for eliminate only the cancer tumors with a necessary deadline promoting conservation of healthy lung parenchyma volume as possible. Finally, the project uses the K-Nearest Neighbor (KNN) and decision tree (ID3) Algorithms as supervised classification and result prediction model. And the calculation accuracy of Random forest, Naive Bayes and KNN are compared and finalized the accurate prediction.

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SENSOR BASED WATER QUALITY MONITORING AND LEAKAGE DETECTION SYSTEM

Dr. C. Aarathi., M.E.,Ph.D.,
dept.of ECE,
Sengunthar Engineering College,
(Autonomous),
Namakkal-637205, Tamil Nadu, India
caarathi.ece@scteng.co.in

M.Abirami.,
dept. of ECE,
Sengunthar Engineering College,
(Autonomous), Tiruchengode
Namakkal-637205, Tamil Nadu, India
abimadesh2000@gmail.com

J.Jeevitha.,
dept.of ECE,
Sengunthar Engineering College,
(Autonomous), Tiruchengode,
Namakkal-637205, Tamil Nadu, India
j.jeevithathanikaiavelan@gmail.com

B.Priyadharsini.,
dept.of ECE,
Sengunthar Engineering College,
(Autonomous), Tiruchengode
Namakkal-637205, Tamil Nadu, India
priyadharsinib444@gmail.com

Abstract—Water is crucial to human life, pollution has been an increasing problem over the previous couple of years. it is a most precious not only for the civilization but also for all the living things in the planet. It serves us in 360 degrees starting from households to hydroelectric plants of our life so on. So it's very important and responsibility of everyone to manage the water in an efficient way. In this paper we propose an efficient water monitoring system based on the internet of Things. If we keep wasting water continuously it may be very dangerous problem in future. We must always start saving water from ourselves. There are various ways through which water get wasted. Leakage plays an important role in water wastage. Whenever there's leakage somewhere we couldn't catch on in initial stage but when it becomes a huge problem it causes large wastage of water. So it's better to take action immediately as soon as leakage takes place. so as to convey a solution, we proposes a system that monitors the water level, water quality and water leakage using various sensors in real time. Leakage respectively. Once the flaw is identified, it's informed to control room through the internet (Email, twitter, SMS) and also nearby people can be informed in time. By placing this method, we will be able to collect and analyze the water usage patterns of the residents and save plenty of water

in small still large scale in future.

Keywords- Water Quality, arduino, IoT, GSM Module, pH sensor, Ultrasonic sensor

I. INTRODUCTION

Water is a universal solvent which plays an important part in everyday life. The water available on earth has been estimated at 1.4 billion cubic kilometres, enough to cover the earth with a grade of about 3 km. About 95 of the Earths water is unfit for mortal consumption. About 4 is locked in the polar ice caps, and the rest 1 constitutes all fresh water begin in rivers, aqueducts and lakes which is suitable for our consumption. A study estimated that a person in India consumes an Normal of 135 litres per day. This consumption would rise by 40 by the time 2025. This signifies the need to save our fresh water coffers. The supplementary water tank was made to store water that's collected from rain water by numerous houses. Clean drinking water is a significant resource which is needed to sustain life and plays a major part in the well- being of the human beings. In the real time process, drinking water serviceability and water supply to the consumer end gates at urban area face new challenges to guard water inventories from deliberate or unintentional impurity. Contaminated drinking water serves as a transmission medium for several dangerous agents which produce adverse goods in humans and cause serious health issues. Thus, there's a need for better real time in- pipe water quality monitoring system to be stationed in the water

distribution network and at consumer sites. At present, water meters are used to calculate the quantity of water used at homes. This doesn't give an effective system of covering the water Operation. The water is wasted at each and every outlet deliberately or intentionally which adds up to huge quantity in the end. Effective operation of the water used at homes is veritably important necessary as, about 50 percentage of water supplied to the metropolis gets wasted through its incorrect operation. With growing industry advancement and world population industry advancement, environmental pollution came big concern. Systems for air and water quality monitoring are needed for exercise analysis and their impact on nature of the power plants, mining sector, canvas and gas etc. Principally, determination of water quality relies on estimation of values of some important and reflective parameters. For illustration, the water quality monitoring demands the determination of parameters like PH, dissolved oxygen, content of ammonia, conductivity, turbidity, temperature, dissolved metal ions, etc. Although there are well known and extensively used styles for dimension of these parameters with applicable Detectors, design of electronic systems for environmental monitoring isn't frequently straightforward. The engineering challenges are colourful detector bumps are generally stationed in remote places, long-term deployments require detector nodes to be robust and systems to be fluently reconfigurable, detector bumps have to be suitable to operate autonomously in the required terrain, etc. Also, similar operations bear largely dependable and accurate detectors with the reduced position of conservation, long continuance, fast response times, high perceptivity and high selectivity. With the preface of IoT in the ultramodern world, numerous problem have been answered. With the use of IoT in covering water and air quality, colourful issues similar as data collection, communication, data analysis and early warnings are worked on. Water management is only possible, if the user is sensible of the volume of water he uses and the quantity available to him. For every lives water is essential. Hardly anyone keeps in track of the level of water in the outflow tanks. Accordingly, automatic controlling involves designing a control system to serve with minimum or no human hindrance. The idea can be implicitly used to ascertain and control the level of water in overhead tanks and help the loss. In this Arduino based automatic water level indicator and regulator design, the water level is being measured by using ultrasonic detectors. The ideal of the design is to measure the position of water in the tank and notify the stoner about the water position. In this paper next we are explained about existing method, proposed method and finally the result and conclusion

II. LITERATURE SURVEY

[1]. This paper dictates what can be done to resolve those issues by involving the Internet of effects (IoT) and the damages caused by water. Keeping the quality of water in check is today's ultimate aim. Thereby, to guarantee safe drinking water supply, the quality of water should be observed regularly. The use of IoT based result, concentrated substantially on water quality monitoring has thus been suggested. In order to support the issue, an IoT- based water quality checking network has been introduced that continuously experimenters and evaluates the quality of water and tries to distinguish whether it's over to the mark for general use. This paper includes the use of specific detectors that calculates the various parameters of the quality of water which includes conductivity and dissolved oxygen (DO), turbidity, pH, and temperature. The values from the detectors have been measured and calculated using the microcontrollers. Also these Reused remote values have been transmitted to the raspberry pi, the central regulator which uses the ZigBee protocol. finally, all the data from the detectors are also accessible via cloud computing through any browser, on request

[2].Most of the people in domestic areas face the problem of running out of water and overflow of water in water tanks due to redundant force of water. It becomes delicate for users to judge the position of water in water tanks. When the pump is turned ON, users won't realize that the water tank is filled, which may affect in overflow. Water position index and regulator system is used to sort out the issues associated with water tank. It's also possible to check the position of the water using detector so that whenever the water goes below, pump gets turned ON automatically. Also when there's overflow of water in water tank it uses detector to detect the water position so that if the water position goes over, the pump gets turned off automatically. This system prevents destruction of water

[3]. Online Checking System for Drinking Quality of drink slot machine aimed to 1) Study and design checking system for drinking quality of drinking water dealing machine and 2) Develop drinking water dealing machines to own the quality and safety in drinking. The system will be checking with 5 parameters similar as Turbidity, Conductivity, Total Dissolved Solids (TDS), pH and temperature of the water. The system was designed within the robotization system by a regulator included GSM module 3G Shields (UC20-G) in transferring data for creating a database in Real- time. The system is noticed about water quality in real- time on the mobile, website, station on Google chart and Time of conservation in changing the water sludge. This exploration, showed that the system can inform the water quality information at the stations with installation of the drinkable machine and it can send

alerting Communication to transportable and website in real-time to the responsible persons or affiliated person, the detectors utilized in this exploration are effective in work and have the accurate in dimension of potable quality.

[4]. Water is essential to human life. It's most precious not only for the human race but also for all the living effects in the earth. It serves us in 360 degrees starting from homes to hydroelectric shops of our life and so on. So it's actually important and responsibility of everyone to manage the water in an effective way. In this paper we propose an effective water monitoring system grounded on the Internet of Effects. If we keep wasting water continuously it can be actually dangerous problem in future. We should start saving water from ourselves. There are colorful ways through which water get wasted. Leakage plays a vital part in water destruction. Whenever there's leakage nearly we couldn't get it in original stage but when it becomes a huge problem it causes large destruction of water. So it's better to take action incontinently as soon as leakage takes place. In order to give a result, we put forward a system that monitors the water position, water quality and water leakage using colorful detectors. The ultrasonic detector and flow detector senses the water position and the water leakage independently. Once the excrescence is linked, it's informed to control room through the internet (Dispatch, twitter, SMS) and also near people can be informed in time. By placing this system, we will be suitable to collect and analyze the water operation patterns of the resides and save a lot of water in small as well large scale in future. As per our reference there are no projects with combination of water quality and water leakage finding, As technical side. For water leakage no sensors are used to find the leakage it has been identified by manual for water quality checking also GE filtration method is used so for which implemented in RO system Maintenance cost and manual interpret in required

III. METHODS

A model of the water distribution networks using wireless sensor networks is depicted as in the Fig.1. At each point of water supply in the distribution pipeline to the household, the sensor nodes in the water distribution network will be placed to active mode for sensing. The sensing unit efficiently transmits real time data to the central processing unit for further analysis regarding water quality. All the sensed water quality parameter data are analyzed using fuzzy logic and are transmitted wirelessly to the notification unit in the administrator's office. The algorithm for detecting the contamination and decision making are performed in the

processing unit. Finally, the notification node receives information about the contamination occurrence and alerts the consumers. The designed water quality monitoring system is promising as it detects contamination even at low concentrations.



Fig1. Water Distribution Networks Using Wireless Sensor networks

IV. SYSTEM ARCHITECTURE

The control system is designed in such a way that it automatically monitors and control's the water levels, water quality and leakage detection in tanks, dams, pipe, home etc. We are using the Arduino Uno to control the management and leakage detection in any type of objectives The measured sensor details will be send to control room and are display on mobile app, laptop. The condition about this system is updated to the web server using IOT through Blinkapp.

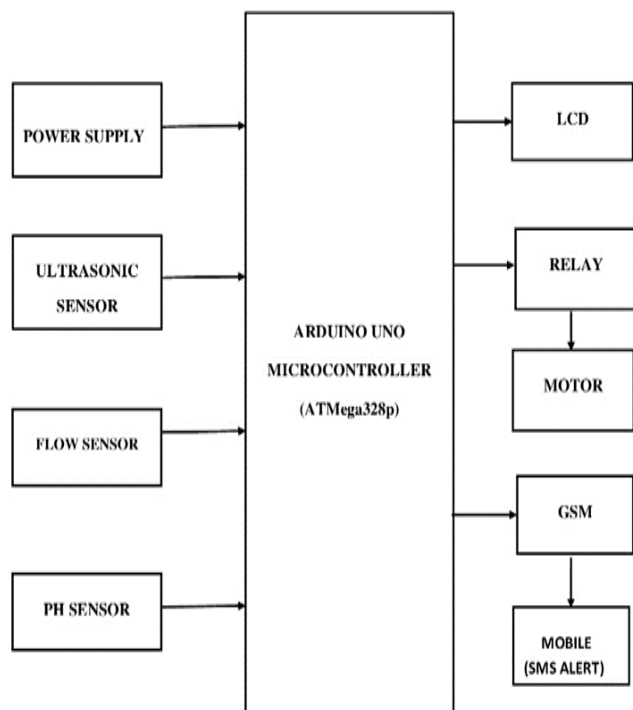


Fig.2 The block diagram of water quality monitoring and leakage system

A. Arduino Uno

In this system we are using Arduino UNO has the micro-controller .it is the most a part of the system. It's 14 digital I/O pins out of which 6 provide PWR output. it's an open-source and provides prototype platform. It also contains a 16MHX quartz oscillator attached thereto. additionally to the above features, it also has an USB connection, an influence jack, anS ICSP, header and button. It's everything to support a micro-controller. It can simply be connected to a computer using an USB cable or power it with an AC or a DC adapter or electric battery.

B.pHsensor

A pH detector is one of the most essential tools that's generally used for water measures. This type of detector is suitable to measure the quantum of alkalinity and acidity in water and other results. When used rightly, pH detectors are

suitable to insure the safety and quality of a product and the processes that do within a wastewater or manufacturing factory. In utmost cases, the standard pH scale is represented by a value that can range from 0-14. When a pH value of seven, this is considered to be neutral. Substances with a pH value above seven represent advanced quantities of alkalinity whereas substances with a pH value that's lower than seven are believed to be more acidic. The difference between an alkaline substance and an acidic substance is veritably important. The human body has a standard pH position of 7.4, which is essential for the body to run effectively. However, it'll look to return to the neutral state, if the composition of the body every becomes too acidic or overmuch alkaline. In this product we this pH detector to detect the pH value of water.



Fig 2.pHsensor

C.Ultrasonic sensor

It is basically a distance sensor and is employed for detecting the distance. it's two ultrasonic transmitters namely the receiver and also the feedback circuit. The transmitter emits a high frequency ultrasonic undulation which bounces far from any solid object and receiver receives it as an echo. The echo is then processed by the feedback circuit to calculate the time and also the difference between the transmitter and receiver signal. This time can subsequently be used to measure the measure the distance between the sensor and also the reflecting object. it's an ultrasonic frequency of 40 KHz and accuracy is nearest to 0.3m.

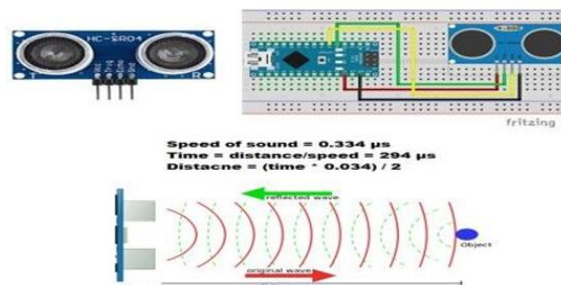


Fig 3.Ultrasonic sensor

D. Flow sensor

Flow sensor to detect leakage in a pipe is used for flow measurement. Precise measurement of the flow is an important step in qualitative and economic terms. The panel sits next to the

water line and includes a panel to calculate the volume of water that has passed through. An integrated Hall-Effect magnet sensor generates an electric pulse with every turn.

quality testing is likely to be more economical, convenient and fast. As each and every variation of water level is informed to the cloud through the internet and nearby people can be informed in time. Thus saving lots of lives avoiding unpleasant scenarios



Fig 4.Flow Sensor

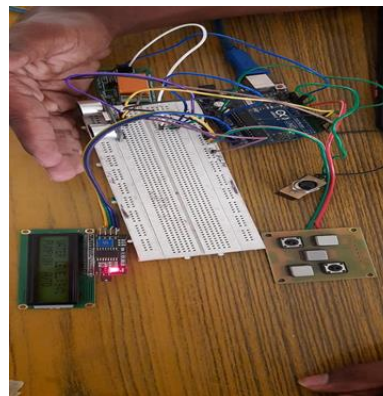
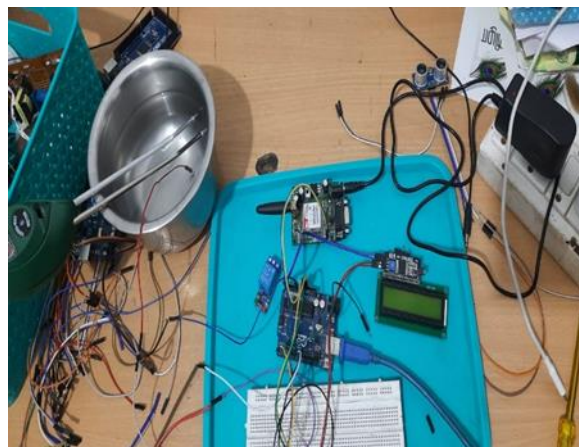
E. GSM

A GSM modem may also be a normal GSM cell phone for connecting to serial port / USB port on your device using the appropriate cable and software driver. All phones supporting the 'Extended AT command range' are used to send / receive SMS messages

F. IMPLEMENTATION AND RESULT

The system can monitor water quality automatically, and it is low in cost and does not require people on duty. This system is used to avoid the huge amount of water is being wasted by uncontrolled use of home/offices etc. The water

WORKING MODEL



V. CONCLUSION

In this proposed work, the look and deployment of the important time water quality monitoring system for drinkable using wireless sensor network has been presented. The developed system has been field tested at school hostel region, for monitoring of water quality parameters. it's an occasional cost, lightweight system and has low power consumption. Moreover, the system is in a position to log bulk data and transfer to remote locations. The contamination detection algorithm and also the fuzzy rules help to spot the contamination within the pipeline and classify water supported the contamination. This deployment provides rich data to the water consumers/public, authorities in municipal office. The sms alert and mobile app ensures the security of beverage. Our future plan is to analyze the performance of designed system against other sorts of contaminants like nitrates, lead etc.

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CERTAIN INVESTIGATION OF MONITORING SYSTEM IN TRANSPORTS USING IOT

Dr.P.Ramesh kumar¹, Brindha G²,Priyadharshini K³,Yuvarani M⁴

1(ECE, Sengunthar Engineering College(Autonomous), Tiruchengode
Email: dean.research@scteng.co.in)

2 (ECE, Sengunthar Engineering College(Autonomous), Tiruchengode
Email: brindha2001g@gmail.com)

3 (ECE, Sengunthar Engineering College(Autonomous), Tiruchengode
Email: kumarpriya172001@gmail.com)

4 (ECE, Sengunthar Engineering College(Autonomous), Tiruchengode
Email: yuvaranim0@gmail.com)

Abstract:

Innovations and technology will make our life became much easier now a days. We are working on developing a college bus monitoring system using RFID (Radio Frequency Identification technology). Our project is about controller and RFID based displaying and updating bus management system based on IoT and embedded system, to achieve automatically display and manage the bus database details with bus name or number, entry and exit time of the specific vehicle alongside date without the need for manual operation. It is part of intelligent transportation, at the same time the use of auto data base management, to reduce the work load of the bus management system, microcontroller was used to receive and send the data, then the data is communicated to the IoT module. For every vehicle RFID tag will be given. In gate the RFID readers are located. Using reader tag, information is retrieved. The serial number of each tag is associated with each transport's database. With the help of the system RFID and the Internet of Things, the transports monitoring will be easy to access; through the accuracy and reliability of the data, the system gives accurate information to the administrator of transports. The proposed system can inform in charge of transports whether the bus is arriving on time, early or late.

Keywords — RFID Technology, IoT, Transport Monitoring.

I INTRODUCTION

Nowadays, travel time information of transports becomes a major component of Advanced Traveler Information System (ATIS). These travel time of transports depending on external parameters such as accidents, stuck in traffic. Most bus station follows fixed schedules, and don't use intelligent systems for vehicle tracking and control. Many supervisors are deployed at the station to control the entrance and the exit of buses and prepare the trip sheets containing the schedules manually which is time consuming and inaccurate. Manual control can be used in offices, laboratories and libraries where it is essential to keep a record of the people entering and exiting. At present every work should be done manually and because of this performance is degraded. This problem can be solved by using latest technologies like Radio Frequency Identification (RFID). RFID is the wireless non-contact frequency electromagnetic fields to transfer data, for the purposes of

automatically identifying and tracking tags attached to objects. In this system the individual RFID tags and readers are viably utilized for observing transports. There is a feature provided in this system to generate daily reports monitoring of transports can be done automatically. In addition, Arduino UNO and Esp8266 (NODEMCU) are utilized in this task. These both communicate with one another and the information's are spread through WIFI - Device NODEMCU to the cloud. Whenever transport entered into the organization the RFID reader peruses the transport number, transport entry timing will be captured. With the assistance of Esp8266 (NODEMCU) all the subtleties are sent to the college transport office through the cloud with the assistance of Esp8266. These subtleties if not matches with the predefined boarded database of the bus, then use MQTT (Message Queuing Telemetry Transport) server module will send the message to the person who is in charge of transportation system of college. Then the monitoring of transport reports can be done easily to the administrator without human force.

II LITERATURE SURVEY

Radio Frequency Identification (RFID) is introducing, and it's bringing a streamlined revolution in this world. When dealing with the tracking device, Radio Frequency Identification (RFID) is the latest phase in the decades that can be used as an efficient tracker. Radio Frequency Identification (RFID) Technology used to develop tracking system is quite new but something that promising. This is used to gives solution RFID technique for monitoring entry and exit of employees with their official assets (E.g., laptops). This system is actually based on external database system that will provide the pre-recorded information about the reader. Since the reader detected by the database, then the tracking system will process the data and will show the result of subject tracking. [1]

In the era of embedded systems efficiency and time are the matter of priority. RFID (Radio Frequency Identification) one of the converging technologies and transportation plays an important role in urbanization, RFID is one of the key catalysts playing a significant role in it. RFID plays major role in auto ID applications like RFID contact fewer smart cards used by bus riders, in Super market, Textiles and logistics chain management. This is mainly focused to understand the benefits of RFID technology and possibilities to reduce the accidents on Indian roads. The GSM (Global System for Mobile Communications) has been a great success to providing both voice and low speed data services. In GSM one of the major evolutionary steps to serve real-time high-speed data services is to Enhanced Circuit Switched Data (ECSD). [2]

The basic concept of connectivity is IoT can be integrated into traditional communication network to reduce many problems. Vehicle-to-Infrastructure (V2I) technology is one of the aspect of IoT enabling intelligent transport systems. In V2I Vehicular monitoring is part which to helps minimize the problem caused by vehicles in the city, like traffic violation and road accidents, congestion. In this system observed an instance of Vehicle-to-infrastructure communication model realizing data transmission between traffic light and vehicle is to be regulated. A On-Board Units (OBU) prototype and Road Side Units (RSU) prototypes are developed. Vehicles send Identity, speed and location messages to the traffic controller fully based on Zigbee wireless technology. The message is analyzed to check speed violation. From the RSU information related to user's driving is transmitted to a monitoring server to charge the offender of traffic rules.

Therefore, the modules based on Controller Area Network (CAN) bus for in- vehicle communication, OBU details for Over speeding in highways, RSU information for Real time data collection and E-mail notification service based on violation rules are developed [3]

The lifecycle for industrial applications is becoming shorter, the application complexity increases, performance is too low, fault tolerance is required, reuse of components is desired, and the developer require strong verification tools to cut down the verification phase. These problems are increases with based on longer development time and requirements of higher quality from the customer, its more important to examine flexible and scalable parallel processing for complex real-time systems. This is the motivation forerunning the research project SARA (Scalable Architecture for Real-Time Applications). The first SARA system is now running with vision system connected to an industrial robot (ABB Robot). The system-busses are important resources in computer-system. Today there are no methods to monitor busload during runtime; in this project discuss a simple method of how to do this.[4]

In this work present to integrate RFID (Radio Frequency Identification) in WSN (Wireless sensor network). It is used to support Radio Frequency identification process by the read range of an RFID system extended. Besides, we can monitor the environment of an object and optimize RFID reader's performance and energy by the use of wireless sensor networks. Then the methodology to integrate RFID technology, WSN forms an intelligent bus tracking application is studied. The proposed system can monitoring bus traffic inside spacious bus stations and used to inform the administrators to whether the bus is arriving on time, early or late. This information is then displayed on the different wireless displays inside and outside the bus station. [5]

III EXISTING SYSTEM

In existing method, have to monitor the transports related data by the use of manual system to get a information in institution. No automatic system was implemented to get information automatically which will lead work load and manual errors may occur in that system.it is a long process to monitoring and maintaining the database by the use ledger, it may give error to database of the transports. There is no storing method to handle the real time daily databases in previous method. Overcoming this method, we can choose RFID methodologies to store and give the daily databases of the transports in all organizations.

IV PROPOSED SYSTEM

BLOCK DIAGRAM

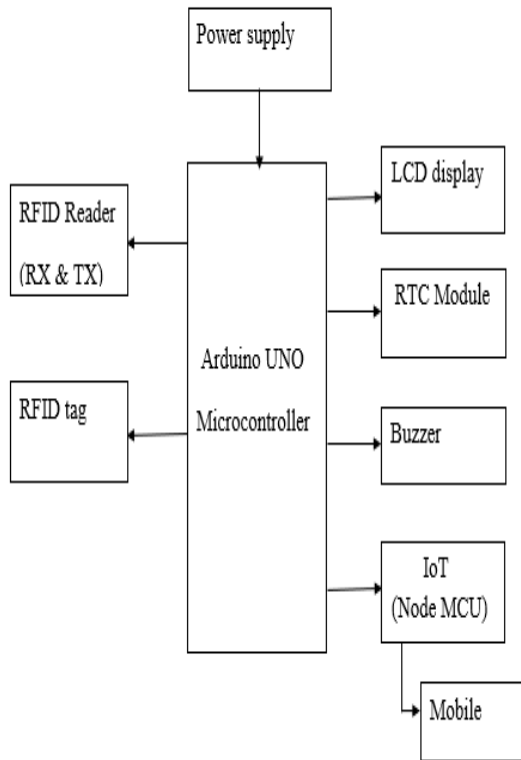


Fig.1 Block Diagram for RFID Based Transport Monitoring System

This project proposes a system for tracking college bus using advance techniques which are capable to deliver results and the information in a rapid and efficient way. In this system will propose the bus database monitoring on Android Application which is used MQTT server. It will modifies the advance and latest techniques for the existing System. The system will replace IOT, the traditional way of monitoring the bus by using IOT system. The data will give the exact timing of bus in and out and co-ordinates of the Bus. The RFID will be connected to the microcontroller. The Arduino Uno has web connectivity using IOT module. The RFID is placed in a bus. The software will also stores the daily information monitoring of Bus like, details of Bus, identity number, etc. In and out gate time which will be shown on an LCD display and as well as stored in software if it is exceeded in the predefined time of institution then the message will automatically send to the administrator who is in charge of the transportation.

This proposed method mainly focused on the RFID technology which will overcoming the existing method of monitoring the database these technologies will give better solution to monitoring the database automatically.

Radio-frequency identification (RFID) - It is a programmed identification technique; this will be depending on Storing the data and recovering information remotely by using RFID labels or transponders.

RFID Reader: It will send the electromagnetic waves which

is carrying a signal to identify objects. This will ensure that finally the reader receives the information returned back by these kinds of objects.

RFID tag: Unique identity tag will attach to the objects; it will react to receiving the signal from a RFID reader and sent the required database in order to forwarding to it the requested information.

Computer/database: It will be used to storing and processing the information collected by the RFID reader.

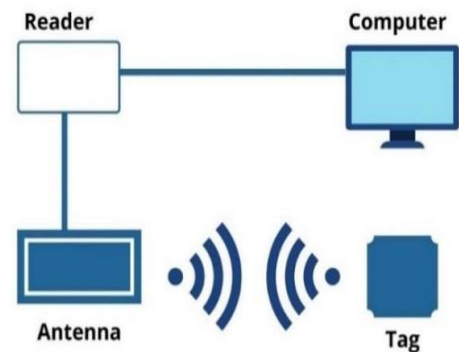


Fig.2 RFID Technology

A. ARDUINO UNO MICROCONTROLLER

In this system using Arduino uno controller. It is a main part of this system because it internally stores the all-transport related database programmed inside it by the use of embedded programming. It is used to get information from the RFID reader and send it to the WIFI gadget (Node mcu). LCD is likewise associated with it so as to see the passage entry and leave time status, bus number along with date.

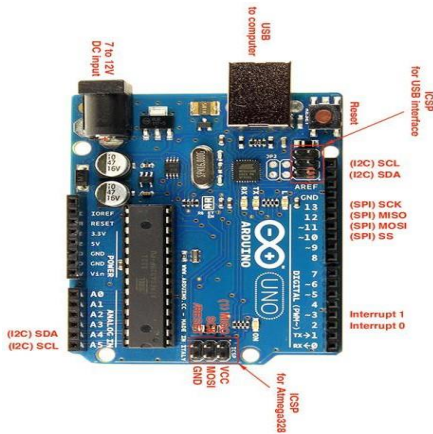


Fig.3 Arduino UNO

B. RTC MODULE

RTC means Real Time Clock. RTC modules are simply TIME and DATE remembering systems which contains battery setup in the absence of external power keeps the module running. In this system Entry and exit time of the buses are generated by using RTC and the Arrival time is noted and displayed in LCD.

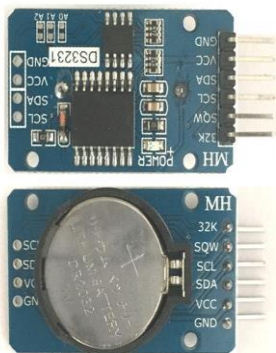


Fig.4 RTC Module



Fig.5 NODE MCU (ESP2866)

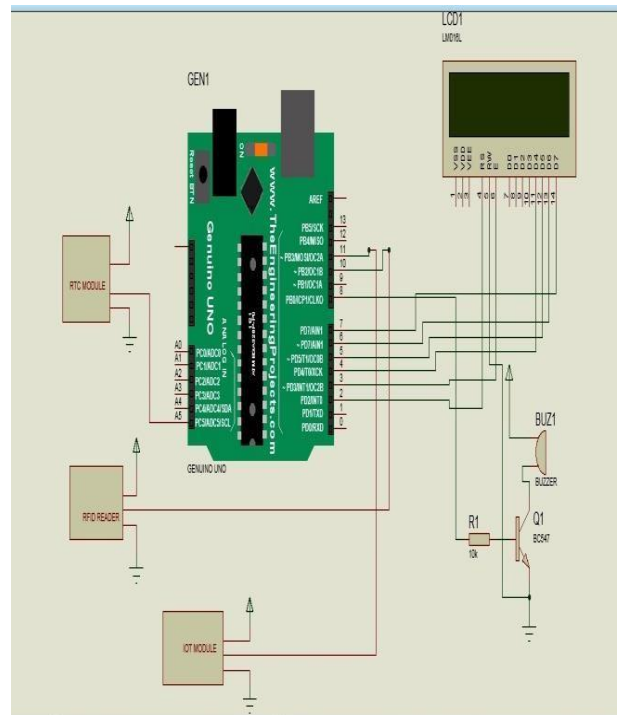


Fig 6. Circuit diagram for Transport Monitoring using IoT

C. NODE MCU

Node Microcontroller Unit is simply called as NODE MCU it is a open-source software and hardware development environment built around an inexpensive System-on-a-Chip (SoC) called the ESP8266. WIFI gadget utilized for sending the subtleties caught to the cloud (MQTT client).It cooperates with Arduino Uno and gets the subtleties from it and sends to cloud. Node red represents the buses updated on entry in real time database cloud with the help of NODEMCU. If the predefined database will not match the subtleties then the SMS notification and buzzer indication send through it.

V WORKING PRINCIPLE

There are two sections in this project one is transmitter section which contains a RFID tag and it is placed on the bus and another section is receiver section which contains a RFID reader placed on college gate. Bus is consistently monitoring by the use of RFID Technologies. The Reader continuously producing a radio waves. These waves are used to passively identified tagged object by the use of passive RFID tags. The Radio frequency ranges are different in frequencies. These frequency ranges mostly give the RF ranges of the tags from low frequency tag ranges

from 3m to 5m, middle frequency tag ranges from 5m to 17m and high frequency tag ranges from 5ft to 90ft. When bus comes in the range of the college gate, with the help of wireless networks. This can constantly maintain the bus data base with the help of controller. Finally the database will store inside the software called node red and the data will be monitored by the authority of transport remotely.

punctual to the transport schedules that have been established, resulting in a more efficient transport circulation system in the institution. Generating reports with the help of internet browsers is convenient and flexible for printing the History of SMS and Time-in-time-out. In future expect that the system will inspire the designers and developers to develop transport monitoring with enhancement of features in future.

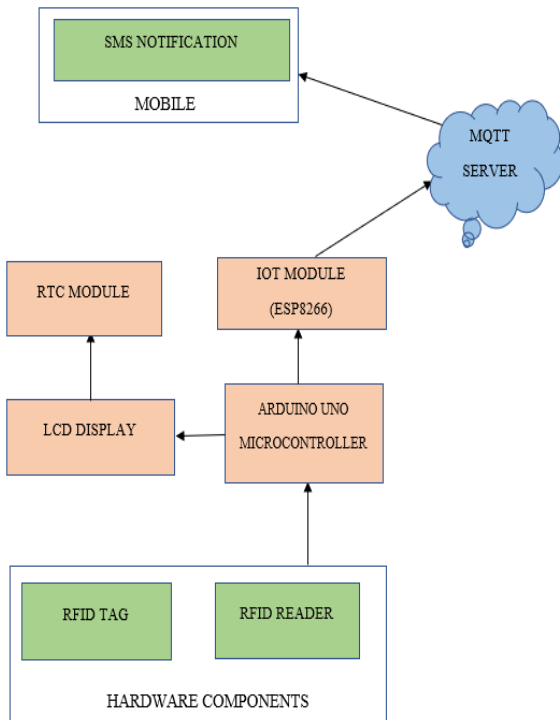
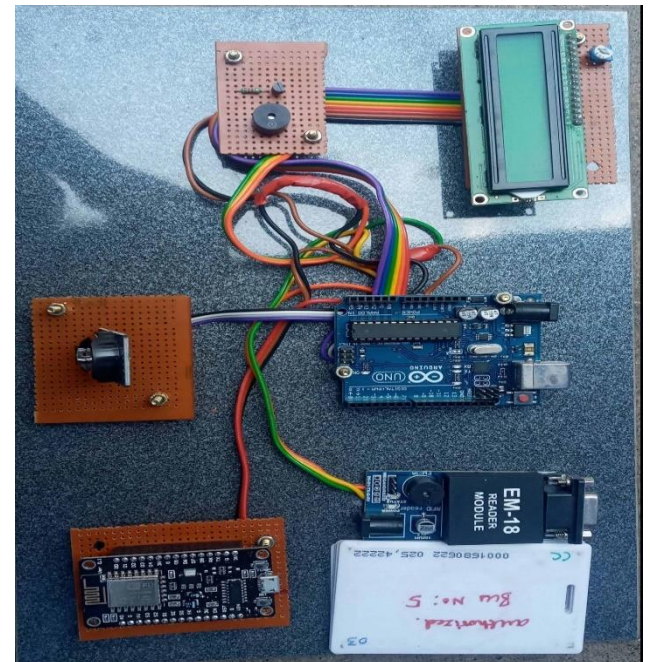


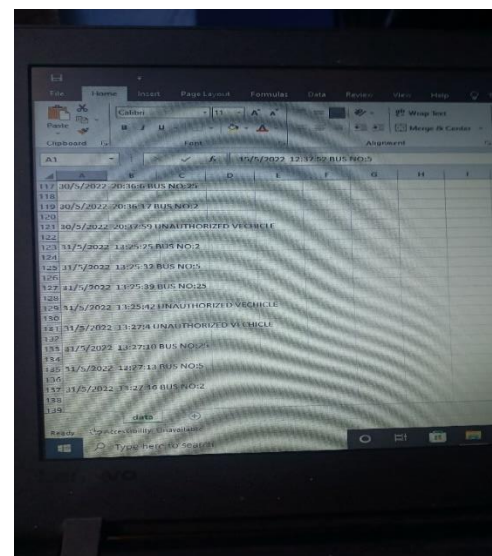
Fig.7 Architecture diagram

VI RESULTS AND CONCLUSION

As the RFID technology evolves, various sophisticated applications will use the capability of RFID to send, receive, store and forward the data to a remotely to the sink source. Each area needs to be exclusively programmed. Maintenance is bit costly than traditional system. As the tag is read by the reader it will give relevant information to the system. The reader will accept the card if the tag information is already stored in the database. This framework can be stretched out for full-time monitoring and college transports that will be useful for Transport organization at least expense. This system gives time saving, easy control and reliability and also reduces manpower. Bus drivers will ensure to be more



VII SYSTEM OUTCOMES



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INNOVATING FIRE DETECTION UTILIZING RASPBERRY PI FOR SMART CITIES

1st Rahul. A., M.E

Assistant Professor, Department of ECE,
Sengunthar Engineering College,
Tiruchengode, Tamil Nadu, INDIA
arahul.ece@scteng.co.in

2nd Gomathi.L

Department of ECE,
Sengunthar Engineering College,
Tiruchengode, Tamil Nadu, INDIA
lgomathi2000@gmail.com

3rd Lipi Suksha.M

Department of ECE,
Sengunthar Engineering College,
Tiruchengode, Tamil Nadu, INDIA
lipisuksha@gmail.com

4th Sowmiya.S

Department of ECE,
Sengunthar Engineering College,
Tiruchengode, Tamil Nadu, INDIA
sowmiyashanmugam2001@gmail.com

Abstract— Smart observation devices contain sensing module and communication module frameworks and square measure developed to sense the information from the atmosphere and store the leads to the net servers. They are aimed to reply within the initial stage of essential situations for notifying the users. Fire place safety could be an essential application for home safety to avoid wasting people's lives. Fire place detectors will alarm in initial section supported characteristics like combustion, flame, smoke or gas. Our aim is to inform the users on the detection of flame with the assistance of a flame device in order that the person will take action consequently. With the assistance of web of Things (IoT) paradigm, the fireplace detection system is developed mistreatment Raspberry-Pi that produces use of flame device and Google cloud-based electronic communication service (GCM) for causation an alert message to the users. Thus, the result of this device helps individuals in taking necessary precautions within the home welfare.

Index Terms— Raspberry Pi, MQ6 Semiconductor Sensor, Wi-Fi Module, Buzzer, Flame Sensor, Water Level Indicator, Web camera, Relay, Exhaust fan, Sprinkler System.

I. INTRODUCTION

In today's era, securing resources and loss of lives against hearth is changing into a lot of crucial. Observance residential and industrial areas are an economical technique to decrease personal and property losses because of hearth catastrophes. The planned system is wide deployed in those sites. The planned system provides numerous options on period observation, checking automatic alarm. The most features is to produce hearth protection to observe an rising hearth crisis in a very well-timed manner, and to alert the house occupants for hearth disaster organizations. The standard system doesn't

guarantee 24/7 checking from hearth security. Moreover, the present hearth protection system might unfold anxiety within the entire house or building because it doesn't reveal the situation of fireside. It solely raises alarm whenever a hearth is detected at anywhere. Afraid individuals might begin to run away chaotically. As a result buildings packed with labours within the factories, individuals may be blasted by the outgoing force of the afraid crowd and hurt viciously. On the opposite hand, from time to time individuals don't grasp the strength of the hearth and not ready to evacuate fire-affected building apace. It may lead to a shattering result and also the planned system will scale back these accidents. to stop the hearth from increasing: some onerous works are hugely necessary like breaking electrical circuits of the affected arena, releases hearth conclusion gas within the accident spot, informing hearth facility, informing building observance committee by text messages. In general, hearth detectors are aimed to retort it at initial stage to one or a lot of the main characteristics of combustion, heat, smoke, flame or gas. There are not any single detectors for every kind of fireside locations. Temperature detectors react on temperature increase by hearth and smoke detector reacts to gas or smoke occurred because of hearth. Thus, the planned system discusses automatic hearth detection system victimization Raspberry Pi and sensors

A. Fire Accident

An accidental hearth could be a mishap that might be either synthetic or natural. Accidental hearth happens oftentimes might be controlled however may every now and then lead to severe loss of life and property. Like several alternative country, Bharat additionally incorporates a history of fireplace incidents. Most of the deaths ensuing from injuries square

measure caused by hearth accidents. Thus, accidental fires square measure one in all the leading causes of unintentional deaths. The most reason behind death in hearth incidents is burning; however inhalation of smoke and toxic gas causes death further. Hearth is that the results of applying enough heat to a fuel supply, once you've a full ton of O₂ around. Because the atoms within the fuel heat O₂ up, they start to vibrate till they break away of the bonds holding them along and square measure discharged as volatile gases. These gases react with O₂ within the encompassing atmosphere.

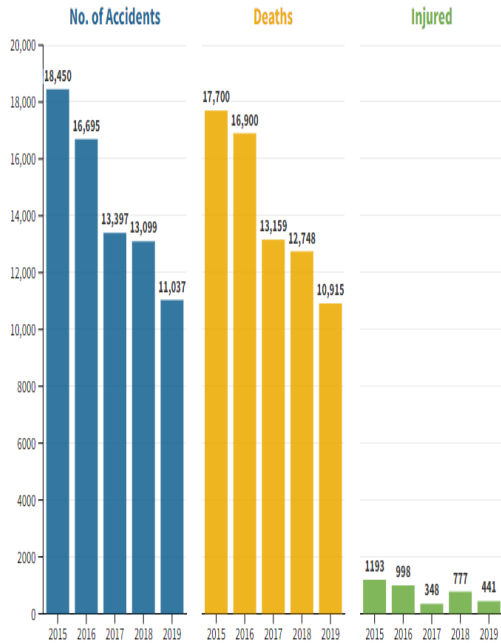


Fig 1: Statical data of fire accidents

II. LITERATURE REVIEW

The authors in planned fire place the fire hearth warning device that detects the presence of smoke within the air because of fire as partner in nursing embedded device they need used raspberry pi and arduino proper here the machine will ship accomplice in nursing alert message once the hearth is detected and in to order to prevent from fake conscious of hearth-fighter the system accustomed take confirmation from the user to ship a brief message carrier SMS here the system uses the fuel tool for sensing difficulty of the tool might now not ring so the user in each other place or a ways from the affected region the close neighbor can get to grasp concerning the hearth and can take immediately motion md iftekharul mobin et al has created the realistic system that senses via truly distinctive assembled sensors and actuators and mixed by way of the usage of formal common sense to perceive the hearth affected space locations and severity the machine notifies the hearth service via textual content message and calls the hearth alarm jewelry in the case as quickly as a hearth is detected and at the facet of the ringing it offers information of place of the hearth-affected area through the use of announcement moreover it prevents fire from spreading through breaking the electric circuits of the affected vicinity to enforce the whole scenario they need used

the three sensors

1. Flame Device,
2. Gas Tool,
3. Temperature Tool

downside of deliberate paintings is they need now not taken into perception the fake alert facility the authors in planned a device consists of with it numerous devices going for walks along for detection and to warn people it detects smoke carbon monoxide fuel and fire via visible and audio devices they used flame device as hearth detector on the aspect of Google cloud digital electronic communication GCM for alert messaging to the client they used a digital camera for early detection of hearth by using the use of rotating the digital camera altogether direction difficulty of this approach is that it would not ring so the person in another space or a long way from the affected vicinity a nearby neighbour can get to understand concerning the hearth and can take immediately motion similarly as a fake facility is moreover no longer concept of Dhruvajyoti Paul et al planned style of smooth hardware circuit that permits every consumer to use fireplace device temperature tool gas tool and smoke device to mix into any planned device to set off at ease low fee and low power intake this method are applied in domestic protection in addition as in industries GSM based completely essentially networking is indulged to beautify the operating of the machine trouble of the deliberate art work is they need now not concept of the affected area place simply in case if digital camera captured photo is distributed to person on the aspect of message the purchaser can make certain whether or not or now not or now not there's a hearth or not inside the authors deliberate a GSM-based fire detector gadget that successfully detects hearth or smoke associate in nursing sends an alert message to the consumer with the aid of the use of keeping off a high-priced home and commercial enterprise breakdown they used hearth detector smoke detector to enjoy a fire really in case of companion emergency as a smoke detector they used slight-hooked up electric device LDR and as a fireplace detector they used a thermal resistor to study the gap temperature in the case as soon as because of hearth the gap temperature can boom impediment of this prose artwork is they want now not idea of the affected place region in reality in case if virtual digital camera captured photo is sent to purchaser on the side of message the person can make certain whether or not or not there can be a hearth or not.

III. PROPOSED SYSTEM

In this project the MQ6 semiconductor sensing element and flame sensing element at the same time collect the information from the house then transfer it to the raspberry pi. The Raspberry pi board, then checks the values submitted by sensors. Once there's presence of a flame the system can pour water on the precise place, just in case the run of gas is detected, the fan can mechanically exhibits the smoke. The water level sensing element can sight the amount of the water in tank that helps for the system to figure. The online camera can realize the fireplace round the building. The intimation messages are passes to user through WI-FI module and additionally the buzzer beeps and also the alert goes to the recruitment team.

IV .BLOCK DIAGRAM

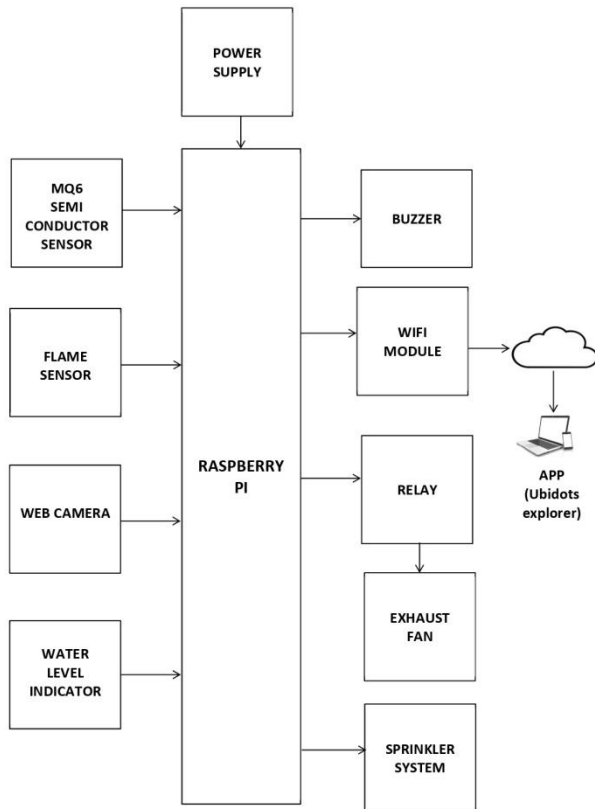


FIG 2

V.HARDWARE DESCRIPTION

A. RASPBERRY PI

The Raspberry Pi Zero W has been designed to be as versatile associate degree compact as doable with mini connectors and an uninhabited 40-pin GPIO, permitting you to use solely what your project needs. At the center of the Raspberry Pi Zero W may be a 1GHz BCM2835 single-core processor with 512MB RAM. Quite honestly, this Pi is concerning fourfold quicker than the initial Raspberry Pi and is just a fraction of the price of this RPi3. The setup for the Raspberry Pi Zero W may be a very little additional sophisticated than on different Pis. Attributable to the tiny size, several of the connectors on the Raspberry Pi Zero aren't customary. For starters you may desire a mini HDMI to HDMI cable or adapter to attach to your monitor. You may conjointly want a USB OTG cable to attach a USB device, furthermore as a novel CSI camera cable. Regardless of however you wish to use your Raspberry Pi Zero W, you may want a micro SD card with associate degree software and a high-quality 5V power offer to power your board. In the raspberry pi three version b is that the ultra-contemporary product within the raspberry pi three vary boast a sixty four-bit quad core processor walking at one 4ghz twin-band a handful of 4ghz and 5ghz wireless network Bluetooth

four ready quicker local area network and creator capability via a separate author that the twin-band wireless laptop computer community comes with most well-liked compliance certification allowing the board to be designed into stop product with considerably reduced wireless laptop computer community compliance finding out up each fee and time to push the raspberry pi 3 version b keeps a comparable mechanical footprint as each the raspberry pi a handful of version b and consequently the raspberry pi 3 model b.

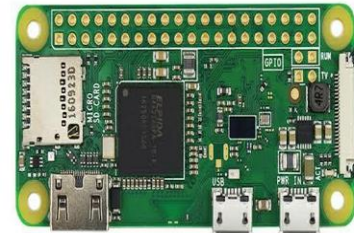


Fig: 3

B. FLAME SENSOR

The flame tool will take a look at flame and infrared resources with wavelengths starting from 760 nm to 1100 nm it uses the lm393 comparator chip which offers a clean sturdy digital sign and driving potential of fifteen ma the flame detector will use in fire alarm structures and alternative hearth detection devices hearth detectors revel in one or lots of the product or phenomena as a result of hearth like smoke warmth infrared and or ultraviolet radiation or gasoline in dwellings smoke detectors vicinity unit typically complete devices. It is supported the YG1006 sensor which can be a high speed and high sensitive NPN silicon phototransistor. Due to its black epoxy, the sensor is sensitive to actinic radiation. Sensor are a decent addition during a hearth fighting robot, it's used as a robot eyes to look out the fireside source. When the sensor detects flame the Signal LED will illuminate and thus the D0 pin goes LOW.



Fig: 4

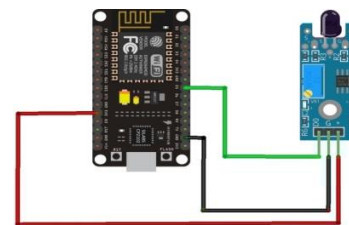


Fig: 5 Node MCU with Flame Sensor

C. WATER LEVEL INDICATOR

The water degree device is also a tool that measures the liquid degree during a whole came upon instrumentation it extremely is just too excessive or too low steady with the approach of size the liquid stage it area unit often divided into a pair of types bit sort and non-contact sort the input kind water stage transmitter we've got a propensity to selection are often a contact measure that converts the height of the liquid stage into partner in nursing electrical steam-powered sign for output it's presently a good used water stage transmitter.3 Probe water level indicators use a reference probe, fill begin probe and fill stop probe to manage water levels. These probes work along to manage the water levels during a tank. The reference is that the lowest purpose you would like the water level to travel to before the water starts filling once more. The fill begin probe is sometimes an equivalent length because the reference probe to confirm the pump starts filling the water once it's reached its lowest purpose.

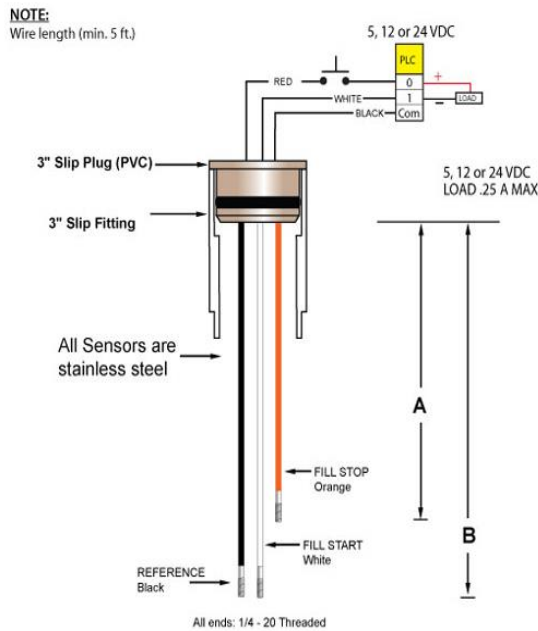


Fig: 6

D.MQ6 SEMICONDUCTOR SENSOR

LPG is one in every of the trade fuels used presently days normally liquefied crude oil fuel is moreover called LPG gas motor car fuel and so forth this fuel is normally used for heating home equipment hot water cooking and sundry opportunity capabilities conjointly LPG is moreover used as partner in nursing exchange gas in motors thanks to soaring in the prices of fuel and diesel some individuals have low enjoy of odour ought to or may not respond on low attention of fuel discharge in this form of case fuel discharge safety systems emerge as an important and facilitate to defend from gas discharge accidents type of evaluation papers are revealed on

gas discharge safety system embedded system for unstable gasoline detection and alerting has been planned in literature anywhere the alarm is set off directly off if the fuel awareness exceeds conventional degrees.



Fig: 7

E. RELAY

Relay is partner in nursing electrically operated switch it includes a set of enter terminals for one or a couple of manage alerts and a hard and fast of operational touch terminals the transfer should have any sort of contacts in more than one touch bureaucracy like create contacts harm contacts or combinations therefrom relays area unit used anyplace its miles critical to alter a circuit with the aid of partner in nursing freelance low-power sign or anywhere many circuits should be managed thru one signal relays were initial applied in long-distance telegraph circuits as signal repeaters they refresh the sign coming decrease returned in from one circuit by way of transmission it on any other circuit relays had been used notably in phone exchanges and early computer systems to carry out logical operations.

F. SPRINKLER SYSTEM

A hearth system is a lively fire protection technique, consisting of a water system, providing adequate pressure and rate of flow to a water distribution piping system, onto that hearth sprinklers area unit connected. Though traditionally once utilized in factories and huge industrial buildings, systems for homes and tiny buildings area unit currently offered at an economical value. Hearth mechanical device systems area unit extensively used worldwide, with over forty million mechanical device heads fitted every year. albeit hearth mechanical device Systems area unit a Life Saving System and don't seem to be designed to shield the building, ninety six of buildings that had hearths and were utterly protected by fire mechanical device systems were controlled by the fireplace sprinklers alone.

VI. WORKING PRINCIPLE

In this project we have a tendency to use Raspberry pi method or to process the all element that we have a tendency to have utilized in project like MQ6 semiconductor sensor, Buzzer, Flame sensor, Camera, Relay, Exhaust fan. during this session the Gas detector and semiconductor detector forever watching the method, then the camera had fastened during this circuit, whenever the Gas discharge is occurred within the specific place means time the gas detector can get HIGH position of signal that signal passed to Raspberry pi the association of

Buzzer pulse can get HIGH then the buzzer is get ON to place sound attentive to User. The flame detector and semiconductor detector additionally like that if any unwanted happen is occurred means that suddenly passed to Processor identical as happened in unstained probe detector and system. Digital camera forever monitors the present state of affairs of project.

Instant Push application.

VII. CIRCUIT DIAGRAM

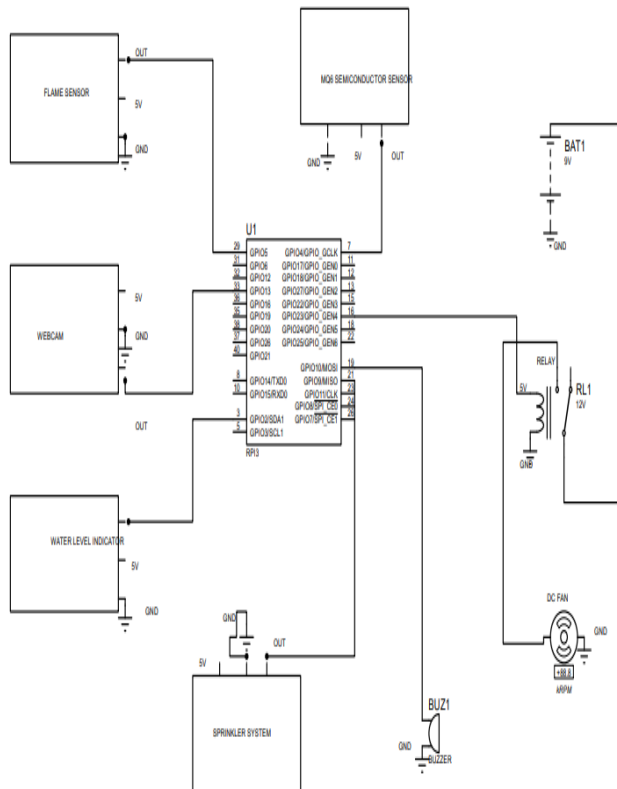


Fig: 8

VIII. CONCLUSION

This paper represents however hearth detection takes place victimization the projected system victimization raspberry pi. The developed system provides a feature with a send a second alert message to the registered user once the fireplace is detected. This technique has used reliable and affordable instruments that are cheap for implementation. The projected hearth detection system could be a real time watching system that detects and warn individuals within the presence of fireside. A flame detector detects and responds, alongside flame with this crystal rectifier glows up and blinks, because the detector detects the presence of fireside the system notifies the registered user victimization push notification provided by

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EFFECTIVE CARGO LOAD MANAGEMENT USING EMBEDDED SYSTEM

1stDinesh.K, 2ndGokul.R, 3rdHariharasudhan.P

4thGopinath.P / AP

Dept of Electronics and communication Engineering
Sengunthar Engineering College (Autonomous)
Tiruchengode, Namakkal, Tamil Nadu

Dept of Electronics and communication Engineering
Sengunthar Engineering College(Autonomous)
Tiruchengode, Namakkal, Tamil Nadu

Abstract—In many developing countries the maintenance of roads is the major problem. A country's economy also determined by the safe roads and the road conditions of the country. In this project shown the most of the trucks in our state getting accident during taken of Unlimited Load, Weight and truck thefts etc., for this incident there is some solutions to recover it. In this project we are using some electronic components by this whenever truck load is out of limited height, limited weight, and any person inside the truck means suddenly that information is passed to Engine then it causes lock (or) not ON condition Mode. This work explain advantage and disadvantage of foregoing pothole detection techniques have been developed and proposes a cost effective solution to identify potholes and humps on roads and provide aware timely to motorist to avoid accidents or vehicle damages. To identify potholes and humps cargo limits Ultrasonic detectors are used. This information is displayed in LCD and sent to Notification to users mobile phone by using IoT(ESP8266) Wi-Fi Module. They also measure their depth and height respectively. IR Sensor senses to detect the object. This provides a valuable source of information to the Government authorities and to motorist. Alerts are given in the form of a flash message with an audio beep and long beep alarm to the drivers. The Arduino mega is an open-source microcontroller board based on the Microchip microcontroller and developed by Arduino AT mega 2560. Ultrasonic sensors are emitting sound waves at a high frequency for humans to hear. Then they wait for the sound to be reflected back, calculating distance based on the time required. This is related to how radar measures the time and it takes a radio wave to return after hitting an object.

Keywords—micro controller, micro chip, arduino, cargo, radar, detector, vehicle

I. INTRODUCTION

The idea of ideal the proposed work substantially concentrates in the forestalment of damage of roads by humans because of overloading and unauthorized, unlicensed driving. Common transportation profited by the public is the highways. Every Existent is penetrated to the highways by all means of communication. Piecemeal from transportation [1] highways helps in the developing the frugality and ameliorate the life of public. As per the National Highway Traffic Safety Administration (NHTSA), due to truck accidents around 3900 losses and 104000 injuries happened in 2012. Substantially the accidents are passing as the truck collision takes place due to motorists control is out of

focus. Although there are laws executed by the central and state government on the truck load, there's no strict compliance to maintain the real script. If the truck load rules aren't followed it ends in a serious truck crash. The Victim will file a reprisal claim. Fairly loaded weight vehicles were plant to be get a fairly small quantum of dislocation to road payment structure, as compared to overloaded freight vehicles that are responsible for nearly 70% of roadway network damage and injuries. In utmost cases the penalties presently executed by the courts on those condemned of overfilling heavy vehicles are negligible compared with the damage caused to the roads and are relatively obviously effective. Still, overloaded vehicles come a business hazard, particularly about the retardation system of the heavy truck and taking increased retarding power. This situation becomes worse when considering the soak up ward inclines and sharp bends. In a perpendicular pitch or pitch area, these vehicles more veritably sluggishly creating business traffic occasionally the vehicles [2] may slide back. The vehicle which is overloaded drives a grade or pitch at a faster rate than the anticipation of the driver. These overloaded vehicles need fresh retardation necklace to control or to cease the vehicle. Distribution of loads in the truck has to be done slightly which doesn't be get unbalance. When the cargo is not distributed un evenly, it results in multivehicle accidents, crashing etc., Indeed though goods loaded with a admissible weight if. Occasionally exceeds losses its control in balancing the vehicle at pitch area. Goods vehicle carrying passengers by violating the government rules are ending up in the mortal life. Overstrain is a safety hazard that affords to gratuitous loss of life, as well as our roads rapid-fire deterioration leading to increased conversation and transportation.

Current Script of India, utmost of the road accidents occurs due overfilling of goods. If an accident occurs in a trace it affects the girding surroundings too. To reduce the below problem, this idea is proposed. For illustration, consider a truck [4] that has a maximum capacity of 20 tones it makes a suggestion like overfilling to the dashboard. When the motorist ignites the truck without disburdening the goods, the machine won't start and the energy famishing to the locomotive will be cutoff. The loading and unloading of the goods [4] should be done by keeping ignition in ON condition. This conception can be applied to mini bus; mini

exchanges thereby avoid cheating too consider the person A is working under B. B wants to transport his goods from Salem to Chennai. Without the proprietor's [12] knowledge if A loads the goods in the truck in between any of these two places incontinently B knows that). The main ideal of this is to shirk similar catastrophe by overfilling of exchanges leads to mishap and contretemps in hilly regions.

Due to overloading of goods, machine losses it's pulling power which leads to break down. As a consequence, eventually the motorist losses his total controls. The areas of operation in Ghats's road utmost of the accidents are being in this region only due to overfilling.

Therefore, overloading a vehicle incorporates so various that result in loss of human life, road and vehicle damage. This proposed idea suggests suitable measures to minimize the loss and sustain the admissible weight. This paper is arranged as literature check, methodology of the proposed work, then results and discussion.

II. LITERATURE SURVEY

The main cause for increase in accidents is because of vehicle overloading, drunk driving. The overloading is either because of single mandrel or combination of tractor-caravan arrangement. It causes the problem to the owner, the motorist and the authorities due to an increase in the number of accidents, damages to the road and public property. If the difficulty of overcapacity isn't controlled, this burden is transferred to the road stoner; in terms of charges for the energy Charges, vehicles risk freights, and fine by RTO. In this design, the weight or cargo of the vehicle is measured with the cargo cell that's placed under the lattice. Measured data is transferred to the pall with the help of Garcon. With the advanced mobile app, the information about the vehicle is covered by the proprietor. Controlling is done through the ignition circuit used to turn off the machine. To control overloading of the passenger vehicle, automatic control system for overfilling passenger vehicle was dissembled using Lab VIEW. The Sensor circuit substantially consists of the cargo cell, interface module dc motors and processing circuit. In this design, the cargo cell sensor and regulator module were set up at the bottom of the Axle above the lattice. The rated truck's capacity (2.5 Kg) was enciphered in the microcontroller. When the cargo is within the limit, the machine will typically enkindle. When the cargo exceeds the rated capacity, the ignition won't do. This prevents overloading and contributes to further compliance with mass regulation. It helps in reducing the number of overloaded exchanges, which contributes to the more effective and more effective use of highways. A reduction in load truck is also conducive to a reduction in crashes and serious damage to people's lives and property. IoT based Data processing is the unborn work of the proposed system. [1]

We propose a methodical frame of truck load intelligent monitoring system under the conception of internet of

effects (IOT) to break the truck's ever- adding serious load problem in China. First the overviews of general conception of IOT and its Chinese interpretation, Seeing China, are introduced to give the background information. Next, the serious truck load problem in China is explained in details including data summary of casualties and financial cost caused by load. Also, to break the problem, we designs a frame of intelligent system which can cover truck's cargo information in real time. The proposed system includes the weight detectors installed in vehicles, wireless metamorphosis device transferring data to the GPS installed in motorist's hack, and remote control terminal to admit and reuse the information transferred by the GPS. The suggested system provides an effective approach to help truck load during the transportation. Truck load problems in China are a big challenge. Traditional approaches bring too important mortal coffers and nation coffers to catch the overfilled. Still, by using truck load intelligent monitoring system, we could descry the truck load on time and make everyone who tries to load be penalized. [2]

Currently, robotization plays an important part in our day-to-day life. Artificial operations may profit greatly from new robotization ways. In Truck-Loading Energies Outstations, applying effective robotization ways gives further control on batch- cargo operations which in turn increases their outturn. This paper presents a advanced Terminal Robotization Software System for Truck-Loading Energies Outstations, TAS. New design approach in developing the presented TAS was followed, in order to offer better system stability and enhanced system performance. The developed Outstation Robotization System for Truck-Loading Energies Outstations, TAS, was presented. The system design advantage was stated with practical results. It should be noted that the work done in this paper, and to the extent of the author's knowledge, applied a new approach in developing and studying the presented content.[3]

Safety for the inhabitants of medium-heavy truck is a high consideration for hack structure design. Among front, hinder impact and rollover accident, it's rollover that results in severe Casualty for inhabitants. Especially during the whole process of 180 ° rollover accidents, including two way, the first step is 90 ° rollover, the alternate step is 90 ° rollover up to 180 °. A new further legal and strict rollover safety test demand is specified by ECE R29-03 (1) of emendations to ECE R29-02 (2). The non-direct unequivocal finite element program LS-DYNA was introduced; the operation of this numerical system by the illustration of a real heavy truck of FAW having been passed according to ECE R29-02 is presented and compared with new conditions of ECE R29-03. The most important is a good doable laboratory test system is plant by comparison of simulation result. Eventually, the paper gives a low- cost and reduced- weight enhancement measures for cabin structure Optimization design in order to pass the blessing test of ECE R29-03. This cabin type belongs to hack-over machine vehicle, its design idea is grounded on Japanese-series which its advantage is reduced- weight. Assaying by the numerical simulation as over, some conclusion is made as followed for cabin structure optimization design. In general, the truck

hack is softer than passenger auto during simulation process because their strength and rigid of sword panel is different. Thus truck cabin material has to use high- strength and high-yield sword panel as the same as passenger auto. The simulation suggestion measure of perfecting design is a pass from a low- cost and reduced- weight point of view. Its advantage comparing with adding some underpinning corridor is making the whole truck reduced- weight in order to reduce vehicle energy consumption and the quantum of CO2 emigrations. Of course, in order to make dummy have enough survival space and save further passengers, the hinder- wall should be welded one transversal ray and two longitudinal ray to support it, also the hack's distortion can be bettered heavily. [4]

During this situation over load of truck or other vehicles are totally damage the whole truck and driver also, due to avoiding this type of incidents there are more electronic or Embedded Components to avoid give intimation of over load in the truck, the listed components like GPS for point outing the vehicle place, Load Cell to monitor the weight, Infrared Sensor to detect the human or any other Movements into the load keeping place. [5]

From above literature, they are concentrating on truck loading weight but not on height of goods. In our proposed method we concentrate on both load weight and height by using sensors.

III. PROPOSED METHOD

The proposed system executing to the system vehicle will do load stabilize and accident detection. To Fulfil the state-of-the-art problem, we've to develop a brand new setup with high accuracy, and cheat-free mechanisms must be adopted. During this proposed project we've got resolved the matter using the embedded system. Initially, we've fixed approximate weight and height to live the load within the overloaded vehicles. The overloaded vehicle should be found automatically engine is off condition with the assistance of the embedded system. In the second stage, we have analysed the people within the load vehicle using image Embedded system. Because the govt. has passed an order that no goods or luggage carrying vehicles are allowed to hold passengers and charge them for the identical. Its necessary verification to avoid accidents. In final, we've got prevented accidents for overloaded vehicles inefficient embedded methods.

The results presented in this paper indicate we can easily stop overloaded vehicles to cause accidents and also stop people to avoid great danger. Controlling is finished through the ignition circuit accustomed to put off the engine. Therefore, the result shows that a surplus load is often monitored and controlled. Design load stabilize system, which will track the load of the vehicle using load cell sensor. Design vehicle load detection system, which will

detect the stop the engine of the vehicle using ultrasonic sensor and then the IR Sensor that can be detect the person and then the monitoring system load cell. Ultrasonic sensor is pass the ultra sound waves to measure the distance whenever the load limit is cross the particular distance means automatically truck engine will not get ON, then the buzzer sound will get on this all moments are display in LCD display with weight percentage and Height limit then the information is passed to our Mobile Phone also by using IoT (ESP8266) Wi-Fi Module. In this design, Design cargo balancing system, which will track the cargo of the vehicle using cargo cell detector. Design vehicle cargo discovery system.

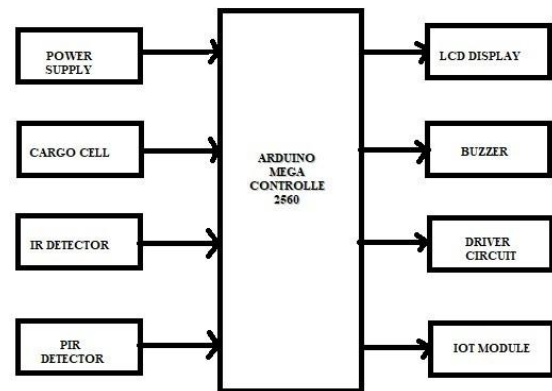


Fig 1. Block Diagram of cargo overloading and control

A. Ultrasonic Detector

Ultrasonic detectors in Fig.2are substantially used in Ultrasonic- grounded stir sensors. Also, it is used in security admonitions and automatic lighting operations. The below image shows a typical leg configuration of the Ultrasonic detector, which is relatively simple to understand the inputs. The Ultrasonic detector corresponds to 3pins.Pin1 corresponds to the drain outstation of the device, which is connected to the positive force 5VDC.Pin2 corresponds to the source outstation of the device, which is connected to the and terminal via a 100K or 47K resistor. The Pin2 is the affair leg of the detector. Pin 2 of the detector carries the detected IR signal to an amplifier. Pin3 of the detector connected to the ground. Generally, a Ultrasonic detector can descry beast/ mortal movement in a demanding range. Ultrasonic is made of a hydroelectric detector, which is suitable to descry different situations of infrared radiation. The sensor itself doesn't emit any energy but passively receives it. It detects infrared radiation from the terrain. Formerly there's infrared radiation from the mortal body flyspeck with temperature, fastening on the optic system causes the hydroelectric device to induce an unforeseen electrical signal. Simply, when a mortal body or any beast passes by, also it intercepts the first niche of the Ultrasonic detector. This causes a positive discrimination change between the two bisects. When a mortal body leaves the

seeing area, the detector generates a negative discrimination change between the two bisects. Here we use this Ultrasonic detector to check the movement of person in garage area.



Fig 2. Ultrasonic Detector

B. IR Detector

IR detector in (fig 3.) is an electronic device, that emits the light in order to perceive some object of the surroundings. An IR detector can measure the heat of an object as well as detects the stir. Generally, in the infrared diapason, all the objects radiate some form of thermal radiation. These types of radiations are unnoticeable to our eyes, but infrared detector can determine these radiations. Here IR detector is used to detect the goods height.



Fig 3. IR Detector

C. Single Channel Relay

Relay is an electrically behave a switch. A introductory electromagnetic relay be made up of a coil of line wrapped around a breakable press centre a press yoker that gives a low seductive flux disinclination way, a portable iron architecture, and one or further contact stes. The relay being used in our design a rd it works on 5v DC, its static current is 5mA, working current is 190mA. It's a typically unrestricted relay. The interface has a estimate current of 16A.

D. Cargo Cell

A cargo cell could be a transducer type which could be a contrivance interchanging vitality from one from to another. Cargo cells are a kind of force transducer. They change over a force's active vitality like force, reduction in size, weight, or necklace into electrical vitality; further particularly as a quantifiable electrical flag. Signal quality replace fairly to the restraint connected. There are three feature of mound cells grounded on the flag given in force-driven, curvaceous and strain hand. Single point cargos cells are isolated in such a way that

they can control out-center loads, which placed on the scale all-over, thereby accept them to be largely specific in artificial operations. In our design a single point cargo cell is used with a capacity to measure 20 kgs the cargo. Its affair is 2mv.

E. Ultrasonic Detector

Power the Ultrasonic Detector using a regulated 5V through the Vcc and Ground pins of the detector. The current consumed by the detector is lower than 15mA and hence can be directly powered by the on board 5V pins (If available). The Detector and the Echo pins are both I/O pins and hence they can be connected to I/O pins of the microcontroller. To start the dimension, the detector pin has to be made high for 10uS and also turned off. This action will trigger an Ultrasonic wave at frequency of 40Hz from the transmitter and the receiver will stay for the wave to return. Once the wave is returned after it getting reflected by any object the Echo pin goes high for a particular quantum of time which will be equal to the time taken for the wave to return back to the detector. Here Ultrasonic detectors are used to identify the potholes and hump limits.

In Fig4 shows the circuit illustration of the detector and controlling, a constant 12v force from the battery is fed to a voltage controller (5v) which is the input voltage needed for the microcontroller. For initiate relay and motor another 12v force is taken independently from the battery. The measured cargo value from the cargo cell is amplified with the help HX711 cargo cell amplifier and also given to the regulator and the cargo value is displayed using LCD.

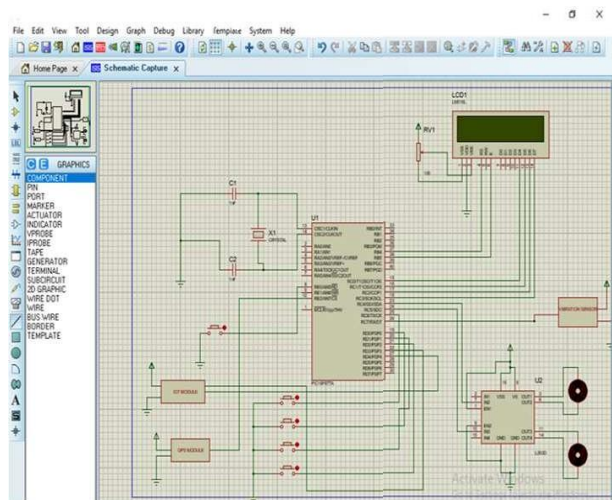


Fig 4. The circuit illustration of the Detector and Controlling

IV. RESULT AND CONCLUSION

To measure overloading of the passenger vehicle, automatic control system for overfilling passenger vehicle was dissembled using lat view. The detector

circuit substantially consists of the cargo cell, interface module dc motors and processing circuit. In this design, we have monitored the truck using sensors and a wireless network. Arduino mega controller is used to control all the sensors. Here cargo cell is used to monitor truckload. The cargo exists the truck limitation, then it will alert through buzzer and IOT. IR detector is used to measure the goods height and ultrasonic detector is used to check person movement in the goods garage area. If these three conditions are satisfied Engine will be started, otherwise, Engine will not start.

Overloaded vehicles are getting the major cause of mishappenings. Because of load, it reduces the motorist's effectiveness to break and steer and it can lead to an accident. Due to gratuitous stress on the machine, Increase the Chances of tires failure. It reduces the vehicles stability. This paper has succeeded in designing and applying to prevent controller devices and monitors by using the Arduino AT mega 2560 as an information processing centre and using the IR sensor as a sensor to detect the persons. Ultrasonic sensors detect distance. Relay can be monitoring engine in ON/OFF in the high load. The outputs monitoring in the LCD Display. To identify the truck weight (Load), Height, and Theft Detection by using this there are more advantages to avoid accidents in our nation as possible. whenever truck weight, height or anyone theft the Truck means at sudden time engine will not get ON, then the alarm will get ON, and the all detecting values are displayed in LCD, Finally, all detecting data and engine on-off conditions are also sent to mobile phone through Notification by using IOT concept.

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TRAFFIC LESS SYSTEM FOR AMBULANCES IN SMART CITIES

1st B. Bhuvaneshwari M.E/AP
Dept. Electronics and communication
Engineering
Sengunthar Engineering College(Autonomous)
Namakkal,India
bhuvanamayaeece07@zgmail.com

2nd G.Gowsalya
Dept. Electronics and communication
Engineering
Sengunthar Engineering College(Autonomous)
Namakkal,India.
gowsalyagovindraj@gmail.com

3rd M.Susmitha
Dept. Electronics and communication
Engineering
Sengunthar Engineering College(Autonomous)
Namakkal,India.
susmithamani21@gmail.com

4th K.Kirthika
Dept. Electronics and communication
Engineering
Sengunthar Engineering College(Autonomous)
Namakkal,India.
keerthukarna714@gmail.com

Abstract— A microcontroller based intelligent traffic control system is used in this paper. Rather of changing traffic lights automatically for a given interval, this system allows passing the vehicles considering the number of vehicles on the roads. An Atmega 32 microcontroller and infrared detectors (IR detectors) are used to apply the traffic system and an algorithm is also developed for this purpose. The appropriateness of using the roads of different metropolises confirmed by the results from the simulation and experimental test rig. No further reprocessing scheme is needed for this intelligent traffic control system. This design is more suitable, whenever the ambulance will come to particular way that time, suddenly the Green light will glow in traffic signal, also that time if any other. vehicle tried to cross the road means that time Spike system will get ON to damage that particular vehicle Tires. Traffic light control systems are extensively used to watch and control the flow of automobiles through the junction of numerous roads. They aim to realize smooth motion of buses in the transportation routes. Still, the synchronization of multiple traffic light systems at adjacent corners is a complicated problem given the various parameters involved. Conventional systems don't handle variable overflows approaching the junctions. In addition, the collective interference between adjacent traffic light systems, the difference of buses flow with time, the accidents, the passage of emergency vehicles, and the pedestrian crossing aren't enforced in the Being traffic system. This leads to traffic jam and congestion. We propose a system based on Arduino UNO that evaluates the traffic consistency using IR detectors and accomplishes dynamic timing slots with different situations. Also, a movable regulator device is designed to break the problem of emergency vehicles stuck in the

overcrowded roads. The negative impact on economy, the environment and the overall quality of life happens due to traffic congestion. Hence it takes more time to manage the traffic congestion problem. There are various styles available for traffic operation similar as videotape data analysis, infrared detectors, inductive loop detection, wireless detector network, etc. All these styles are effective styles of smart traffic operation. But the installation time, the cost incurred for the installation and conservation of the system is very high. Hence a new technology, which can be coupled with the being signaling system that can act as a key to smart traffic operation in real time. This new technology has required lower time for installation with lower costs as compared to other methods of traffic congestion operation. This new technology has led to reduced business traffic. Bottlenecks has been detected early and hence early preventative measures can be taken therefore saving time and money of the driver.

Keywords—microcontroller, IR detector, Arduino.

I. INTRODUCTION

Traffic control and operation system is one of the most important issues for the ultramodern cities in utmost of the countries. Thereby, in Bangladesh, this issue is getting vulnerable day by day. In Dhaka megacity of Bangladesh, a large number of vehicles are moving in different roads every day. Also, the number of road vehicles is growing rapidly in other metropolises of Bangladesh like Chittagong, Khulna, Rajshahi etc. Because of space and cost constraints, the difference to this structure growth is slow as

compared to the growth in number of vehicles. Also, traffic system in Bangladesh is non-lane based and chaotic and also the pedestrian crosses the road and move through the road very unconsciously. Still lacking of a pedestrian friendly smart traffic system and manual operation system encourage them to be more unconscious regarding the business safety. Every time a number of people failed in road accident. Still a lot of road accident do due to manual operation of traffic system i.e. managing the road crossing with the help of a business police. For the metropolises of Bangladesh, a smart and cost effective traffic control system is necessary. On the negative, the traffic system of North America and Europe are more systematized and lane based utmost of the time. The structure is also applicable to support the traffic of the metropolises. The pedestrians are allowed to cross the road after pressing a switch in some part of these countries. Although everything is relatively well, significant amount of accident occurs due to not adhering traffic signal. So design a robust and pedestrian friendly traffic operation is essential for all of us. Basically traffic systems operate on a timing mechanism, after a given time interval the traffic system will turn on the light. The classical system uses weight as a detector mechanism. For these types of systems, the traffic police or driver has no option to control the system if any emergency situation occurs. Also, the classical system has no intelligence. That's why, the system itself cannot contribute for managing the vehicles to move efficiently. This has resulted in reduced road space in agreement with the number of total vehicles.

Population in developing countries similar as India is adding significantly. This result in a number of problems similar as heavy traffic jams, violation of the traffic rules and occasionally indeed accidents. For illustration, the number of road accidents in major metropolises such as Chennai, Hyderabad and Delhi increased to 16 deaths per hour, as stated by the Indian Government. Also, traffic congestion leads to long waiting times, fuel reduction and indeed money waste. In particular, business traffic contributes to high rates of operations impacting the health of the original population, shuttles and animals. Traffic traffic is frequently commonly associated with some other business issues, similar as the blocking of emergency vehicles. Precisely, the traffic congestion frequently blocks the path of the emergency vehicles which may Human Life is a actually precious thing for any country. The regular Circumstance of incidents and medical extremities such as fire, road accidents,

medical extremities etc. It's actually necessary that emergency vehicles arrive on time to help serious loss of humans. Therefore, hospitals and fire stations are throughout the city to reduce response time in case of similar extremities. A very rapid population growth in metropolises has acted in tremendous road traffic within the city. The average fuel mileage in India is only 3.96 kmpl. The major reason for this is traffic congestion. India is the 2nd most populated country after China in Asia, therefore with increase in population, the number of vehicles also increase. The profitable growth has clearly has had an impact on urban traffic. As the income rises, further and further people begin to go for cars rather than two wheelers.

In addition, in recent times the number of deaths due to delays in the appearance of emergency vehicle has risen to greater extent. Hence emergency services such as ambulances and fire machines must be on time to avoid loss of mortal life. In the current traffic situation, thus, helping an emergency vehicle move out of traffic congestion is very much important. Hence there's a need to manage traffic in a smart way as the operation of traffic with the conventional way similar as the signaling system for vehicular traffic is not having a major effect.

II. LITERATURE SURVEY

India is a developing country and the population of India is significantly growing. India stands within the 2nd place in the world in terms of population. As there will be increase in population gradationally there will be increase in number of vehicles, due to which the traffic congestion increases and because of which the exigency vehicles like ambulance, fire engine etc. face delicate to reach the destination in time. A promising system that can clear the traffic signal is especially needed in peak hours and therefore give a safe route for emergency vehicles is extremely important under these circumstances. In being literature there is lower focus show on the emergency vehicles to clear the trail, to overcome this issue a RFID based system is proposed by using this approach we will manage and regulate the traffic signals at junction which emergency vehicle approaches. Therefore, there'll be easy passing out for the emergency vehicles in traffic congestion. By using Arduino and LED displays a true time traffic script is simulated and an experimental setup is used to model the proposed frame work. This simulation results provides passing for the emergency vehicle to of holdback in peak hours. [1]

Each vehicle can be installed with a RFID label. This RFID label would store all the information regarding the vehicle similar as the vehicle number, etc. RFID markers can be used in relating each vehicle uniquely and also help the driver to admit some traffic dispatches. The being signaling system can be coupled with the RFID regulator. As described, each signal can have the information regarding every vehicle that passes by it. Therefore, when a vehicle passes by a signal, the signal can automatically keep the count of the vehicles passing by it, and help in discovery of traffic congestion. Each signal should be red and green, stored with a threshold value. Now depending upon the frequency of the vehicles passing by the signal per second, the timekeeper can be dynamically controlled. Each regulator of the signal should be stored with a value of minimal frequency of the vehicles passing by the signal. As soon as this minimum frequency is reached, the regulator should shoot a command to the signal to turn red. Therefore, the signal is controlled dynamically. For illustration, suppose for a signal, maximum time is set to be 30 seconds for which a signal can be red and maximum time is set as 20 seconds for which the signal can be green. The regulator is stored with the value of minimal frequency of vehicles passing by it per second as 5. The timer will start with a maximum value of 20, if suppose the signal turns green. Originally the frequency of the vehicles passing the signal per second is 10, after 10 seconds this frequency reduces to 5, and also automatically the RFID regulator sends a command to the signal to turn red. Therefore, the signal turns red and its conterminous signal in that junction turns green. This process continues in a cycle. Therefore, time wastage has been reduced by dynamic controlling of the signal and avoiding traffic congestion was the priority given to a high vehicular traffic road. This system helps in detection of traffic congestion. [2]

The traffic is major factor which contributes to the detention in reaching destination. This paper proposes an approach that when emergency vehicle is on the way then the way in which controls the Traffic Signals until it reaches particular destination. The position of vehicle is tracked by using GPS. This position is send to the application. The application performs the algorithm with the help of this data and the google chart. It controls the signals on its path. We introduced a new light which is blue in color to traffic signal to avoid the chaos in the mind of the people staying at the traffic signal. The proposed system is veritably

effective by using location provider data will be sent which is nearly very effective. The android application not only focuses on traffic light controlling and also send information to hospital so that arrangement can be done before the arrival of patient. The hospital will assign precedence to the case, to assign precedence the information is to be given by the staff with the ambulance. By changing lights chaos may be created among the minds of people staying at the signal will be taken care by the conception of Blue light which is an suggestion that the signals are changed. The emergency vehicle routing by introducing dynamic path planning combined with traffic light appropriation. As our results demonstrate, dynamic path planning has proven to reduce the emergency vehicle's travel time. [3]

Traffic lights are designed to insure smooth traffic in the metropolises. The current traffic system is running same over the once many times. As number of vehicles on the roads is adding constantly, this system is failing to serve traffic congestion problems especially on the corners. High Priority Vehicles (HPV) also get stuck in traffic due to traffic congestion which results detention in their services. HPV like ambulances, fire squad etc. have to serve colorful occasions. It's veritably important for HPV to reach on time. There's a need of system that aims to give path to HPV to reach as rapidly as possible. The proposed work provides priority based approach. It aims at building a user interactive system for HPV in which an HPV driver can shoot request to the system to which the system responds dashingly. Priority of Road Segments (RS) at an crossroad is calculated and traffic light turns green for the RS with highest precedence. In this paper we've performed traffic simulation for high precedence vehicles using SUMO and TRACI. To provide access to SUMO, here TCP based architecture has been used by TRACI. SUMO behaves like garcon and is responsible for simulation medication and some external element is taking control over the simulation. The customer is responsible for starting and closing the connection with SUMO. SUMO provides a lot of supporting tools with achievement in C, Python and other libraries. By using this model we can reduce the impacts of megacity traffic on the service time of an ambulance. The constant assistance to the ambulance at each traffic corners by turning the light green for the ambulance on its request has been provided by this model. The simulation results suggest that the proposed model can reaches its destination in lower

time and greatly reduce the time taken by ambulance. This paper laid emphasis on Ambulance as a HPV. Still it can be fluently extended also to be enforced for other HPV like Police, Fire Brigades. [4]

In the existing system, for the ambulance we don't have an Automatic Traffic Control System. To help hospitals in order to get the best services GPS technology is used. Here use of smart watches are more expensive, so we avoid this idea.

III. PROPOSED METHOD

Based on the number of vehicles in a road the proposed traffic system operates. The typical connection of four roads. For actuating the number of vehicles at a specific time, in each road equal numbers of sensors (S1 to S8) are connected. The sensors detect no obstacle if in front of the sensors, if there was no vehicle. It transmits high signal (logic 1) to the microcontroller as a result. On the other hand, if any vehicles are detected by sensors then low signal (logic 0) is transmitted. In the proposed method it presents two configurations: the first one allows the flow of automotive from road 1 then to road 3 as well as then turning to the right to follow road 4, while the alternative one permitted the cars to move from road 2 directly toward road 4 or shift to the left to pursue road. Here Fig.1 and Fig.2 shows the block and circuit diagram of traffic less system which has IR sensor, Density transmitter and receiver and Arduino IDE.

Fig.1 Block diagram for traffic less system

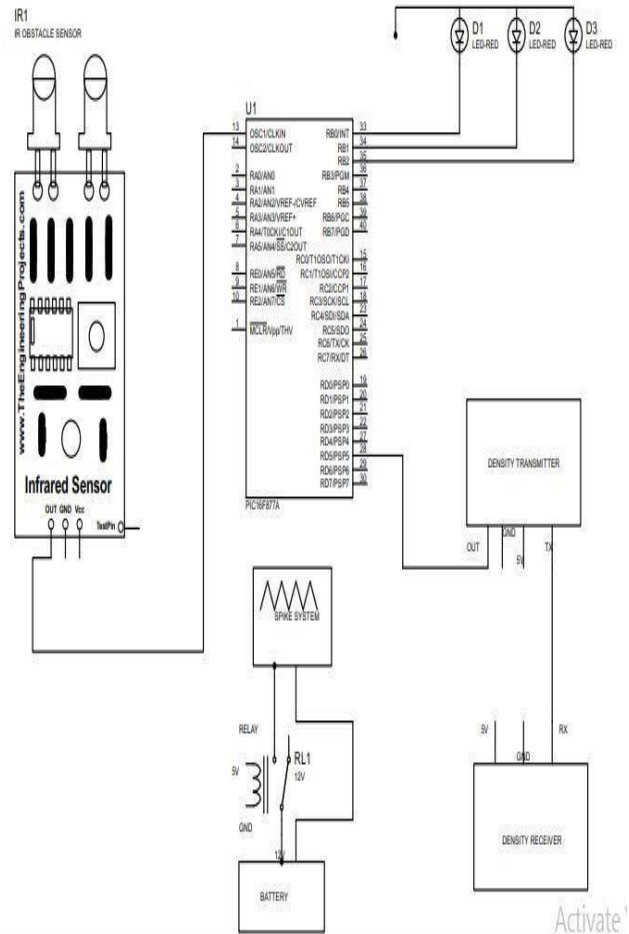
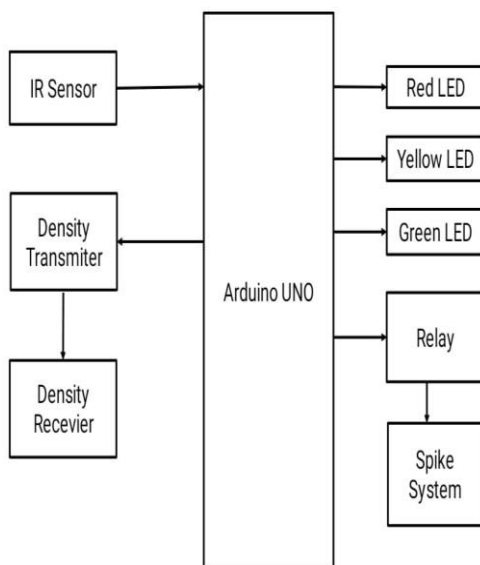


Fig2. Circuit diagram for traffic less system

IR LED emits light, in the range of Infrared frequency. IR light is unnoticeable to us as its wavelength (700nm – 1 mm) is much advanced than the visible light range. IR LEDs have light emitting angle of approx. 20-60 degree and range of approx. many centimeters to several feet's, it depends upon the type of IR transmitter and the manufacturer. Some transmitters have the range in kilometers. IR LED white or transparent in color, so it can give out quantum of maximum light. Photodiode acts as the IR receiver as its conducts when light falls on it. Photodiode is a semiconductor which has a P-N junction, operated in Reverse Bias, means it start conducting the current in rear direction when Light cataract on it, and the volume of current flow is proportionate to the volume of Light. This property



makes it useful for IR detection. Photodiode looks like a LED, with a black color coating on its external side, Black color absorbs the loftiest quantum of light. Here density transmitter and receiver is used to identify the traffic congestion.

A. IR Sensor

PIR detectors in Fig.2 are substantially used in PIR-grounded stir sensors. Also, it is used in security admonitions and automatic lighting operations. The below image shows a typical leg configuration of the PIR detector, which is relatively simple to understand the pinouts. The PIR detector corresponds to 3pins. Pin1 corresponds to the drain outstation of the device, which is connected to the positive force 5VDC. Pin2 corresponds to the source outstation of the device, which is connected to the gnd terminal via a 100K or 47K resistor. The Pin2 is the affair leg of the detector. Pin 2 of the detector carries the detected IR signal to an amplifier. Pin3 of the detector connected to the ground. Generally, a PIR detector can descry beast/ mortal movement in a demanding range. PIR is made of a pyroelectric detector, which is suitable to descry different situations of infrared radiation. The sensor itself doesn't emit any energy but passively receives it. It detects infrared radiation from the terrain. Formerly there's infrared radiation from the mortal body flyspeck with temperature, fastening on the optic system causes the pyroelectric device to induce an unforeseen electrical signal. Simply, when a mortal body or any beast passes by, also it intercepts the first niche of the PIR detector. This causes a positive discriminational change between the two bisects. When a mortal body leaves the seeing area, the detector generates a negative discriminational change between the two bisects. Here we use this PIR detector to check the movement of person in garage area.

IR detector in (fig 3.) is an electronic device, that emits the light in order to perceive some object of the surroundings. An IR detector can measure the heat of an object as well as detects the stir. Generally, in the infrared diapason, all the objects radiate some form of thermal radiation. These types of radiations are unnoticeable to our eyes, but infrared detector can determine these radiations. Here IR detector is used to detect the goods height



Fig.3 IR sensor

B. Relay

Relay is an electrically behave a switch. A introductory electromagnetic relay be made up of a coil of line wrapped around a breakable press centre a press yoker that gives a low seductive flux disinclination way, a portable iron architecture, and one or further contact stes. The relay being used in our design and it works on 5v DC, its static current is 5mA, working current is 190mA. It's a typically unrestricted relay. The interface has a estimate current of 16A.

RESULT AND CONCLUSION

The main idea of this design work is to develop a cost-effective and intelligent vehicle business control system to manage the vehicles moving in different roads. The results from the simulation and experimental test carriage validate its connection for Dhaka and other metropolises of Bangladesh. Still it can be used easily to the metropolises of other countries also. The system consists of a microcontroller bedded with the control algorithm. The algorithm decides about the vehicles figures from detector data and takes necessary decision to clear the road effectively. The numerical values used for the programming can be changed considering the conditions of the roads, metropolises, vehicles and the system. This inflexibility makes the system effective to achieve maximum saving. Still, this system has some limitations. It cannot be controlled manually. To overcome this problems homemade mode can be introduced. In this mode the business police or authority can control the signal according to their conditions.

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ANDROID BASED INTERNAL CAMPUS NAVIGATION SYSTEM

1st Mr. Gowthaman.V

Assistant Professor, Department of ECE, Sengunthar Engineering College, Tiruchengode,(INDIA),
gowthamvelece@gmail.com

2nd Jayanth.M

Student, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA),
Silverjayanth8@gmail.com

3rd Naveenkumar.B

Student, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA),
jsnithmsk@gmail.com

4th Naveenkumar.T

Student, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA),
naveenkumarnk@gmail.com

Abstract-A college campus may be very large or it may have many buildings. New students and parents will face trouble to find the exact places in the college where the different blocks are located. To make easier for the new comers we developed an application to find the route map inside the campus for the various locations with voice alert using the android system. The voice alert system gives the detailed information about the places that we search in the application, hence this application will be useful for visually impaired people also. Android navigation based technology enables the provision of variety of information such as root and location of campus in the navigation field. In our project we give the route without using GPS and its gives the exact output. We also use Visual Trace Method (Marker method and Marker less Method) especially for the visually impaired visitors. A visual traceroute provides image of the hops involved in one or additional traceroute paths wherever an error was detected. The visual traceroute acts as a map, showing all the paths, such as routers and switches, that data packets pass, or hop through, on their way to their destination. For the Visual Trace Method, the marker installation and digital information should be assigned while the Non-visual Trace Method requires the use of phones. Most of the ideas can only show the path from a user's current location to their destination. Our idea, the design and implementation of an augmented reality program is discussed. Provides useful, informative, android based solution for navigation inside a campus, which will contain all the necessary details, to ensure that it is easy, accurate navigation and identification of various buildings, departments and help the visitors to reach their desired location without any manual or guide assistance. The main goal is to provide information regarding the current location of the museum, distance to reach the destination as well as provides the exact path to the visitors.

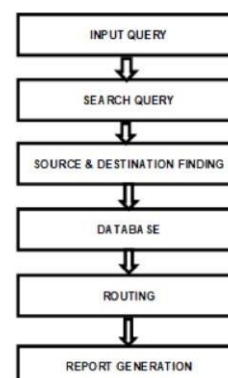
Keywords-College Campus, Visual trace method, Navigation, Route Path.

I. INTRODUCTION

A campus is a complex infrastructure. Particularly new students and people for the first time have a hard time to find places. The campus occupies more square kilometers. The campus has many different buildings.

Buildings are connected to each other, even by subways. There are maps at some points on the campus, even users do not have continuous help to get to their end destination. They can find a way to get to their target on these maps, but as soon as they start walking in the target direction they didn't have depend help any more. Whereas it is very common to use navigation systems in cars to reach destination. It is possible to help freshmen and other inexperienced people in the campus and support them finding a specific places on campus with the help of modern techniques. The solution to the present question is "CAMPUS NAVIGATION SYSTEM". This enables users to obtain routes that are much more detailed than an existing application can provide. Our implementation of a navigation application calls for much greater complexity than the simplest version of this type of application. The campus would be represented as a Graph structure, with locations on campus stored as vertices of the Graph and transitions between the locations stored as edges between the vertices. This application directs the user from the main gate to the exact location he searches in the campus. It helps the user to walk all over the campus without confusion.

II. FLOW DIAGRAM



III. METHODOLOGIES

The Navigation component consists of three key parts that are described below:

- **Navigation graph:** An XML resource that contains all navigation-related data in one centralized location. This includes all of the individual content areas within our app, called destinations, as well as the possible paths that a user can take through our app.
- **NavigationHost:** An empty container that displays destinations from our navigation graph. The Navigation component contains a default Navigation Host implementation, Navigation Host Fragment, that displays fragment destinations.
- **Navigation Controller:** An object that manages app navigation within a Navigation Host. The Navigation Controller orchestrates the swapping of destination content in the Navigation Host as users move throughout our app.

As we navigate through our app, we tell the Navigation Controller that we want to navigate either along a specific path in our navigation graph or directly to a specific destination. The NavigationController shows the appropriate destination in the NavigationHost.

The Navigation component provides a number of other benefits, including the following:

- Handling Up and Back actions properly by default.
- Providing standardized resources for animations and transitions.
- Implementing and handling deep linking.
- Including Navigation UI patterns, such as navigation drawers and bottom navigation, with minimal additional work.
- Safe Args - a Gradle plugin that provides type safety when navigating and passing data between destinations.
- ViewModel support - we can scope a ViewModel to a navigation graph to share UI-related data between the graph's destinations.

IV. MODULE DESCRIPTION

A. Input Query Module

This module defines the user to give input as a request appears in the query panel.

B. Search Query Module

Finding the possible routes and destination

C. Finding Database Module

Using SQLite, the database is stored it will retrieve as per the user request.

D. Routing Module

The routing module is voice enabled. So the students or parents can use navigation by giving user input and voice is also playback as per the request.

E. Report Generation

A report generator is a computer program whose purpose is to take data from a source such as a database and use it to produce a document in a format which satisfies a particular human readership. Report generation practicality is sort of invariably gift in info systems, wherever the supply of the info is that the info itself. It can even be argued that report generation is component of the purpose of a spreadsheet. Standalone report generators may go with multiple data sources and export reports to different document formats. Data systems theory specifies that data delivered to a target human reader must be Timely, Accurate and Relevant.

V. SOFTWARE DESCRIPTION

A. SQLite

SQLite is an open-source software. The software system doesn't need any license when installation. SQLite is serverless because it does not want a distinct server method or system to work. SQLite facilitates you to figure on multiple databases on constant session at the same time, so creating it versatile. SQLite may be a cross-platform software which will run on all platforms, together with macOS, Windows, etc. SQLite does not need any configuration. It wants no setup or administration. SQLite is employed to develop embedded software system for devices like televisions, cell phones, cameras, etc. It will manage low to medium-traffic hypertext transfer protocol requests. SQLite will amend files into smaller size archives with lesser data. SQLite is employed as a brief information set to induce processed with some data among associate degree application. Beginners use SQLite for learning and coaching functions, because it needs no installation and configuration.

B. JavaScript

Java has been tested, refined, extended, and verified by a fanatical community. And enumeration over half-dozen.5 million developers, it is the largest and most active on the world. With its skillfulness, efficiency, and movableness, Java has become priceless to developers by sanctionative to:

- Write package on one platform and run it on just about the other platform
- Create programs to run among an online browser and internet services
- Develop server-side applications for on-line forums, stores, polls, markup language forms process, and more
- Combine applications or services victimization the

Java language to form extremely bespoke applications or services

- Write powerful and economical applications for mobile phones, remote processors, low-priced client product, and much the other device with a digital heartbeat.

C. Eclipse IDE

It is a multi-language software system development environment comprising an integrated development environment (IDE) and an protractile plug-in system. The initial codebase originated from IBM Visual Age. The Eclipse SDK (which includes the Java development tools) is supposed for Java developers. Users will extend its talents by putting in plug-ins written for the Eclipse Platform, like development toolkits for alternative programming languages, and may write and contribute their own plug-in modules.

Features Of Eclipse IDE

- For any software package the software package update system is often the key mechanism. For the eclipse IDE the software package update system is incredibly easy because the developer will simply add the plug-ins that facilitate the developer to develop the advanced version of applications.
- The dependencies are terribly restricted within the eclipse platform because the IDE offers the ability by providing easy panel within which user choose the software package and add-ons that required to be in eclipse platform.

D. ADT Plugin

Android Development Tools (ADT) may be a plugin for the Eclipse IDE that's designed to administer you a strong, integrated atmosphere within which to make mechanical man applications. ADT extends the capabilities of Eclipse to allow you to quickly found out new mechanical man comes, produce associate application UI, add packages supported the mechanical man Framework API, rectify your applications victimization the mechanical man SDK tools, and even export signed (or unsigned) apk files so as to distribute your application.

The Android Development Tools (ADT) plugin adds powerful extensions to the Eclipse integrated development setting. It permits you to form and right your humanoid applications easier and quicker.

It provides you access to different humanoid development tools from within the Eclipse IDE. as an example, ADT permits you to access the numerous capabilities of the DDMS tool: take screenshots,

manage port-forwarding, set breakpoints, and look at thread and method info directly from Eclipse.

It provides a replacement Project Wizard, that helps you quickly produce and discovered all of the essential files you'll have for a replacement humanoid application. It automates and simplifies the method of building your humanoid application. It provides Associate in Nursing humanoid code editor that helps you write valid XML for your humanoid manifest and resource files.

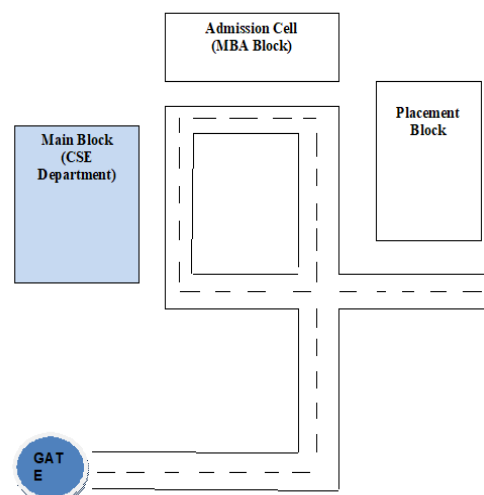
VI. CONCLUSION

The problem and motivation of this paper is that most of the existing navigation system are unable to provide routes accurately as well as further information of the building within a region such as campus, department, hostel and etc without using GPS. Furthermore, the method of by typing words is sometimes inconvenient, an advanced search method by using images can be used to substitute the method of typing words into the search engine. Mobile Campus Navigation Application with Augmented Reality is an application with severely unique functions and properties that delivered in a well user-friendly way to typical users of the system. It apparently gives the user productivity with the combination of technical and user requirements in advance.

OUTPUT

Gate To Main Block (Cse Department):

GATE TO MAIN BLOCK (CSE DEPARTMENT):



Gate to Main Block (CSE Department) – 170m

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Attendance Monitoring Systems for an Organization

1st Mr.Baskaran.M /AP

Dept of Electronics and Communication Engineering.
Sengunthar Engineering College
Namakkal, India
mbaskaran.ece.@scteng.co.in

3rd Ajith.C

Dept of Electronics and Communication Engineering.
Sengunthar Engineering College
Namakkal, India
ajithsakthi1999@gmail.com

2nd Indhuraj.B

Dept of Electronics and Communication Engineering.
Sengunthar Engineering College
Namakkal, India
bindhuraj2001@gmail.com

4th Kaleesbharath.S

Dept of Electronics and Communication Engineering.
Sengunthar Engineering College
Namakkal, India
kaleesbhrath55@gmail.com

Abstract - *Image processing based student attendance System is the easiest way to keep track of attendance for organizations such as Educational Institutions, Business organizations. Among the person identification methods, face recognition is known to be the most natural ones; since the face modality is the modality that uses to identify people in everyday lives. Although other methods, such as fingerprint identification can provide better performance, but they are not appropriate for natural smart interactions due to their intrusive nature. This face detection differentiates faces from non faces and is therefore essential for accurate attendance. Our Proposed strategy involves face recognition for marking the student attendance. Arduino microcontroller is used for face detection and face recognition. The camera will be connected to the Arduino module. The student database is collected. The database includes name of the students with their registered numbers and their face images. Camera will be placed in front of the class in such a way that it can capture the entire class, which is connected to the Arduino. Thus with the help of this system time will be saved and it is so convenient to record the attendance at any time throughout the day.*

Keywords- *Arduino, microcontroller, camera, Image, Face.*

I. INTRODUCTION

Maintenance of student attendance is that the for most tough task in various institutions. Each institutions has its own method of taking human face like biometric methods group action sheet or by some biometric strategies. Mostly student attendance is infatuated with the help of attendance sheet given to the college staffs. This consumes a lot of work and time. We don't know whether the student is responding or not. Calculation of consolidated student attendance is another major task which may cause manual errors. In another cases the human

work sheet might become lost or stolen by some of the students. To overcome such problems we've got a bent to stand measure of another method of attendance management system. There are several biometric strategies offered in which the basic idea is same. One of them told that is the finger print identification is the best concept. During this system the finger prints of the people are collected and hold on within the data of finger print sensor. For this first we've to assemble the finger print of each individual. This is often done only one time or once a replacement entry must be within the knowledge. Then the obtained finger prints are measured and compared with the images that stored in our database. If the two finger prints are same the attendance is marked as present. However this technique has some other disadvantages. They are unbroken properly or if the finger print isn't recognized properly then the act are visiting be marked as absent. There fore this system isn't best. These disadvantages can be overcome with the help of machine-controlled attendance management which does not consumes time and also the data isn't lost till we've got an inclination to erase the data. This technique is best in these day. Our project is going to solve these issues by using face recognition technology. For wireless data transmission and networking between sensor nodes, the project uses IOT modules. The project is supposed straight away on the instance basis with simply few profiles however we'll add even additional once required. Identity verification or face recognition because it's usually spoken as, analyze the characteristics of an individual's face image input through a camera. It measures overall facial structure, distances between eyes, nose, mouth, and jaw edges. These measurements are measured and maintained in an exceedingly information and used as comparison

for a user stands before the camera. One of the strongest positive aspects of face recognition is that it's non-intrusive. Verification or identification are accomplished from 2 feet away or more, while not requiring the user to wait for some time or do something over the camera. Face recognition technique can't be reverse-engineered to recreate personal data and they will not be stolen and to access personal data.

II. OBJECTIVE

Instead of using conventional methods, this proposed program aims to develop an automated system that records the presence of a student using face recognition technology. The main purpose of this project is to make the attendance and management system more efficient, time-saving, simple and easy. Here faces will be detected using face recognition algorithms. The processed image will then be compared to the existing record and the presence will be marked on the website accordingly. Compared with the existing traditional marking system, this system reduces people's workload. The proposed program will be implemented in 4 phases such as photography, group photo classification and face detection, face comparisons and recognition, site review reviews.

III. PROPOSED SYSTEM

A. Face Recognition

A facial recognition system is a computer application capable of identifying an individual from a digital image frame from a image source. one of the ways to try to this can be comparing selected face expression from the image and a face database. It is typically utilized in security systems and might be compared to other biometrics like fingerprint or eye iris recognition systems. Recently, it's also become famous as a commercial identification and marketing tool.

B. Traditional

Some face recognition algorithms identify faces by extracting local symbols, features, image from the title image. for example, the algorithm may analyze the relative shape, size, and / or shape of the eyes, nose, cheekbones, and jaw. These features often require other images with similar characteristics. Some algorithms make the photo gallery more

custom so compress face data, saving only the inside information of the image which is useful for identifying faces. the demand image then compared to the face data. one of the first successful programs was predicted for modeling techniques used in the glowing facial group, which provides a kind of representation of the pressed face. Recognition algorithms are often subdivided into two main methods, geometric, looking at differentiating features, or photometric, which can be a mathematical method that converts an image into numbers and compares values with templates to eliminate variability.

C. 3-Dimensional Recognition

Three-dimensional face recognition technique uses 3D sensors to capture information about the form of a face. This information is then accustomed identify distinctive features on the surface of a face, like the contour of the attention sockets, nose, and chin. One advantage of 3D face recognition is that it's not stricken by changes in lighting like other techniques. It may identify a face from a spread of viewing angles, including a profile view. Three-dimensional data points from a face vastly improve the precision of face recognition. 3D research is enhanced by the event of sophisticated sensors that do a far better job of capturing 3D face imagery. The sensors work by projecting structured light onto the face. Up to a dozen or more of those image sensors is placed on the identical CMOS chip each sensor captures a distinct a part of the spectrum.

D. Skin Texture Analysis

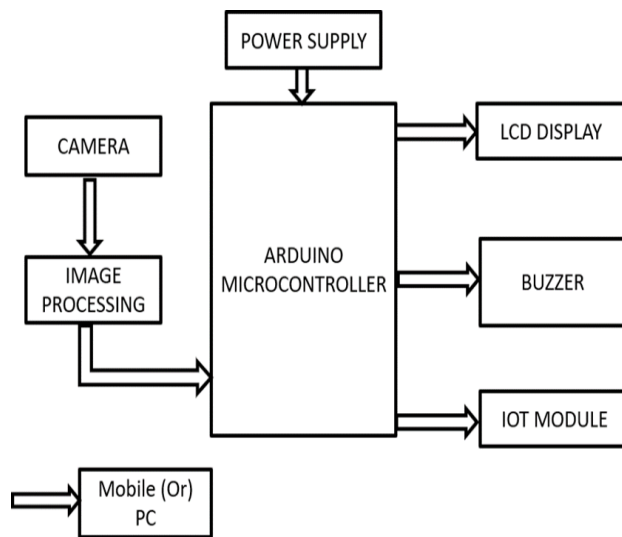
Another emerging trend uses the visual details of the skin, as captured in standard digital or scanned images. this method, called skin texture analysis, turns the unique lines, patterns, and spots apparent during a person's skin into a topological space. Tests have shown that with the addition of skin texture analysis, performance in recognizing faces can increase 20 to 25 percent.

E. Thermal Cameras

A different style of taking a file included for face recognition is the use of web cameras, in which case the cameras will only see the top type and will ignore the topic accessories such as glasses, hats, or makeup. The debate over using hot images for face recognition is that face recognition information sites

limited. Diego Socolinsky, and Andrea Selinger (2004) studied the use of global warming recognition, and workplaces, and at the same time built a brand new website for face photography. The study uses low-aging ferro-electric sensors, which can detect radio wave thermal infrared (LWIR). The results show that the integration of LWIR with conventional visual cameras has major implications for external probes. Indoor results show that visuals include 97.05% accuracy, while LWIR is 93.93%, and Fusion is 98.40%, however externally proves that visuals are 67.06%, LWIR 83.03%, and integration than 89.02%. The study used 240 studies over a 10-week period to create a new database. information was collected on sunny, rainy, and cloudy days.

IV. BLOCK DIAGRAM



V. HARDWARD REQUIREMENTS

A. Power Supply

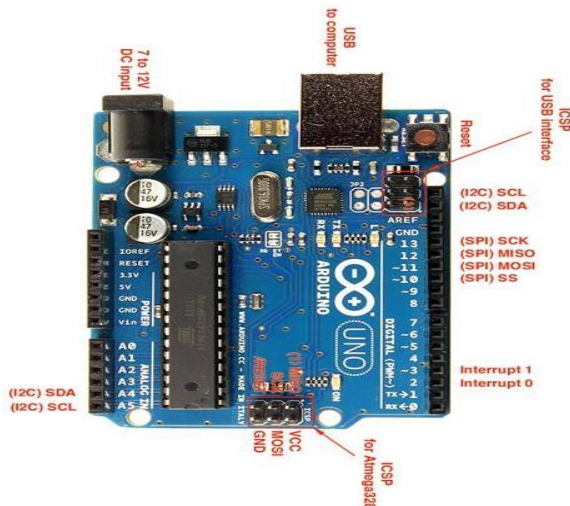
AC-DC adapter (wall-wart) or battery. The adapter may be related with the aid of using plugging a 2.1mm center-fantastic plug into the board's energy jack. Leads from a battery may be inserted withinside the GND and Vin pin headers of the POWER connector. The board can perform on an outside deliver from 6 to twenty volts. If provided with much less than 7V, however, the 5V pin might also additionally deliver much less than 5 volts and the board might also additionally come to be unstable. If the use of extra than 12V, the voltage regulator might also additionally overheat and harm the board. The encouraged variety is 7 to twelve volts. Vin. The enter voltage to the Arduino/Genuino board whilst it

is the use of an outside energy supply (in preference to five volts from the USB connection or different regulated energy supply). You can deliver voltage thru this pin, or, if imparting voltage through the energy jack, get admission to it thru this pin. 5V. This pin outputs a regulated 5V from the regulator at the board. The board may be provided with energy both from the DC energy jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage through the 5V or three.3V pins bypasses the regulator, and might harm your board. We do not endorse it. 3V. A three volt deliver generated with the aid of using the on-board regulator. Maximum present day draw is 50 mA. GND. Ground pins. IOREF. This pin at the Arduino/Genuino board presents the voltage reference with which the microcontroller operates. A well configured protect can study the CH pin voltage and pick the correct energy supply or permit voltage translators at the outputs to paintings with the 5V or 3V.

B. Arduino Microcontroller

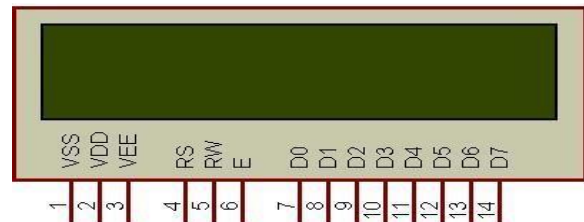
Arduino Uno is a microcontroller board based on ATmega328. It has 14 input / output pixels (six can be used as PWM outputs), six analog inputs, 16 MHz crystal oscillator, USB connection, power supply, ICSP header, and reset button. It contains everything needed to help the little controller; humbly connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. The Arduino Uno is different from all previous boards as it no longer uses the FTDI USB-to-serial motive driver chip. instead, it enables ATmega8U2 configured as a USB-to-serial converter. Arduino Uno Board 2 update has a resistance that pulls the 8U2 HWB line down, making it easy to set up in DFU mode. "Uno" means one in Italian and was selected to mark the release of Arduino software (IDE) 1.0 software. The Uno Board and the 1-1.zero model of the Arduino software (IDE) software were the reference versions of Arduino, now converted to new releases. The Uno Board is the first in a series of USB Arduino boards, as well as the reference version of the Arduino platform; for an in-depth list of current, past or older boards see the Arduino index of the board. This is the Arduino Uno R3. As with all previous board functions, Uno now uses ATmega16U2 by selecting the 8U2 obtained from Uno (or FTDI available from previous generations). This allows for faster transfer costs and greater memory. No drivers wish for Linux

or Mac (home windows file is required and covered inside Arduino IDE), as well as the ability to display Uno like keyboard, mouse and many others. The Uno R3 also adds SDA and SCL pins near AREF. in addition, there are new pins near the RESET pin. Another IOREF that allows the shields to match the electricity supplied to the board. some are no longer connected and are set for future purposes. The Uno R3 works with all existing shields but is able to adapt to new shields that use these additional pin. Arduino Uno is a microcontroller board based entirely on ATmega328. Arduino is an open source , prototyping and its simplicity makes it ready for people who love to use it more than professionals. Arduino Uno has 14 digital input / output pins (6 of which can be used as PWM output), 6 analog inputs, 16 MHz crystal oscillator, USB connection, power jack, header of ICSP, and reset button. Contains all the lots needed to help the microcontroller; explicitly connect to a portable computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. Liquid crystal display is used to show the results of machine operation including reasonable values, vehicle image and more.... A liquid-crystal display (lcd) is a flat panel display, a digital visual display, or a video display using simple modular housing of liquid crystals. Liquid crystals no longer give off direct cooling. The liquid level display costs three deceptive lines and 8 I / O types of reality bus. The most widely used character based LCDs are based on Hitachi HD44780 controller or alternatively well-suited HD44580. In this tutorial, we are able to talk about human-based LCDs, their interactions with various microcontrollers, multitasking (8-bit / 4-bit), editing, special features and tips on these easy-to-use LCDs that can give a new look to use.



C. Liquid Crystal Display

Liquid Crystal Display is used to display machine performance results that include reasonable values, vehicle image and more.... A liquid-crystal display (lcd) is a flat panel display, a digital visual display using simple modular housing of liquid crystals. Liquid crystals no longer give off direct mild. The liquid level display costs three deceptive lines and 8 I / O types of reality bus. The most widely used character based LCDs are based on Hitachi HD44780 controller or alternatively well-suited HD44580. In this tutorial, we are able to talk about human-based LCDs, their interactions with various microcontrollers, multi-touch (8-bit / 4-bit), editing, special features and tips on these easy-to-use LCDs that can give a new look to your use.

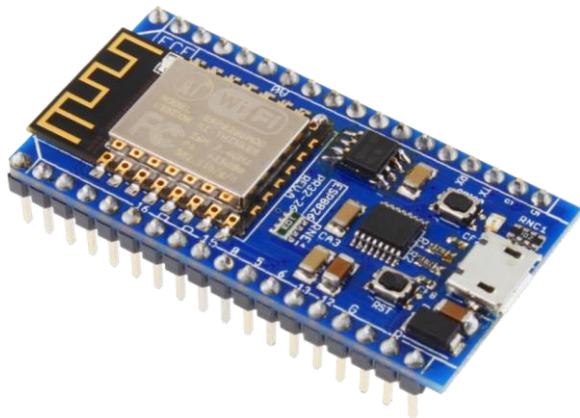


D. Internet of Things

The Internet of things (IoT) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to connect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to inter-operate within the existing Internet infrastructure. Experts estimate that the IoT will consist of about 30 billion objects by 2020. It is also estimated that the global market value of IoT will reach \$7.1 trillion by 2020. The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber- physical systems, which also encompasses

technologies such as smart grids, virtual power plants, smart homes, intelligent transportation and smart cities. Things in the IoT sense, can refer to a wide variety of devices such as heart monitoring implants, biochip transponders on farm animals, cameras streaming live feeds of wild animals in coastal waters, automobiles with built-in sensors, DNA analysis devices for environmental/food/pathogen monitoring, or field operation devices that assist fire fighters in search and rescue operations. Legal scholars suggest regarding "things" as an "inextricable mixture of hardware, software, data and service".

The applications for internet connected devices are extensive. Multiple categorizations have been suggested, most of which agree on a separation between consumer, enterprise (business), and infrastructure applications. George Osborne, the former British Chancellor of the Exchequer, posited that the Internet of things is the next stage of the information revolution and referenced the inter-connectivity of everything from urban transport to medical devices to household appliances.



The ability to network embedded devices with limited CPU, memory and power resources means that IoT finds applications in nearly every field. Such systems could be in charge of collecting information in settings ranging from natural ecosystems to buildings and factories, thereby finding applications in fields of environmental sensing and urban planning. Intelligent shopping systems, for example, could monitor specific users' purchasing habits in a store by tracking their specific mobile phones. These users could then be provided with

special offers on their favorite products, or even location of items that they need, which their fridge has automatically conveyed to the phone. Additional examples of sensing and actuating are reflected in applications that deal with heat, water, electricity and energy management, as well as cruise-assisting transportation systems. Other applications that the Internet of things can provide is enabling extended home security features and home automation. The concept of an "Internet of living things" has been proposed to describe networks of biological sensors that could use cloud-based analyses to allow users to study DNA or other molecules.

Network control and management of manufacturing equipment, asset and situation management, or manufacturing process control bring the IoT within the realm of industrial applications and smart manufacturing as well. The IoT intelligent systems enable rapid manufacturing of new products, dynamic response to product demands, and real-time optimization of manufacturing production and supply chain networks, by networking machinery, sensors and control systems together.

E. Buzzer

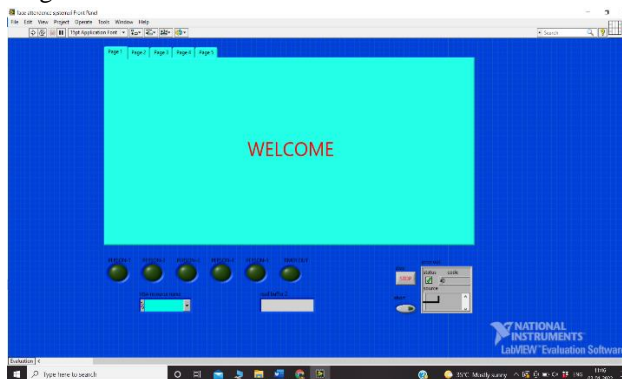
It's simple, `tone(buzzer, 1000)` sends a 1KHz sound signal to pin 9, `delay(1000)` pause the program for one second and `noTone(buzzer)` stops the signal sound. The `loop()` routine will make this run again and again making a short beeping sound. (you can also use `tone(pin, frequency, duration)` function) Play with the project now by changing the code. For example, try to change sound signal "1000" (1KHz) to "500" (500Hz) or delay time and see how it changes the program.



VI. SOFTWARE REQUIREMENTS

A. Lab VIEW

LabVIEW (short for Laboratory Virtual Instrument Engineering Workbench) is a system-design platform and development environment for a visual programming language from National Instruments. The graphical language is named "G" (not to be confused with G-code). Originally released for the Apple Macintosh in 1986, LabVIEW is commonly used for data acquisition, instrument control, and industrial automation on a variety of platforms including Microsoft Windows, various versions of UNIX, Linux, and OS X. The latest version of LabVIEW is LabVIEW 2015, released in August 2015.



Final Output Screen in LabVIEW

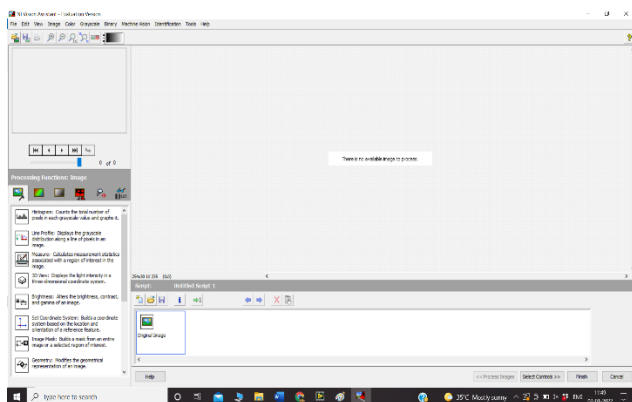
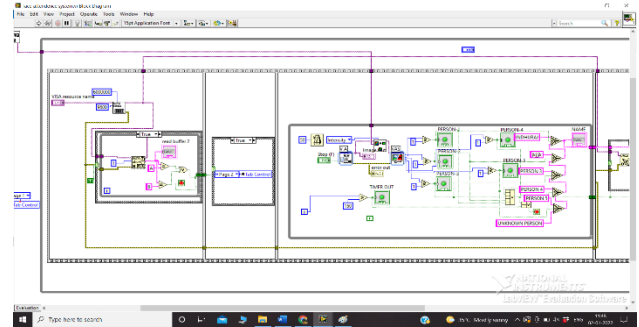


Image processing in LabVIEW Software



Block Diagram of Image Processing

Dataflow Programming

The programming language used in LabVIEW, also referred to as G, is a dataflow programming language. Execution is determined by the structure of a graphical block diagram (the LabVIEW-source code) on which the programmer connects different function-nodes by drawing wires. These wires propagate variables and any node can execute as soon as all its input data become available. Since this might be the case for multiple nodes simultaneously, G is inherently capable of parallel execution. Multi-processing and multi-threading hardware is automatically exploited by the built-in scheduler, which multiplexes multiple OS threads over thenodes ready for execution.

Graphical Programming

LabVIEW ties the creation of user interfaces (called front panels) into the development cycle. LabVIEW programs/subroutines are called virtual instruments (VIs). Each VI has three components: a block diagram, a front panel and a connectorpanel. The last is used to represent the VI in the block diagrams of other, calling VIs. The front panel is built using controls and indicators. Controls are inputs – they allow a user to supply information to the VI. Indicators are outputs – they indicate, or display, the results based on the inputs given to the VI. The back panel, which is a block diagram, contains the graphical source code. All of the objects placed on the front panel will appear on the back panel as terminals. The back panel also contains structures and functions which perform operations on controls and supply data to indicators. The structures and functions are found on the Functions palette and can be placed on the back

panel. Collectively controls, indicators, structures and functions will be referred to as nodes. Nodes are connected to one another using wires – e.g. two controls and an indicator can be wired to the addition function so that the indicator displays the sum of the two controls.

B. MQTT Client

Welcome to the third edition of MQTT Essentials - a ten-part blog series on the core features and concepts of the MQTT protocol. In this post, we will discuss the roles of the MQTT client and broker, the parameters and options that are available when you connect to a MQTT broker, and explain MQTT server and connection establishment. At the end of this blog post, we have a video that complements this blog post. We recommend you to read the blog post and watch the video for further information. HiveMQ is now open source. HiveMQ Community Edition implements the MQTT broker specification and is compatible with MQTT 3.1, 3.1.1 and MQTT 5. HiveMQ MQTT Client is a Java-based MQTT client implementation compatible with MQTT 3.1.1 and MQTT 5. Both projects are available under the Apache open source license on GitHub. MQTT uses the topic (subject) of the message to determine which message goes to which client (subscriber). A topic is a hierarchically-structured string that can be used to filter and route messages (more details). Our last post gave you a high-level view of the publish/subscribe model and how it differs from a traditional message queue. This post takes a practical approach and is stuffed with basic knowledge about MQTT: definitions for the terms MQTT client and broker, the basics of an MQTT connection, the Connect message with its parameters, and establishing a connection through the acknowledgement of the broker.

VII. TOOLS IMPLEMENTATION

ARDUINO IDE

IDE stands for “Integrated Development Environment” :it is an official software introduced by Arduino.cc, that is mainly used for editing, compiling and uploading the code in the Arduino Device. Almost all Arduino modules are compatible with this software that is an open source and is readily available to install and start compiling the code on the go. In this article, we will introduce the

Software, how we can install it, and make it ready for developing applications using Arduino modules. Arduino IDE is an open source software that is mainly used for writing and compiling the code into the Arduino Module. It is an official Arduino software, making code compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process. It is easily available for operating systems like MAC, Windows, Linux and runs on the Java Platform that comes with inbuilt functions and commands that play a vital role for debugging, editing and compiling the code in the environment. A range of Arduino modules available including Arduino Uno, Arduino Mega, Arduino Leonardo, Arduino Micro and many more. Each of them contains a microcontroller on the board that is actually programmed and accepts the information in the form of code. The main code, also known as a sketch, created on the IDE platform will ultimately generate a Hex File which is then transferred and uploaded in the controller on the board. The IDE environment mainly contains two basic parts: Editor and Compiler where former is used for writing the required code and later is used for compiling and uploading the code into the given Arduino Module.

VII. CONCLUSION

Face recognition based attendance system has been visualized for the aim of reducing the errors that occur inside the normal (manual) attendance taking system. The aim is to form a system that's helpful to the organization like an educational institute. The economical and correct technique of attendance systems within the institution which will replace the previous manual strategies. This technique is secure enough, reliable and obtainable to be used for attendance monitoring system. No need for specialized hardware for putting in the system for an educational institute.

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VLSI Technology for Future Automotive and Mobility System

Dr. C. Aarthi ¹, Mutharasu Beemarajan ²

^{1,2}*Department of Electronics and Communications Engineering, Sengunthar Engineering College, (India)*

ABSTRACT

Since the first introduction of microprocessors in automobiles in the 1970's, the world has witnessed their dramatic growth as well as their contribution to all aspects of vehicle performance. As the global demand for personal mobility continues to grow, the automotive industry needs to accelerate the development of solutions to social issues such as environment, energy security, traffic accidents, and urban traffic congestion.

To address these issues, Most of the OEMs seek out the ultimate goal of "Zero Emission" and "Zero Fatalities" through vehicle electrification and vehicle intelligence. The electric vehicle is a symbol of electrification, where components are fully electrically-powered and controlled. Autonomous driving technologies, such as advanced sensing, dynamic driving context interpretation, vehicle maneuver planning and controls, exemplify vehicle intelligence.

This paper provides an overview of the contribution of VLSI (Very Large Scale Integration) to enhancing vehicle electrification and vehicle intelligence, as well as the perspectives for future mobility systems.

I. INTRODUCTION

Since the first introduction of microcontroller units (MCU) into automobile engine control, the performance of engines has significantly evolved in terms of power, fuel efficiency and emissions.

In addition to engine controls, electronics have seen a wave of expanded functions. Today, the number of electrical control units (ECU) in automobiles has increased to over fifty, Thus reaching ~40% of Total Car Cost as shown in Fig. 1

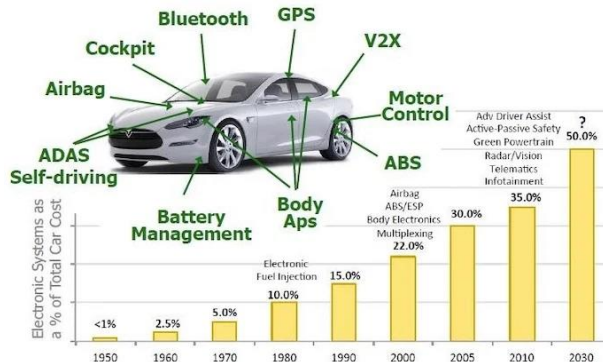


Fig. 1. Evolution of ECUs and their Cost share

One hundred and ten years has passed since the advent of mass-production of automobiles. Current annual production volumes already exceed eighty million, and automotive markets are expected to grow even further. However, with the progress of motorization, automotive systems face serious social issues, such as energy security, global warming, urban congestion, and traffic accidents. Fig. 2 shows the increasing trend in energy consumption [1].

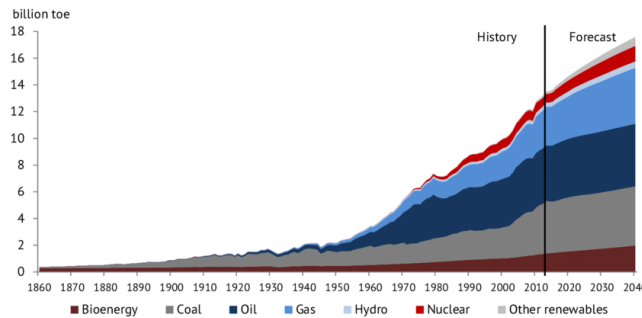


Fig. 2. Energy Consumption Scenario

Energy consumption has tripled in thirty years, yet most sources of energy are still based on fossil fuels. According to IPCC (Intergovernmental Panel on Climate Change), global mean surface temperature has increased about 1 degree Celsius since pre-industrial times caused by anthropogenic greenhouse gas (GHG) emissions [2]. Fig. 3 shows the trend in global average temperature since 1894. As for urban congestion, we estimate that the resulting global financial loss has reached over 500 billion dollars. Lastly, the World Health Organization (WHO) reported that there were 1.35 million road traffic deaths globally in 2018 [3].

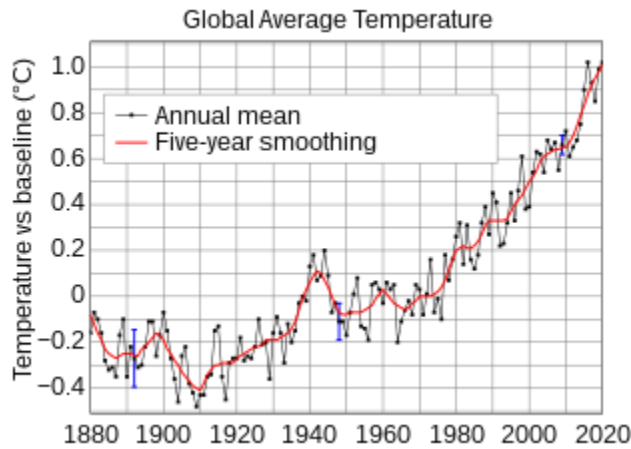


Fig. 3 Global Average Temperature [2]

Every Automotive OEM and it’s System Supplier believes that the key to solving these issues is “Vehicle Electrification” and “Vehicle Intelligence”.

II. VEHICLE ELECTRIFICATION

Vehicle electrification has potential to accelerate the reduction of CO2 by leveraging energy efficiency (Fig. 4). In addition, electrification encompasses a diverse array of energy sources, for example, electricity and hydrogen generated from fossil fuels, solar, wind, nuclear, and biomass. On the other hand, conventional internal combustion engine vehicles (ICEV) and hybrid vehicles (HV) are only able to use oil as an energy source (Fig. 5). To reduce CO2 levels, we need to reduce the use of fossil fuels.

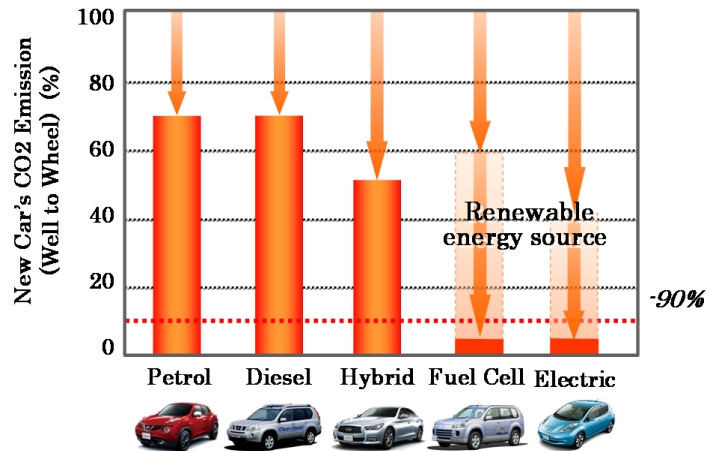


Fig. 4. Opportunities to reduce CO2 emissions

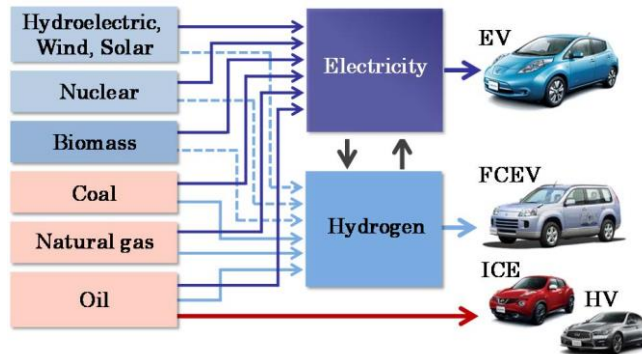


Fig. 5. Energy source diversity by vehicle type

Therefore, the new Automotive Powertrain strategy emphasizes the conversion from fossil fuels to renewable energy sources. An embodiment of this mindset, Most of the Global OEMs released all-electric vehicles (EV) and some of the Globally best-selling EVs in 2021 are provided for reference [4]. The key devices of electrification are the inverter and battery controller, which will be the key components in the new frontier of LSI (Table 1) as represented in (Fig. 6) EV System.

Table 1. Key devices of electrification

| Key Device | Function |
|--------------------|---|
| Inverter | <ul style="list-style-type: none"> • Output Control • Regeneration Control |
| Battery Controller | <ul style="list-style-type: none"> • Status Monitoring • Protection • Failsafe |

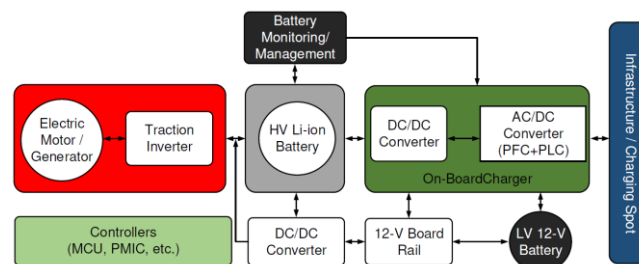


Fig. 6 Blocks within an EV System [5]

The Key components, in an EV system that requires miniaturisation, higher efficiency, lower power dissipation and cost reduction through VLSI are

1. Power Management IC (PMIC)
2. Microcontroller (MCU)
3. High Power IGBTs or SiC MOSFETs
4. Sensing & Monitoring blocks
5. Various Protection & Isolation circuits

The Simplified Block diagram of this whole system is represented in Fig. 7. The switches are controlled via the MCU and isolated gate drivers for the high side (HS) and low side (LS) of the inverter leg. The PWM signals are commonly generated using the space vector modulation (SVM) scheme. As the motor operates, the voltage, current and position signals are sensed and fed back to the controller to modify the modulation of the inverter. One such feedback method is field oriented control (FOC).

A good modulation scheme, fast feedback and accurately sensed signals are required for efficient motoring [5].

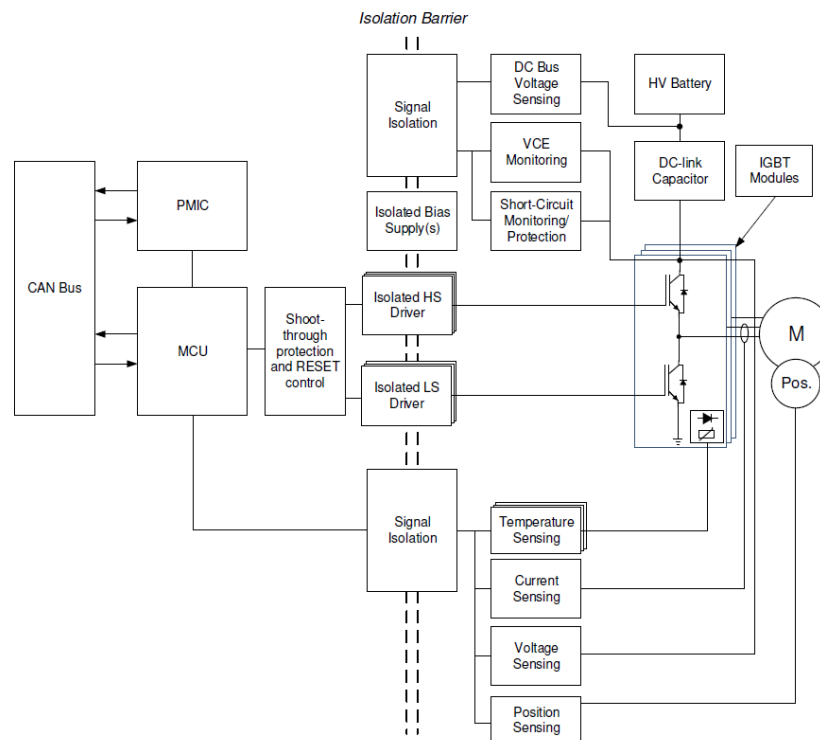


Fig. 7 EV Inverter Block Diagram [5]

III. VEHICLE INTELLIGENCE

Reports show that more than 90% of traffic accidents are caused by the driver [6]. To aid the driver and reduce human error, more than 20 years ago, OEMs started development of the “Safety Shield” concept whereby the vehicle leverages various barriers, from normal driving to post-accident, to provide continuous support against dangerous situations. The result of these efforts includes some groundbreaking technologies, such as (Fig. 8)

1. Around View Monitor
2. Lane Departure Prevention
3. Back-up Collision Intervention
4. Forward Emergency Braking
5. Blind spot detection etc.,

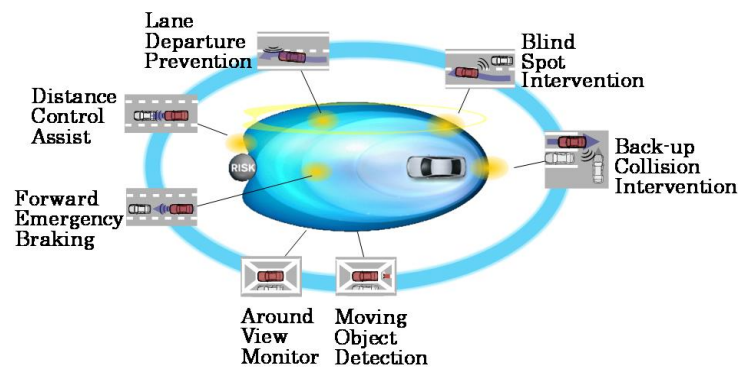


Fig. 8. All-around SAFETY SHIELD technologies

To further improve safety, OEMs are progressively launching even more autonomous driving technologies to enable safe autonomous driving in a single lane on congested highways in the coming years. This will include risk-avoidance and lane-changing functions, which facilitate driving on multiple-lane roads.

For autonomous driving, the core technology functions to support or replace the driver’s actions include sensing, cognition, decision, and actuation by on-board systems. Fig. 9 shows the on-board cameras, sensors and actuators required for autonomous driving.

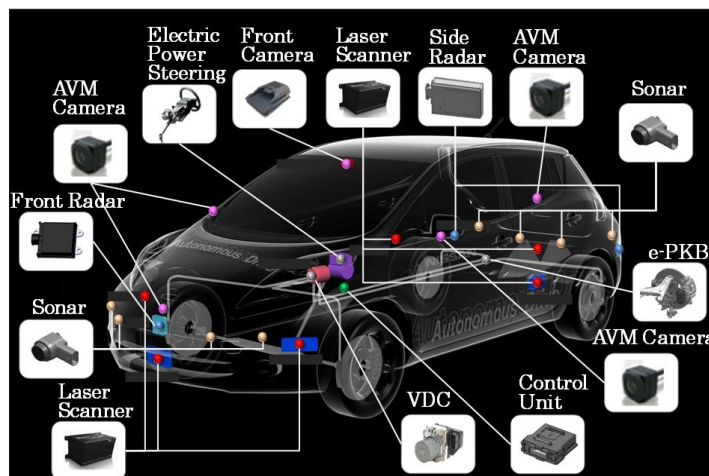


Fig. 9. Key devices for autonomous driving

Needless to say, a “brain,” mapping out a driving plan, is needed for processing the information from various sensors, predicting the behavior of surrounding traffic, and deciding the next actions.

In addition to these four core functions, an evolution of supporting technologies, such as human machine interface (HMI), map, connectivity and E/E architecture, is necessary. Positioning accuracy required for driving in urban areas is reported to be about 20 to 30 cm. Therefore, navigation maps must be so precise that they are on a three-dimensional level.

Additionally, to support unexpected situations that may arise during autonomous driving, dynamic information, such as weather and traffic conditions, should be reflected in real time.

Furthermore, over-the-air (OTA) updates would be necessary to immediately address changes in the environment such as traffic regulations. Because of the connection with the outside network, the on-board electrical/electronic architecture (E/E architecture) must have a security system. Lastly, a further explanation of the details of human machine interface (HMI) is needed. Autonomous driving systems would not completely replace the driver. The driver must still take full driving responsibility. This is why HMI is imperative for autonomous driving. The system should be designed such that it requires relatively little eye movement and the driver is fully aware of the vehicle’s behavior at all times.

Full-TFT meter consoles with 3D graphics and heads-up display (HUD) systems, exhibiting higher CPU and GPU performance than conventional displays/cockpits (Table 2) are required to realize full communication between the driver and the vehicle.

Table 2. Requirements for HMI

| Description | Present Vehicles | Autonomous Vehicles |
|--------------|------------------------------|--------------------------|
| Cockpit type | Analog/Digital meter display | Full TFT cockpit display |
| CPU | 100 MHz | 2 GHz |
| Memory | 4 MB | 4 GB |
| GPU | No 3D graphics | 3D graphics |

IV. INTELLIGENT MOBILITY

In addition to vehicle electrification and vehicle intelligence, OEMs believe that connectivity between vehicles and social infrastructures will be imperative.

One example of the connectivity with social infrastructures is shown in Fig. 10. Today, in the Hawaiian island of Maui, the supply of electricity by wind power exceeds demand during nighttime and early morning hours.

In order to solve the mismatch between supply and demand, several hundred Nissan LEAFs are participating in test studies to charge on-board batteries when supply exceeds demand and discharge to the grid during peak demand hours [7]. In addition, Hawaii and the U.S. The Department of Energy reaffirmed their commitment to the clean energy initiative in 2014, which leads the way in eliminating the dependence on oil by setting the goal of achieving 100% renewable energy by 2045 [7]. This surplus in electricity should continue to vastly grow, therefore we estimate that it is possible to shift the supply-demand peak using 16,000 Nissan LEAFs, which is equivalent to one-third of all passenger vehicles in Maui.

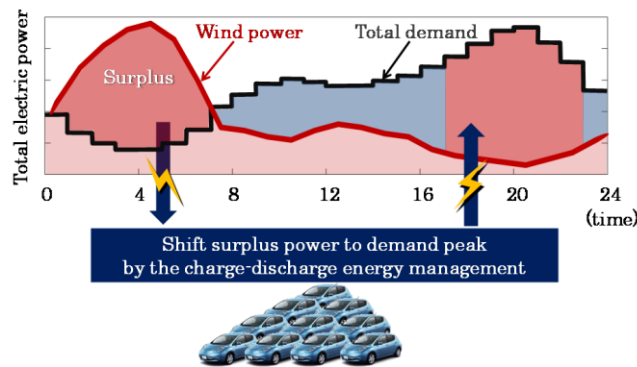


Fig. 10. Trend of supply and demand of electricity in the Hawaiian island of Maui

Another example of the link with social infrastructure is traffic control. Traffic congestion is often the result of a chain of events caused by reduced speeds from variations in the grade of the highway. As vehicles are forced to get closer together, abrupt speed changes cause shock waves to form in the traffic stream, rippling backward and causing even more vehicles to slow down.

An effective way to avoid this type of traffic congestion would be to control the speed of each vehicle as well as the distance between them using a “*vehicle to infrastructure*” (V2I) system (Fig. 11).

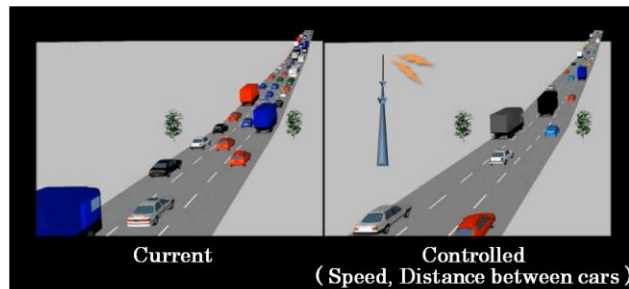


Fig. 11. Simulation of traffic on the Tomei Expressway in Yamato city, Japan

V. SUMMARY

This paper provides an overview of intelligent mobility realized by vehicle electrification and vehicle intelligence. In addition, it suggests new application opportunities for VLSI, such as electric powertrain, battery, sensors, camera, AI and connected vehicle management systems. LSIs must be optimized to vehicle application in response to growing automotive demand.

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Online Monitoring For On-Board Diagnostics Parameter (Software Module)

Mr. Arunkumar.M¹, Dr. Venkatesh.C², Manju.S³, Prema.K⁴, Yuvasri.R⁵

¹Assistant Professor, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA)

²Professor, Department of ECE, Builders Engineering College, Kangeyam, (INDIA)

^{3,4,5} Student, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA)

1. ABSTRACT

OBD (On Board Diagnostics) is one of critical tool used for the emission control in today's automobiles. OBD generates fault codes when any system/component non-compliance is detected. Commercially available tools fetch fault codes from OBD and are providing only limited information/access of basic data to engineers. These tools are black box type of tools which provide very limited flexibility. Also the data storage capacity of these diagnostic tools is very limited. This paper informs about new indigenously developed OBD scanning tool which provides complete access to engineers, good flexibility and large storage capacity with added features like time and cost saving.

Keywords: *Automobiles, Emission control, Good flexibility, Large storage capacity, OBD scanner*

2. INTRODUCTION

Computer programs and embedded systems have been part of the cars from long time. Most of the car owners are not aware the price of the second-hand car is decided based on the information available on these computers using wired and wireless technology for car users has become very easy. This information available in cars can be seen by the owner with the help of their smartphone and cloud technologies. As per the recent changes in the automobile industry paradigm, automobiles are mandatory to develop on eco-friendliness, safety etc...As many additional services and safe and convenient automatic internal control system have been introduced to provide more comfort and safety of the customers. The benefits of OBD are encourages design of durable and robust emission control systems and helps keep emissions low by identifying emission controls in need of repairs. The most one of the OBD is works for life of the vehicle.

3. METHODOLOGES

3.1 ON-BOARD DIAGNOSTIC (OBD)

On Board Diagnostic is a comprehensive electronic system, which detects exhaust emission related failures in passenger vehicles, light duty trucks and heavy duty vehicles, which run on combustion engines. These types of engines produce toxic exhaust emissions like HC, CO, and soot. The amount of these emissions is regulated by law in many countries (see emissions regulation map). To fulfill these legal requirements, complex exhaust emission control and cleaning systems are installed by OEMs. These systems and the related components have

to be monitored by a so called On Board Diagnostic system. The OBD laws require that all components and subsystems which have an emission impact and which are connected to an Engine Control Unit (ECU) need to be monitored and diagnosed. The components can be divided into:

Sensors: O2 sensor, temperature sensors, pressure sensors, etc.

Actuators: Fuel injectors, ignition coils, throttle blades, EGR valve, etc.

On the system side, several subsystems have to be monitored such as a malfunction of a complete subsystem which leads to a certain emission increase. Such subsystems are:

- ✓ Fuel Injection System
- ✓ Ignition system
- ✓ Exhaust gas cleaning system

The law requires only diagnostics on components which lead to an increase of exhaust emissions. However, failures of components which lead to a degradation of the OBD diagnostic system have also to be detected.

3.2 AZURE IOT CLOUD

IoT Hub is a managed service hosted in the cloud that acts as a central message hub for communication between an IoT application and its attached devices. You can connect millions of devices and their backend solutions reliably and securely. Almost any device can be connected to an IoT Hub.

3.3 MQTT INTEGRATE

MQTT is a publish/subscribe protocol that allows edge-of-network devices to publish to a broker. Clients connect to this broker, which then mediates communication between the two devices. When another client publishes a message on a subscribed topic, the broker forwards the message to any client that has subscribed.



4. SOFTWARE DESIGN

4.1 ANGULAR

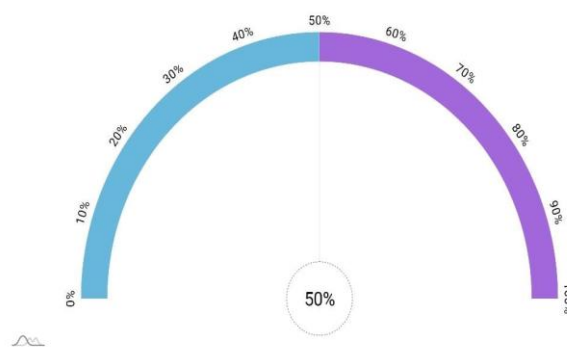
Angular is an application design framework and development platform for creating efficient and sophisticated single-page apps. Angular is a development platform, built on TypeScript. As a platform, Angular includes:

- ✓ A component-based framework for building scalable web applications.
- ✓ A collection of well-integrated libraries that cover a wide variety of features, including routing, forms management, client-server communication, and more.
- ✓ A suite of developer tools to help you develop, build, test, and update your code.



4.2 AM CHARTS

AM charts is an open-source tool, build on top of our JavaScript Maps and JavaScript Charts products.



Animated gauge

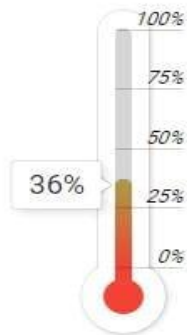


Vehicle Speed



30%

Battery

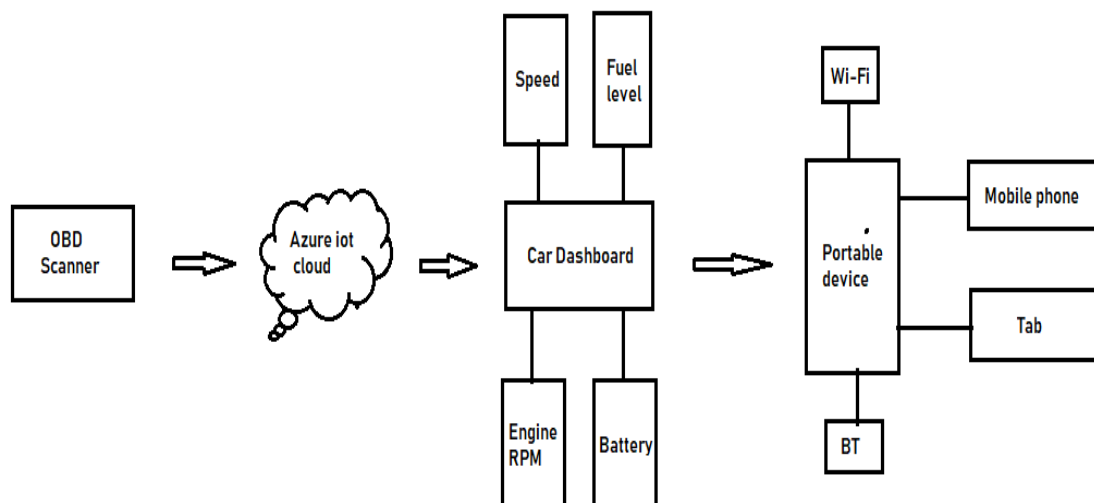


Thermometer



Engine RPM

5. BLOCK DIAGRAM



Block diagram of the On-Board Diagnostics

6. CONCLUSION

The OBD port still remains important to vehicle health, safety and sustainability. Although the number and variety of connected devices for vehicles increases, not all devices report and track the same information.



Vehicle's diagnostic get much attention from industry and researchers in recent years. The variety and heterogeneity of vehicle diagnostics implementation has been the major reason which makes it interested. This paper presents a technique to analyse diagnostics from vehicle that connected to OBD and process the diagnostics data using Raspberry Pi. People can also send a command to their own vehicle by using this application. Although the process occurs only the delivery of vehicle diagnostic data to user's smartphone, Raspberry Pi is more suitable viewing the ability of Raspberry Pi that can be multitasking. In the future research that related to OBD scanner, its recommended to use OBD scanner with Bluetooth rather than Wi-Fi, because it's more energy saving, easier to use and more stable.

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ONLINE MONITORING OF OBD PARAMETERS (HARDWARE MODULE)

Madhumitha.V¹ Priya.V² Sneka.K³ Arunkumar.M⁴ .Dr.Venkatesh.C⁵

^{1,2,3} Student, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA) ⁴Professor, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA) ⁵Professor, Department of ECE, Builders Engineering College, Kangeyam, (INDIA)

ABSTRACT

Our project presents the design and development of On-Board Diagnostic (OBD) device for cars and its working was based on OBD-II standards defined by SAE. Our device shows the real-time status of vehicle's systems and sub-systems including engine speed rpm, coolant temperature, pressure etc, and Diagnostic Trouble Codes (DTCs).The software used in this system has been primitively developed which shows the faults in the system. This device helps the user to understand real-time status of vehicle as well as it makes easier to check the malfunctioning in vehicles systems and subsystems by displaying Diagnostic Trouble Codes DTCs

Key Words: automotive, connected cars, parameters, cloud

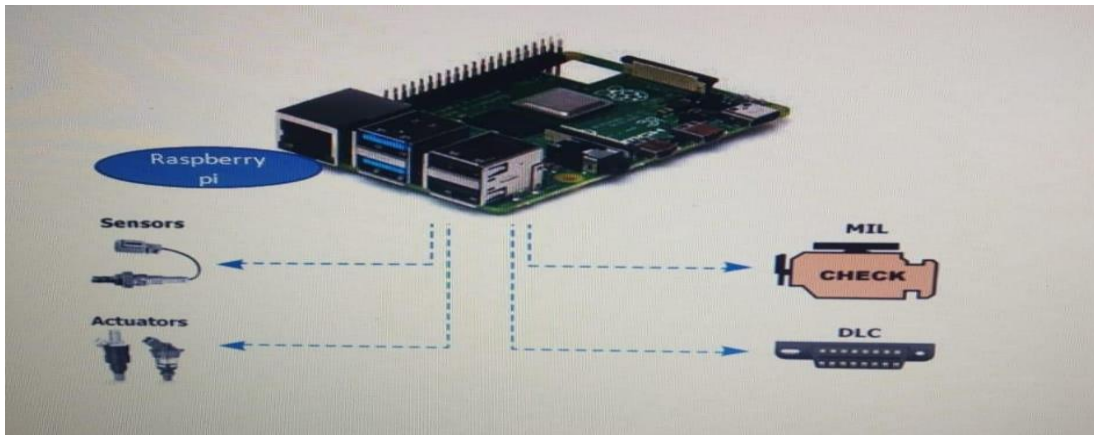
1. INTRODUCTION

OBD stands for On-Board Diagnostics.OBD is a computer based system designed to reduce emissions by evaluating the performance of major engine components. The system also monitors the performance of the ignition system and transmission operation. It generally functions by placing different kinds of sensors in vital areas of the vehicle. The system reports back to the diagnostic system whether those specific areas are working perfectly .On-Board Diagnostics is a computer system inside the vehicle that tracks and regulates the performance. The computer system collects information from the network of sensors inside the vehicle, which the system can then use to regulate or alert the user about the performance of the vehicle.

2. METHODOLOGIES

RASPBERRY PI

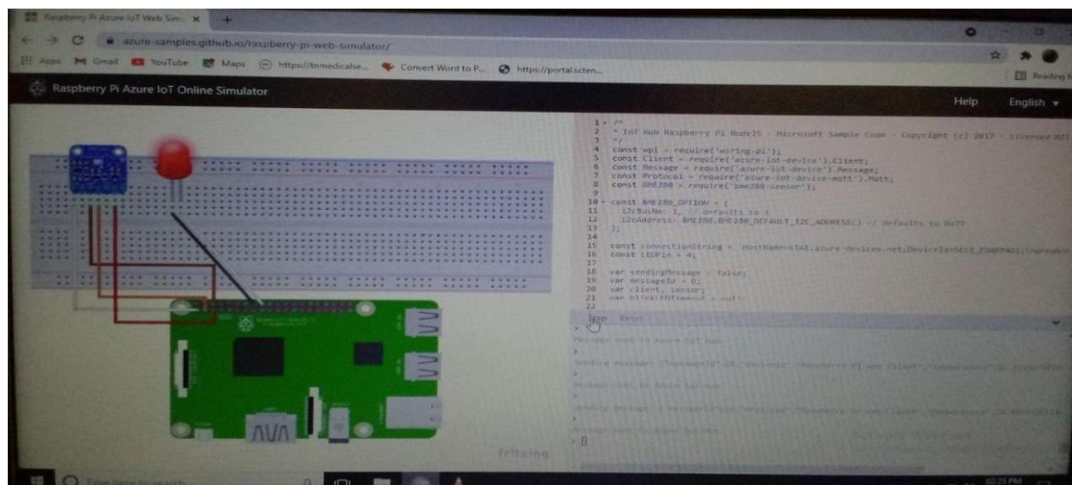
Sometimes you need to access a Raspberry Pi without connecting it to a monitor Perhaps the Pi is embedded in something like a robot, or you may want to view some information from it from elsewhere. Or perhaps you simply don't have a spare monitor! You can connect to your Raspberry Pi from another machine. But in order to do so you'll need to know its IP Address. Any device connected to a Local Area Network is assigned an IP address. In order to connect to your Raspberry Pi from another machine using SSH or VNC, you need to know the Pi's IP address. This is easy if you have a display connected, and there are a number of methods for finding it remotely from another machine on the network.



A system in the engine's on-board computer that monitors the performance of almost every emission-related component for malfunctions. When a malfunction is detected, information about the malfunctioning component is stored. Technicians can download the information with a "scan tool" to help fix vehicle. A basic OBD system consists of a Raspberry Pi, which uses input from various sensors (e.g., oxygen sensors) to control the actuators to get the desired performance. The "Check Engine" light, also known as the MIL (Malfunction Indicator Light), provides an early warning of malfunctions to the vehicle owner. A modern vehicle can support hundreds of parameters, which can be accessed via the DLC (Diagnostic Link Connector) using a device called a scan tool. A mechanic who wanted to access diagnostic information typically had to buy a tool for every different vehicle make. OBD-I scan tools that support multiple protocols are supplied with an array of different adapter cables. It is a computer-based system originally designed to reduce emissions by monitoring the performance of major engine components.

RASPBERRT PISIMULATOR

Raspberry Pi simulator that allows users to write code to control emulated hardware, and that currently lets users interact with an LED and collect data from a sensor. The simulator shows a graphic of a Pi wired to a combined humidity, temperature, pressure sensor and a red LED via a breadboard, a plug board that allows circuits to be wired together rapidly. Users can type in a side panel to enter Node.js JavaScript code, which can be used to control the LED and collect dummy data from the simulated sensor. That code can be executed using a command line at the base of the panel



PYTHON: Python is a powerful programming language that's easy to use easy to read and write and, with Raspberry Pi, lets you connect your project to the real world. Python syntax is clean, with an emphasis on readability, and uses Standard English keywords.

3. ON-BOARD DIAGNOSTICS

OB stands for On-Board Diagnostics.OBD is a computer based system designed to reduce emissions by evaluating the performance of major engine components. Implementation began in 1994and Full Implementation achieved in 1996 Over 150 million ,OB II-equipped vehicles operating in the United States today.Vehicle Applications (< 14,000 pounds) Passenger cars, Light-duty trucks, Medium-duty vehicles and engines. OBD requirements adopted for heavy-duty vehicles in 2005 (HD OBD, > 14,000 pounds) and Full implementation in 2013. On Board Diagnostic is a comprehensive electronic system, which detects exhaust emission related failures in passenger vehicles, light duty trucks and heavy duty vehicles, which run on combustion engines. A system in the engine's on-board computer that monitors the performance of almost every emission-related components for malfunctions Uses information from sensors to judge performance of emission controls o Sensors do not directly measure emissions Mostly software that runs diagnostics in the background.

OBD PARAMETERS (Monitor)

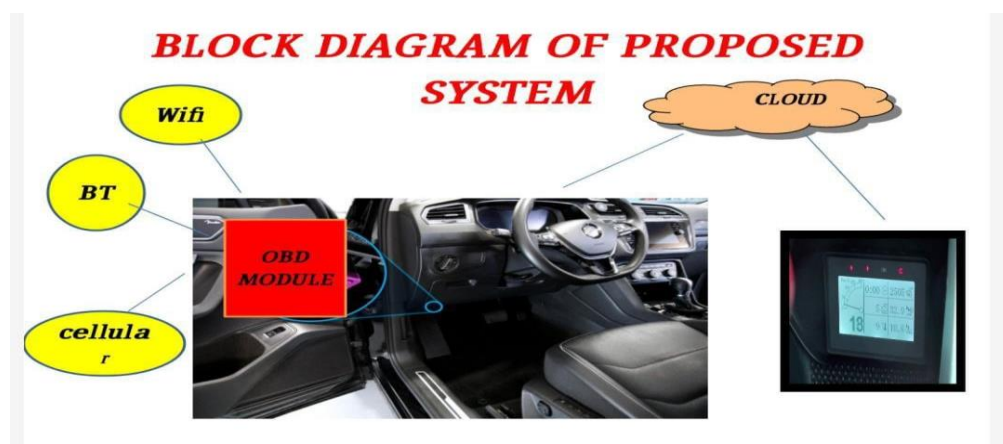
- Battery Level
- Fuel Level
- Tyre pressure
- Coolant temperature
- Oil level
- Engine Speed
- Engine rpm
- Brake system
- Emergency assistance

ALGORITHM / TECHNIQUES / TOOLS USED

On Board Diagnostic using algorithm Tools are used:

- OBD Scanner
- Portable devices
- Remote system
- OBD Module

BLOCK DIAGRAM



BASIC OBD PROCEDURE

- System waits for right monitoring conditions
- Observes Signals Entering the Computer
- Directly from the component/system, or
- Related to performance of component/system
- Verifies Performance /Functionality / Rationality
- Malfunction criteria
- Notifies Driver of Fault
- MIL illumination
- Unique fault code storage
- Freeze frame information

BENEFITS OF OBD

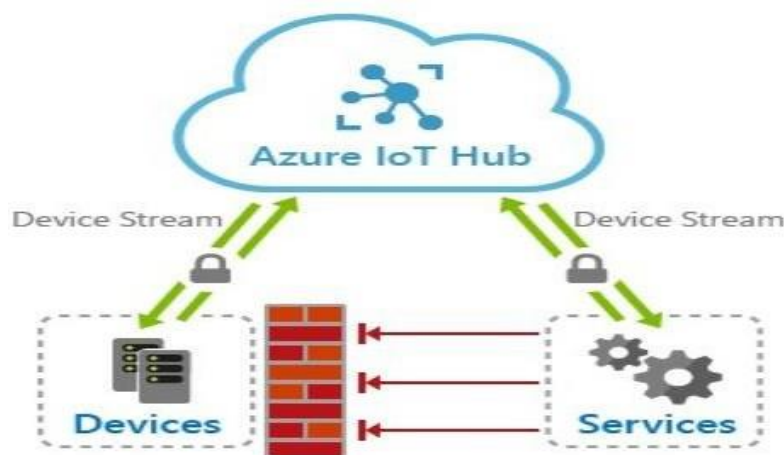
- Encourages design of durable and robust emission control systems
- Helps keep emissions low by identifying emission controls in need of repair
- Provides for effective/inexpensive emission inspections
- Works for life of the vehicle

4. AZUREIOT CLOUD

Azure IoT Hub is Microsoft's Internet of Things connector to the cloud. It's a fully managed cloud service that enables reliable and secure bi-directional communications between millions of IoT devices and a solution back end. ...

Cloud-to-device messages let you send commands and notifications to your connected devices.

Azure IoT Hub provides a cloud-hosted solution back end to connect virtually any device. Extend your solution from the cloud to the edge with per-device authentication, built-in device management and scaled provisioning. In cloud-to-device messages, reliably send commands and notifications to your connected devices and track message delivery with acknowledgment receipts. Automatically resend device messages as needed to accommodate intermittent connectivity. Azure IoT Hub is a Platform-as-a-Services (PaaS) managed service, hosted in the cloud that acts as a central message hub for bi-directional communication between an IoT application and the devices it manages. Azure IoT. Connect devices, analyze data, and automate processes with secure, scalable, and open edge-to-cloud solutions. Help safeguard physical work environments with scalable IoT solutions designed for rapid deployment. IoT security. Strengthen your security posture with end-to-end security for your IoT solutions.



5. RESULT

When a malfunction is detected, information about the malfunctioning component is stored. Technicians can download the information with a "scan tool" to help fix vehicle. Information also used by Smog Check inspectors. Information is communicated in a standardized format so one tool works with all vehicles (SAE and ISO standards).



6. PROPOSED SYSTEM

- Our system previously indicates the failure of the parameter which are monitor by using sensors. hence, we can avoid the huge failure and accidents of the vehicles.
- This System Proposed Before going to the repair station you can try to know and repair the vehicle in advance in this system using online mode.

7. CONCLUSIONS

This project describes about On-Board Diagnostics and Driver Profiling to the user. The project proposes the use of an Android application to fetch and display the Diagnostics Trouble Codes (DTC) from the car Engine Control Unit (ECU) and thereby facilitates self-car maintenance. The proposed android application processes hexadecimal data of the DTC stored in the car ECU and presents them in a user-readable manner to the user. The proposed android application is also capable of providing a simple, immediate and cost-effective profile of the driver's behavior. This proposed method is by means of tracking GPS co-ordinates of the moving car resulting in a Driver Score. The Driver Score defined as the probability risk of the driving behavior leading to an accident for the observed trip for this approach. This project also proposes an alternate, detailed and novel approach to profile the driver visually and analytically using Machine Learning and Data Analytic techniques. The proposed driving behavior analysis method [3:17 pm, 14/01/2022] : utilizes OBD interface to collect a number of critical driving operation data, i.e., vehicle speed, engine speed (RPM), throttle position, and calculated engine load. The driver behavior is profiled visually using K-means clustering algorithm along with the Elbow method to engine speed and vehicular speed. The visualization assists the user to interpret bad driving behaviors. The driver's behavior is profiled analytically by setting thresholds to engine speeds, throttle valve and engine load resulting in a Driver Score. The Driver Score is defined as the percentile of bad driving behaviors over the observed period. The results from all the proposed approaches assist the user.



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Online Networking Dashboard for Monitoring Vehicles

Mr. Arunkumar.M¹, Dr. Venkatesh.C², Dr. Aarthi.C³

Anbalagan.M⁴, Navin Kumar.V⁵, Srivignesh.K⁶

¹Assistant Professor, Department of ECE, Sengunthar Engineering College, Tiruchengode,(INDIA)

²Professor, Department of ECE, Builders Engineering College, Kangeyam, (INDIA)

³Professor, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA)

^{4,5,6}Student, Department of ECE, Sengunthar Engineering College, Tiruchengode, (INDIA)

ABSTRACT

The automotive industry is facing new and pressing challenges. The automotive industry is a major industrial and economic force worldwide. Safety is important concern too, keeping your car in good condition. A connected vehicle can send information and also connect to the emergency services in case of an accident. A constellation computer chips and sensors placed throughout a connected car collect a performance data, which is processed in the cloud to predict when a part might require maintenance. Automotive electronic system that provides vehicle self-diagnosis and reporting capabilities. Computer system inside of a vehicle that tracks and regulates of a vehicle that tracks and regulates a car's performance. Computer system collects information from network of sensors inside the vehicle, which the system can then use to regulate car or alert the user to problems. The rising trend of Autonomous Things is largely driven by the move towards the Autonomous car, that both addresses the main existing safety issues and creates new issues. The autonomous car is expected to be safer than existing vehicles, by eliminating the single most dangerous element - the driver. The parameters monitoring modules grant a way to automatically updating of the vehicle's condition to the user through which the user can be never bothered about the health of the vehicle. It reduces the stress of the users about the vehicle and ensures protection of the vehicle.

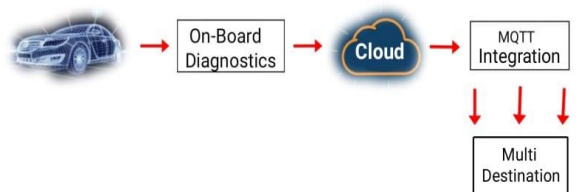
Keywords: *Automotive, Cloud, Connected cars, Multiple devices, Parameters.*

1. INTRODUCTION

The tangible devices connect and interact with each other over a wireless network. Connected objects (or things) share data with each other and operate without any intervention by humans. The possibilities that technologies bring for the automobile industry are really immense. Connected cars facilitate fast transmission of data and increase drivers' response time through enhanced vehicle communication. The sensors embedded in different components of a car collect data and share it to a platform. This data is then processed by an algorithm that can analyze the future outcomes of the component based on its performance. It also helps a person to take necessary steps to prevent its car parts from sudden breakdown. Just like dashboard indicators of a vehicle, this system alerts the driver about probable malfunctions. By using these technologies, a person can confirm the performance of its vehicle and repair its car parts before they break. Using OBD scanner to collect the sensed data and these data will sent to the cloud for analyze the performance. Using MQTT integration, we can analyze

multiple devices data and shared to the service room and the owner of the car. Connected cars are generating car data attributes that specify location, engine status, speed, and much.

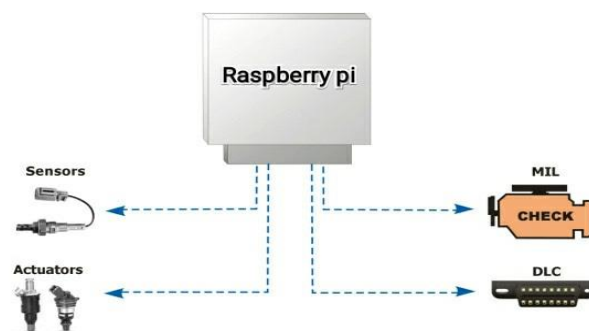
2. BLOCK DIAGRAM



3. METHODOLOGIES

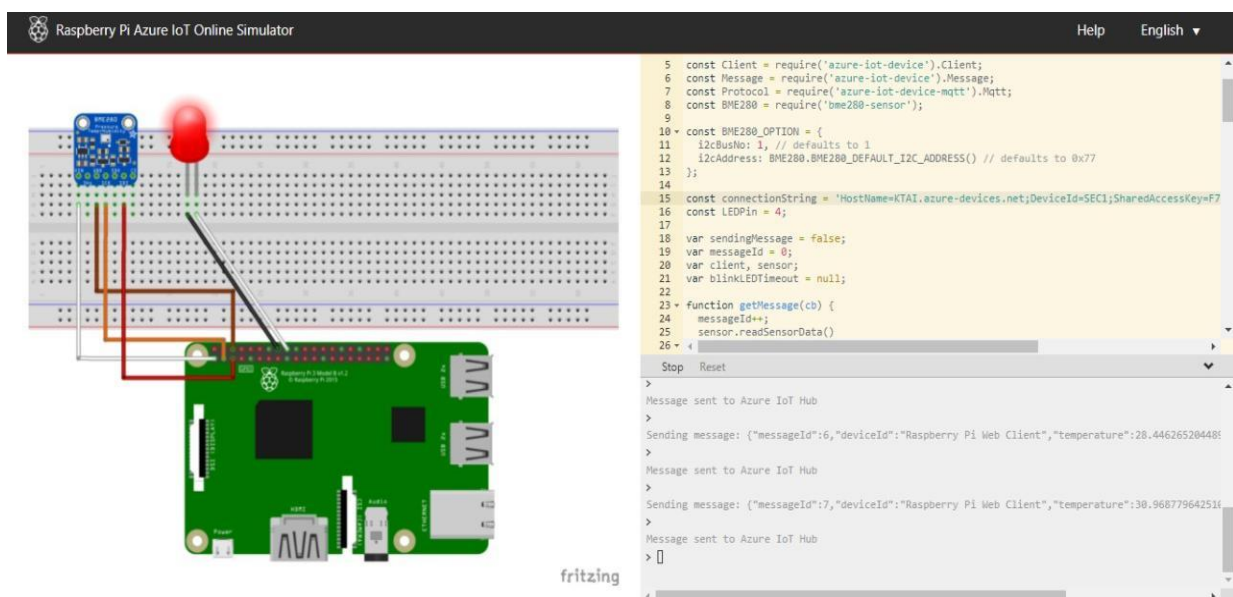
3.1 On-Board Diagnostics

A system in the engine’s on-board computer that monitors the performance of almost every emission-related component for malfunctions. When a malfunction is detected, information about the malfunctioning component is stored. Technicians can download the information with a “scan tool” to help fix vehicle. A basic OBD system consists of a Raspberry Pi, which uses input from various sensors (e.g., oxygen sensors) to control the actuators to get the desired performance. The “Check Engine” light, also known as the MIL (Malfunction Indicator Light), provides an early warning of malfunctions to the vehicle owner. A modern vehicle can support hundreds of parameters, which can be accessed via the DLC (Diagnostic Link Connector) using a device called a scan tool. A mechanic who wanted to access diagnostic information typically had to buy a tool for every different vehicle make. OBD-I scan tools that support multiple protocols are supplied with an array of different adapter cables. It is a computer-based system originally designed to reduce emissions by monitoring the performance of major engine components.



3.2 Raspberry Pi Simulator

Raspberry Pi simulator that allows users to write code to control emulated hardware, and that currently lets users interact with an LED and collect data from a sensor. The simulator shows a graphic of a Pi wired to a combined humidity, temperature, pressure sensor and a red LED via a breadboard, a plug board that allows circuits to be wired together rapidly. Users can type in a side panel to enter Node.js JavaScript code, which can be used to control the LED and collect dummy data from the simulated sensor. That code can be executed using a command line at the base of the panel.



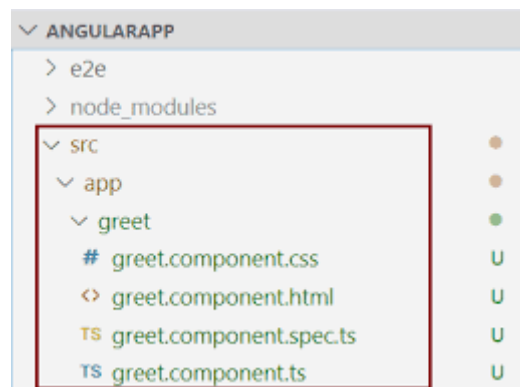
3.3 Azure IOT Cloud

Azure IoT Hub provides a cloud-hosted solution back end to connect virtually any device. Extend your solution from the cloud to the edge with per-device authentication, built-in device management and scaled provisioning. In cloud-to-device messages, reliably send commands and notifications to your connected devices and track message delivery with acknowledgment receipts. Automatically resend device messages as needed to accommodate intermittent connectivity. Azure IoT Hub is a Platform-as-a-Service (PaaS) managed service, hosted in the cloud, that acts as a central message hub for bi-directional communication between an IoT application and the devices it manages. Azure IoT. Connect devices, analyze data, and automate processes with secure, scalable, and open edge-to-cloud solutions. Help safeguard physical work environments with scalable IoT solutions designed for rapid deployment. IoT security. Strengthen your security posture with end-to-end security for your IoT solutions.



3.4 Angular

Angular is an application design framework and development platform for creating efficient and sophisticated single-page apps. Angular is a development platform, built on TypeScript. As a platform, Angular includes: A component-based framework for building scalable web applications. A collection of well-integrated libraries that cover a wide variety of features, including routing, forms management, client-server communication, and more. A suite of developer tools to help you develop, build, test, and update your code. Components are the building blocks that compose an application. A component includes a TypeScript class with a `@Component()` decorator, an HTML template, and styles. Every component has an HTML template that declares how that component renders. You define this template either inline by file path. Angular extends HTML with additional syntax that lets you insert dynamic values from your component. The Angular CLI is the fastest, straightforward, and recommended way to develop Angular applications. As an application framework, Angular includes a collection of well-integrated libraries that cover a wide variety of features. The Angular libraries include routing, forms management, client-server communication.

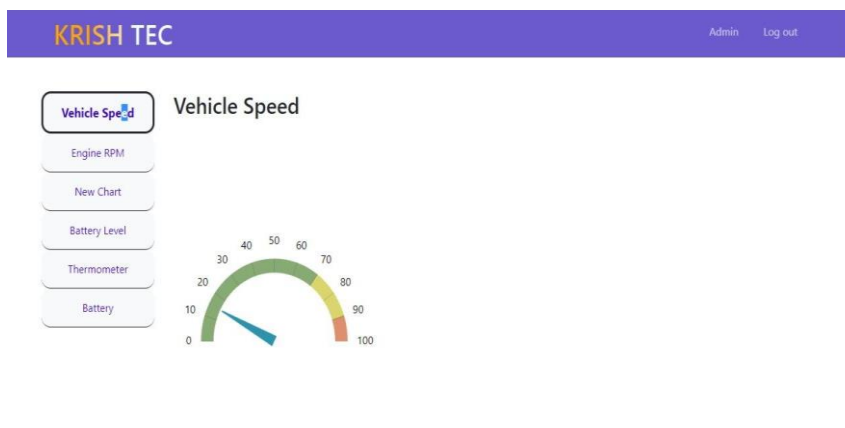


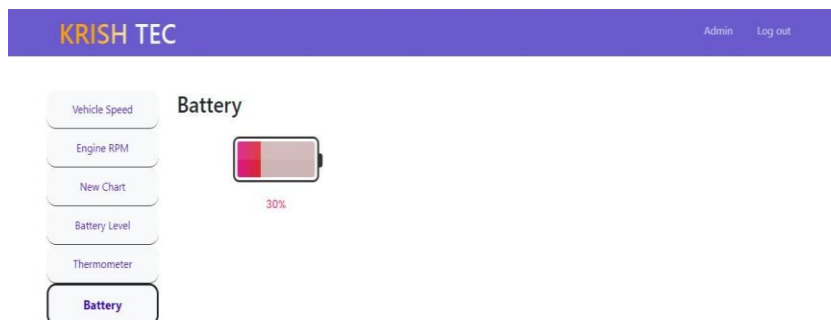
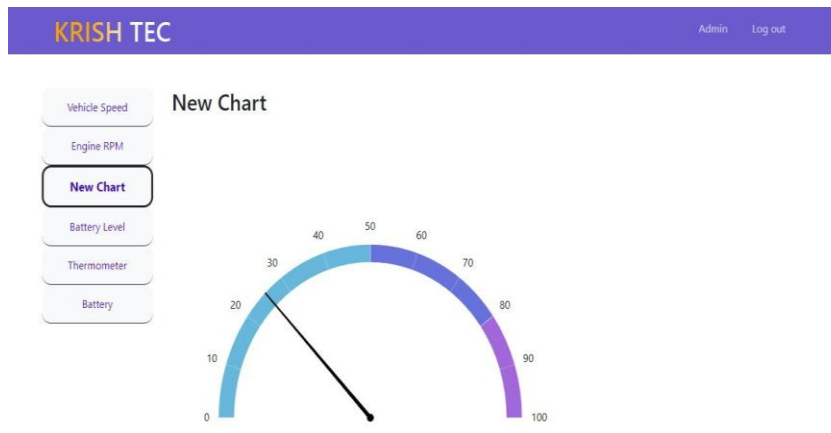
3.5 MQTT Integration

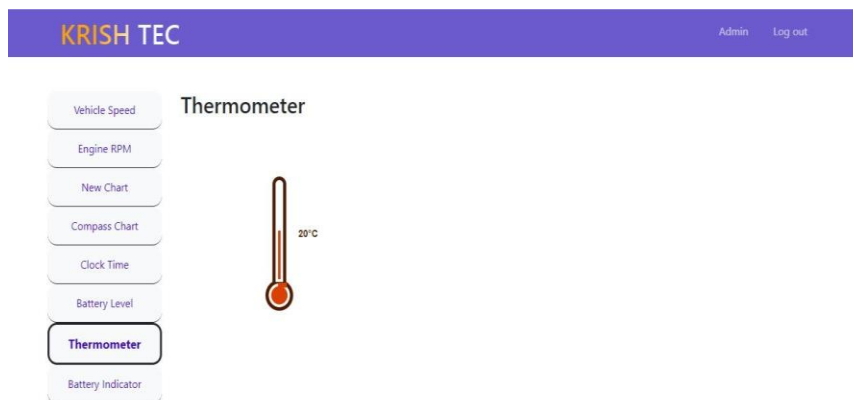
MQTT is an OASIS standard messaging protocol for the Internet of Things (IoT). It is designed as an extremely lightweight publish/subscribe messaging transport that is ideal for connecting remote devices with a small code footprint and minimal network bandwidth. MQTT clients are very small, require minimal resources so can be used on small microcontrollers. MQTT message headers are small to optimize network bandwidth. MQTT allows for messaging between device to cloud and cloud to device. This makes for easy broadcasting messages to groups of things. MQTT can scale to connect with millions of IoT devices. Reliability of message delivery is important for many IoT use cases. This is why MQTT has 3 defined quality of service levels: 0 - at most once, 1- at least once, 2 - exactly once. Many IoT devices connect over unreliable cellular networks. MQTT's support for persistent sessions reduces the time to reconnect the client with the broker. MQTT makes it easy to encrypt messages using TLS and authenticate clients using modern authentication protocols.



4. RESULTS







5. CONCLUSIONS

As newer innovations automotive vehicles achieve economies of scale and customer acceptance, the nature of business is likely to keep changing. The inclusion and participation of analytics software vendors, applications service providers, and infrastructure stakeholders will play a greater role in the system and lead to a redistribution of roles in the industry. Automakers will be faced with a number of challenges in this transformation and need to take a number of steps to reinforce their core value propositions as the ecosystem of connected cars evolves. Evolution in this field has brought in the emergence of trailblazing development in automobiles in terms of connected and automated cars. Its usage has revamped car inspection and maintenance capabilities and presented new mediums of entertainment. IoT applications in the automotive industry are increasing day by day. With the enhancement in the technology of Internet of Things, more refined automobile use cases will pop up that will completely change the way in which we interact with our vehicles.

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AI Based Autonomous Car Driving Using Brainwaves

¹Mr.P.Sivasankaran AP/ECE, ²Dr.C.Venkatesh CEO

³Sibiyarasu S Student/ECE, ⁴Dhanush N Student/ECE,

⁵Ganeskumaran S Student/ECE

ABSTRACT

In the current world, all types of cars are coming into the market, but not all people are not driving a car except a few. This paper considers the development of the brain-driven car. The purpose of our project is to control the car by physically disabled and abled person and also to reduce the accidents[1]. Since these cars will run on what the individual is thinking, they will not require any mechanical action of the driver. Most researchers hope that their work will eventually be incorporated into a machine with general intelligence (known as strong AI). Here, we use a methodology of AI (Artificial intelligence) which is the latest and advanced technology. It works on the asynchronous mechanism of Artificial intelligence. Also using the algorithm of Deep Learning algorithms gives fast processing and the major one of our projects is a dataset (human brain signal) for controlling the car. By using the brain signal the car will move automatically by what the controller is thinking. This is one of the advanced technology in automobiles[2].

Keywords: *AI, Deep Learning, EEG headset*

1. Introduction

The branch of computer science is concerned with making computers behave like humans. The term was coined in 1956 by John McCarthy at the Massachusetts Institute of Technology. Currently, no computers exhibit full artificial intelligence. The best computer chess programs are now capable of beating humans. Today, the hottest area of artificial intelligence is neural networks, which are proving successful in several disciplines such as voice recognition and natural-language processing. Devices that pick up brain waves and translate them into mechanical action are being developed to control prosthetic limbs, robots, and video games. But now comes the Brain Driver, a car that is driven entirely by your thoughts and does not require to perform any mechanical operation of the vehicle. Brain-controlled technology has been implemented in all types of vehicles such as cars, bikes, bicycles, etc[1]. **Artificial Intelligence** is an approach to making a computer, a robot, or a product to think how smart humans think. AI aims to improve computer functions that are related to human knowledge, for example, reasoning, learning, and problem-solving. Artificial intelligence (AI) is the ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans because they require human intelligence and discernment. AI will provide human-like interactions with software and offer decision support for specific tasks. AI technology is important because it enables human capabilities understanding, reasoning, planning, communication, and perfection. It gives perfect accuracy of the output[2]. A regular car requires a human driver sitting behind the steering wheel and doing all the tasks from steering to navigating to gear-



shifting, it also may lead to making accidents. On the contrary, A self-driving car, also known as an autonomous vehicle, driverless car, or robotic car, is a vehicle that is capable of sensing its environment and moving safely with little or no human input. The future of this technology may have an impact on multiple industries and other circumstances. It may prevent accidents. So, the AI technology is entered into the autonomous vehicle is taken into the next stage which is AI-based autonomous car driving using brain waves. In this method, the car is fully controlled by the brain, hence not requiring any mechanical action. Finally, the organization of the study is to AI-based brain signal-controlled car to fully controlled by a brain is to become predict the accidents, accuracy and time-saving. This technology is not only used in a car but also used in various vehicles.

2. Literature review

a. Brain Controlled Car for Disabled Using Artificial Intelligence (Neuro Car)

This paper features about brain controlled car that uses asynchronous mechanism of artificial intelligence. This is of prime use to the physically disabled as it does not rely on any physical movements on the part of the individual. The car integrates signals from a variety of sensors like video sensor, weather monitor sensor, anti-collision sensor, steering sensor, Global positioning sensor among the others. Automatic navigation system ensures that the route to all the areas are mentioned in the database for selection by the driver. Automatic security system ensures the safety of the driver from the other autonomous vehicle. This system ensures that the handicapped is able to thrive individually without needing to depend on others for monitoring. This is an era of technology and artificial intelligence is going to conquer the globe in the years to come. With a few modifications to the existing system and an unanimous support from the government and the society, this project can be used to serve the disabled in greater ways and bring about a revolutionary change in the society. Thus the integration of bioelectronics with the automatic system is going to be the hour of the need for all futuristic vehicles. The brain is incredibly complex. All thoughts or actions are the result of simple electric signals in the brain is a gross understatement. There are about 100 billion neurons in a human brain. Each neuron is constantly sending and receiving signals through a complex web of connections. The driver has to think really hard and concentrate a lot to produce the distinct brain patterns which train the brain-computer interface to produce the corresponding sustained physical motion of the car[3].

b. EEG-Based Brain-Controlled Mobile Robots: A Survey

EEG-based brain-controlled mobile robots can serves powerful aids for severely disabled people in their daily life, especially to help them move voluntarily. In this paper, we provide a comprehensive review of the complete systems, key techniques, and evaluation issues of brain-controlled mobile robots along with some insights into related future research and development issues. We first review and classify various complete systems of brain-controlled mobile robots into two categories from the perspective of their operational modes. We then describe key techniques that are used in these brain-controlled mobile robots including the brain-computer interface techniques and shared control techniques. This description is followed by an analysis of the evaluation issues of brain-controlled mobile robots including participants, tasks and environments, and evaluation metrics. We conclude this paper with a discussion of the current challenges and future research directions. The major difference between brain-controlled mobile robots and other brain-controlled devices is that these mobile robots

require higher safety because they are used to transport dis-abled people. Many researchers have developed various brain-controlled mobile robots using different BCI techniques as well as other techniques such as intelligence techniques (in sensing situations, localization, and path planning) and shared control techniques so as to make these robots safer. The cost of EEG is effectively high and cannot take to any places and it take time to analyse the result[4].

c. A brain controlled Wheelchair to navigate in Familiar Environments

While brain-computer interfaces (BCIs) can provide communication to people who are locked-in, they suffer from a very low information transfer rate. Further, using a BCI requires a concentration effort and using it continuously can be tiring. The brain controlled wheelchair (BCW) described in this paper aim sat providing mobility to BCI users despite these limitations, in a safe and efficient way. Using a slow but reliable P300 based BCI, the user selects a destination amongst a list of predefined locations. While the wheelchair moves on virtual guiding paths ensuring smooth, safe, and predictable trajectories, the user can stop the wheelchair by using a faster BCI. Experiments with non dis- abled subjects demonstrated the efficiency of this strategy. Brain control was not affected when the wheelchair was in motion, and the BCW enabled the users to move to various locations in less time and with significantly less control effort than other control strategies proposed in the literature.To develop a brain controlled wheelchair for navigation in familiar environments, we decided to use a slow but reliableinterface for destination selection, and motion guidance for safe and autonomous navigation. The results obtained with healthy subjects demonstrate that our strategy enables them to move the wheel chair in a building environment safely, efficiently, with limited effort and in a reasonable time.To manufacture the wheelchair it takes more cost and the thinking capability is more important[5].

3. Research methodology

Fig.1 Shows To implement the AI based Autonomous Car Driving, we have to choose a vehicle which has a Bluetooth or Wifi connection, it could be connected with a computerwith EEGcaptured signals,then we have to take a decision from which direction we have to go (left,right,straight,forward,stop) for example, if we give a right direction command to the car suddenly the EEG captured right command signal and send to the computer, similarly it can captured the signal for left, forward, stop direction command which the signal is called Training set. Minimum we can store one thousand command like this. Then we have to prepared the algorithm to train the signal. After that when we driving a car we have to give the direction,for example if we think to go the forward direction, the computer automatically captured the signalby EEG. Then the captured signal is compared with previous signal. This technique is called Pattern matching. If the pattern is matching it can trigger the signal. Then the triggered signal is sent to the Microcontroller with the help of Bluetooth or Wi fi connection to the Robo Car. After that the car can start moving.

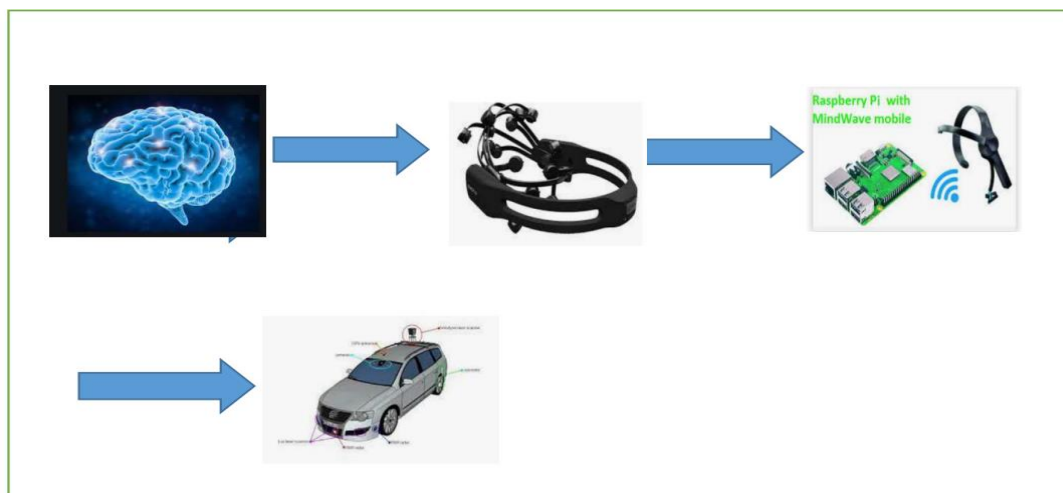


Fig.1.Brai

n controlled car

In this project, it has many methods like brain captured sensor method, EEG based method but here, we are using online dataset method which has the dataset already in online., so we have to train the signal using the Deep learning Algorithm because it gives the better output and fast processing. This method used in many fields like car, Ambulance and other automobiles etc,

4. Results

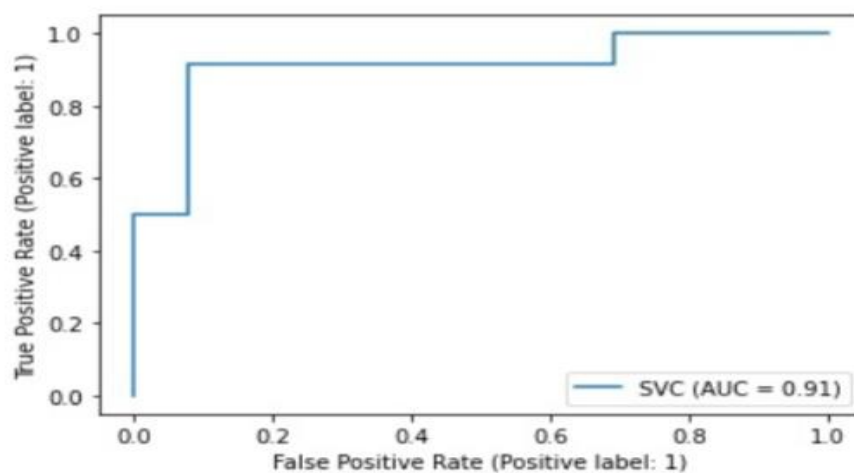


Fig.2.Result of Proposed System

This is the graph of proposed system Fig.2 shows the time and accuracy level rate of the project. By using the deep learning algorithm it gives the fast processing and better output. Compared to existing method.



5. Discussion

In this method by using the dataset for comparing the signal it gives a proper output. that is controlling the car like the direction of left, right, straight, forward, stop. Comparing to the previous method it gives a accuracy level increases and take less time to reach the destination. By using the AI based autonomous car using brainwaves it is one of the latest technology in the automobile field. This emerging technology can make even the physically challenged person to be abled.

6. Conclusion

This technology would allow the driver to control the car with their mind itself. Drivers will be able to control their vehicle much faster than they would do with the conventional method. By using deep learning algorithm method we obtain the results like command left, right, straight, forward, stop. By introducing this method is useful for the all the peoples to drive a car easily and quickly. But don't stop this method here itself and make it to move to the next step of the technology.

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Artificial Intelligence based Chat Bot for Patient Health Care

¹Anandan P, ²Kokila S, ³Elango S, ⁴Gopinath P, ⁵Sudarsan P

¹ Associate Professor, Department of Electronics and Communication Engineering, Vel Tech Rangarajan Dr Sagunthala R&D Institute of Science and Technology, Chennai, India.

² Assistant Professor, Department of Electronics and Communication Engineering, Vivekanandha College of Engineering for Women, Tiruchengode.

³ Professor, Department of Electronics and Communication Engineering, Paavai Engineering College, Namakkal.

⁴ Assistant Professor, Department of Electronics and Communication Engineering, Sengunthar Engineering College, Tiruchengode.

⁵ Assistant Professor, Department of Electronics and Communication Engineering, Er. Perumal Manimekalai College of Engineering, Hosur.

¹anand.phd.dip@gmail.com, ²kokilaee@vcew.ac.in, ³nandhu_prema@yahoo.co.in, ⁴mail2gopiece@gmail.com, ⁵sudarsanps@gmail.com

Abstract— India is a country with an increasing population of more than 1.3 billion yet lack of medication is a crisis here. While travelling around government hospitals and as well as public hospitals, it is discovered that there are insufficient numbers of doctors to handle the growing population, where lack of sufficient doctors are the one of the reasons for patient deaths. To overcome these issues, we set to create a medical chatbot using Artificial Intelligence, which has the potential to provide an immediate access about any medical information-based queries. These chatbots helps the patient to discover the nearby specialists and fixing their appointments. If the user is suffering from severe fever by asking few questions in series the chatbot provides the precautions based on the users' answers or it will suggest any specialists nearby according to the timeline of both user and specialist. In case if the user is searching for any diagnosis centre, for example if he/she needs any MRI scan the chatbot provides the information of labs in surroundings along with the opening and closing times. The design of the software is done through the combination of NLP and Machine Learning.

Keywords — Natural Language Processing, Artificial Intelligence, Decision Tree, Dimensionality Reduction, Feature Selection, Feature Extraction.

I. INTRODUCTION

After the ascent of the web and portable applications, virtual chatbot applications are the most recent developments of computerized plan. These applications are notable for programmed conversational specialists that sudden spike in demand for PC programming or a sort of computerized reasoning Artificial Intelligence (AI) communication between the clients and machines with the intervention of Natural Language Processing (NLP). Chat bots are

conceivably alluded to as the most encouraging and progressed type of human-machine connections. In the long run, these virtual specialists are engaging in the fundamental worldwide areas like medical services, banking, instruction, agribusiness, and so forth. The medical services area is firmly connected with human communication, and it appears to be strange. The utilization of chat bots has spread from client assistance to immeasurably significant issues. Chat bots are entering the medical services industry and can assist with tackling a large number of its issues. Well, being visit bots is to speak with clients. It permits clients to ask clinical inquiries and get replies from specialists. The clinical chat bots assist the clients with presenting their concern about the wellbeing. The client can ask any close to home question identified with medical care through the chat bots without truly accessible to the clinic. Inquiry is shipped off chat bots and gets related responses to the customers. A major sickness can begin from little issues, for example, migraine which feels ordinary however it very well might be the start of large infection like dengue and the greater part of the illness can be recognized by normal indications so the sickness can be anticipated. Wellbeing Service Provider that gives conferences specialists and medical care.

II. LITERATURE SURVEY

A chatbot based medical system [1] has developed a chat bot based medical system based on three phases. The first phase is the pre-processing stage, which incorporates (NLP) Natural language processing methods such as word splitting, punctuation filtering, stop word removal, and porter stemming to find the root word. Aspect extraction and aspect mapping are carried out in the second phase of modelling. In phase 2, the detected topics and aspects are mapped together, and each categorized dataset is assigned to an SVM with machine learning. The trained algorithm recognizes the problem typed by the person in the medical chat bot in the third step, and these problems are linked with data base sets. A Medical chat bot is used to check the state health of the person at anytime [2], anywhere same like

meeting the doctor directly and having medication directly. For predicting the diseases machine learning algorithms are used. There are many machine learning algorithms which can be used for predicting the disease. (SVM) Support vector machine is a technique used for achieving the prediction and for boosting the efficiency of the model. This system uses (NLP) Natural Language Programming for achieving the style of chatting. This NLP algorithm reduces the time spending in hospitals of the patients. This medical assistance chat bot is used [3] for making present generation life easier. As for medical assistance it is taking hours in hospital so the medical assistance came forward in to mobile phone for guiding. By using (NLP) Natural Language Programming algorithm [4], auto response system or chat bot system was implemented to guide the patient based on the symptoms said by the patient and from Doctor Me application treatment records are gathered.

The system proposed by Kavitha, B. R., and Chethana R. Murthy [5] is about implementing a Medical based chat bot system for helping the patients without consulting them to the doctor directly. Here (NLP) Natural Language Programming, (AI) Artificial Intelligence are used and N gram is used for calculation and TF-IDF, Cosine Similarities are also used. This chat bot has the potential to provide patients with access and immediate medical response and also fixes the doctor appointment. The system proposed by Gopi Battineni, Nalini Chintalapudi and Francesco Amenta[6] designed a chat bot for Novel corona virus. As this pandemic was the major crises all over the world, People got suffered in pandemic and lockdown for consulting the doctors and for medical assistance. This chat bot is especially for those people who are suffering with Corona Virus. Algorithms like (AIML) artificial intelligence markup language and some functionalities are used. The designed proposed by Imran Ahmed and Shikha Singh [7] is about implementing an Chatbot using its voice synthesizer. This is an artificial intelligence chatbot with whom humans can interact by speaking. This chatbot can be used in various fields like Education and Medical fields. By using Microsoft voice synthesizer and (AIML) Artificial Intelligence Markup Language algorithms are used for AIML based enabled Artificial Intelligent Chatbot.

III. METHODOLOGY

3.1. Decision Tree:

Decision tree classifier which can be used for both classification and Regression problems is one of the supervised learning techniques, but mostly it is used for solving classification problems. In this there are two nodes they are decision node which is used to make decisions and have multiple branches and the other is leaf node which is the output of those decisions and do not have any further branches. It is a tree structured classifier in which internal nodes represent the features of datasets based on which the decisions are performed and branches represent the decision rules. The name decision tree is given as it is similar to a tree i.e., it starts with a root node and further expands as branches resulting in a structure of tree. Classification and Regression Tree algorithm (CART Algorithm) is used for attaining a tree structure. The decision tree breaks down the

datasets into smaller and smaller subsets while this process happens simultaneously an associated decision tree is developed. The decision tree simply asks a question, and based on the answer Yes/No, it further split the tree into sub trees. The aim is to create a model which predicts the value for a target variable inferred from the data features.

3.2. Dimensionality Reduction:

It is the process of lowering the number of random variables, also known as features, by taking into account numerous aspects, i.e., by generating a set of major variables, and then finalizing the classification based on these factors. Dimensionality reduction is divided into two parts, they are:

1. Feature Selection
2. Feature Extraction

3.2.1. Feature Selection:

A subset of the original set of features is obtained in this method, which can be utilized as a model for the problem. It can be done in three different ways.

1. Filter
2. Wrapper
3. Embedded

3.2.2. Feature Extraction:

In this the dimension space of the data is reduced i.e. the data in high dimensional space is converted to low dimensional space (with less number of dimensions).

IV. PROPOSED MODEL

The proposed system consists of user login credentials in the database maintain, whenever the user logs in to the chatbot it compares the credentials which are present in database if the user is new, it allows the user to register. Then the chatbot asks questions regarding disease diagnosis (like some symptoms) whether the user has this particular symptom or not, which can be seen in the figure – 1. The user needs to answers the queries with yes/YES or no/NO, based on the answer of the user the chatbot predicts the disease by using Decision Tree Classification method. The proposed method not only predicts the disease but also it gives the best suited doctor for that particular disease treatment.

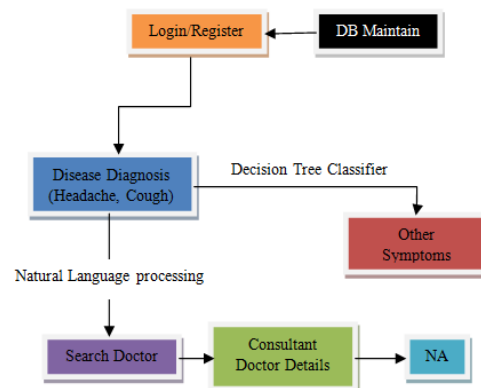


Figure – 1: Block Diagram

V. RESULTS

Step – 1: In this an account login page or a window will pop – up asking the user to either login or register as shown in Figure – 2: Login/Register Page. The user has to login if user already have account. If the user doesn't have an account, then the user needs to register for a new account.

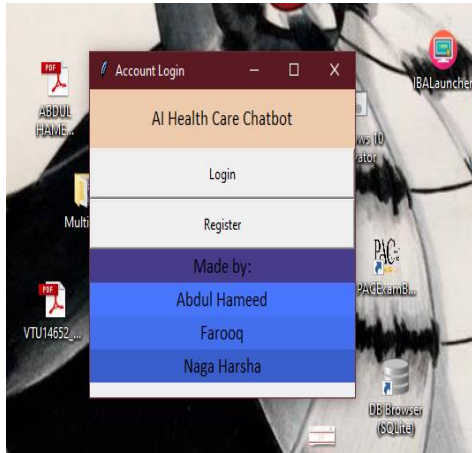


Figure – 2: Login/Register Page

If the user doesn't have an account, then the user needs to register for a new account which is shown in Figure – 3: Register Page.

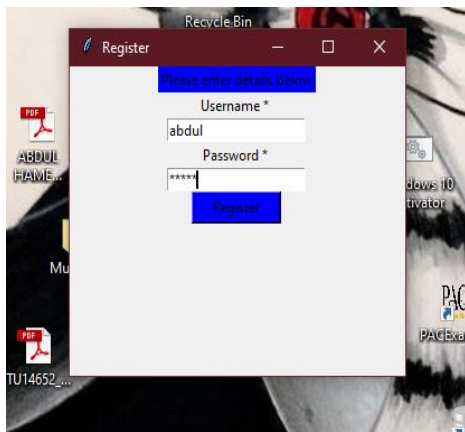


Figure – 3: Register Page

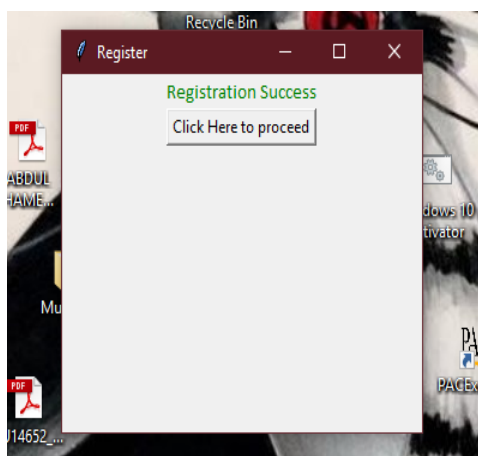


Figure – 4: Registration Success

After clicking on register then an option called “Click here to proceed” comes then the user needs to click on it then it takes to step – 4.

Step – 2: After the user selects the login option an account login window comes up (shown in Figure – 5: Login Page) asking the user to enters his/her credentials.

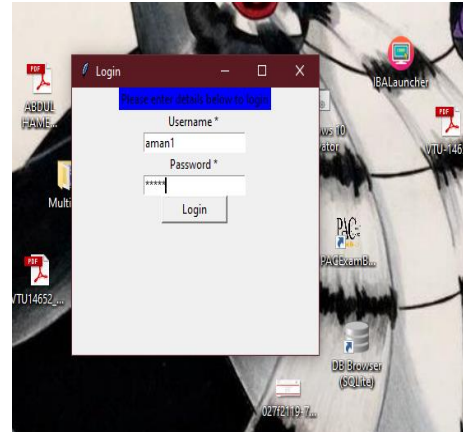


Figure – 5: Login Page

Step – 3: After confirmation of user details from the database a pop-up window showing login successful comes up (Figure – 6: Login Confirmation)

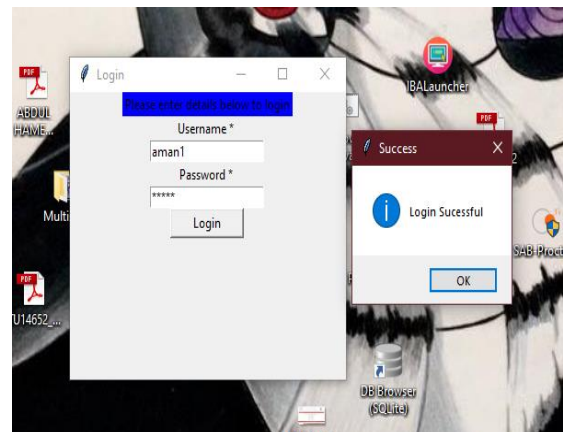


Figure – 6: Login Confirmation

Step – 4: Then after clicking on OK a Self Examine Portal opens up on the screen as shown in Figure – 7: Self Examine Portal Window.

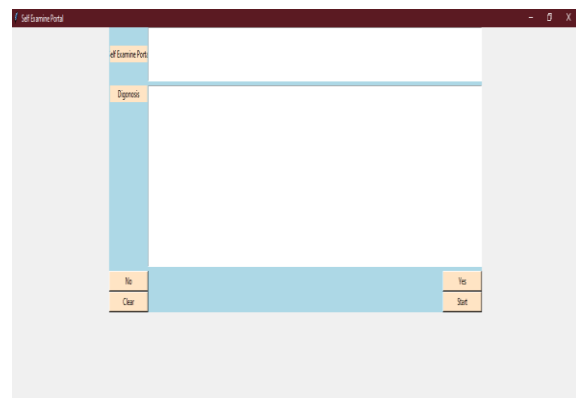


Figure – 7: Self Examine Portal Window

Step – 5: After clicking on Start button the query session gets started where the chatbot asks the queries to the user and the user has to click on Yes or No button based on the queries been asked. If the user clicks on No then the chatbot keep asking questions until it gets matched with the symptoms which it has been trained, when the user clicks on Yes, the chatbot shows the disease and other symptoms for that disease it also gives the best suited doctor along with his website link as shown in Figure – 8: Query Session.

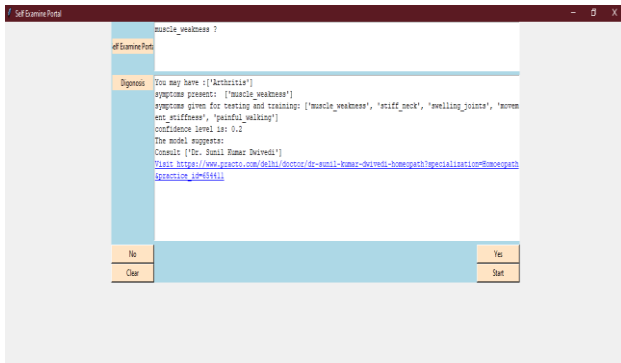


Figure – 8: Query Session

VI. CONCLUSION

In this work, we have concentrated on various types of symptoms for particular diseases. By using Decision Tree Classifier and Dimensionality Reduction Techniques the disease is been identified quite early for example a major sickness can begin from little issues, for example, migraine which feels ordinary however it very well might be the start of large infection like dengue and the greater part of the illness can be recognized by normal indications so the sickness can be anticipated. In this work we are using Decision Tree Classifier to detect the disease based on the queries related to the symptoms for example the chatbot asks the user whether he/she is suffering from joint pains if the user clicks on Yes then the chatbot shows the related disease with those symptoms. By using Dimensionality Reduction, we are reducing the redundancies in the datasets. It also gives the confidence level of that particular symptom. It also helps the patient or the user by providing particular doctor for that particular disease and it also gives the information of that particular consultant doctor.

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Superparamagnetic Iron Oxide Nanoparticles Synthesis by Carrier Oils Stabilization

K. L. Palanisamy^{1*}, K. Vignesh², V. Devabharathi¹

¹Professor, Department of Physics, Sengunthar Engineering College, Tiruchengode, Tamil Nadu, India

²Assistant Professor, Department of Physics, Sengunthar Engineering College, Tiruchengode, Tamil Nadu, India

³Professor, Department of Physics, K S R Institute for Engineering and Technology, Tiruchengode, Tamil Nadu, India

*Corresponding Author: klpalanisamy@gmail.com

ABSTRACT

This work presents the synthesis, characterization, and implication of magnetic nanoparticles in identifying the antibiotic sensitivity on gram positive bacteria with different fatty acids stabilized nanoparticles. The iron oxide nanoparticles were combined utilizing co-precipitation technique and balanced out in different biosurfactants, for example, flaxseed oil, almond oil and olive oil. These nanoparticles were characterized by X-ray diffraction method, FTIR analysis, particle size analyzer and Transmission Electron Microscopy. Structure of initial magnetite nanoparticles synthesized was confirmed by XRD analysis and the estimation of nanoparticles size with the value of 50 -100 nm and it was confirmed with TEM. The attachment of functional groups of oils was predicted using FTIR spectroscopy. Studies indicate that olive oil and almond oil stabilized iron oxide nanoparticles show effective antibacterial activity toward the gram- positive bacterium bacillus cereus compared to flaxseed oil. The results suggest that iron oxide NPs with surface coatings could potentially be used as an effective antibacterial agent.

Keywords-- Antibacterial, Biomedical, Nanoparticles, Spectroscopy, XRD

INTRODUCTION

The nanotechnology has uncovered a wide scope of biomedical applications with different methodologies by thinking about the requirements of greener bioprocesses and novel

enhancers for blend utilizing microbial cycles, biosurfactants, and additionally biosurfactant creating organisms are arising as a substitute hotspot for the quick union of nanoparticles. It is an option greener way to deal with lessen the expenses without forfeiting an excessive amount of value. Biosurfactants are regular surfactants got from microbial beginning made for the most part out of sugar and unsaturated fat [1]. They have higher biodegradability, lower harmfulness, and superb natural exercises. The biosurfactant interceded measure and microbial amalgamation of nanoparticles are presently arising as spotless, nontoxic, and ecologically satisfactory "green science" techniques. The biosurfactant-interceded amalgamation is better than the techniques for bacterial-or parasitic intervened nanoparticle blend, since biosurfactants lessen the development of totals because of the electrostatic powers of fascination and work with a uniform morphology of the nanoparticles. In this audit, we feature the biosurfactant intervened amalgamation of nanoparticles with significant subtleties including a greener bioprocess, wellsprings of biosurfactants, and natural integrated nanoparticles dependent on the accessible writing and lab discoveries [2, 3].

Magnetic iron oxide nanoparticles (MION) have been used in various fields owing to their unique properties including large specific surface area and simple separation with magnetic fields. MIONs present many potential possibilities in biomedicine. Also, the interest in the potential application of the magnetic technique and in food related applications such as enzyme immobilization, protein purification, and food analysis in pharmacy is notably growing [4]. It is currently being recognized that