3.3.1 - Institution has created an ecosystem for innovations and creation and transfer of knowledge supported by dedicated centres for research, entrepreneurship, community orientation, incubation, etc.

Additianal information

S.No	Research Facility	Department
1	Design Space	ECE & EEE
2	Makerspace	Mechanical & EEE
3	AI Lab with GPU based processors	CSE
4	Alumni entrepreneurs	CSE

Total No. of Publications	Department	No. of Publications	Page Number (From -TO)
88	ECE	26	1-44
	EEE	10	45-62
	MECH	24	63-86
	CSE	25	87-98
	CE	3	109

Total No. of Products	Department	No. of Products	Page Number (From -TO)
42	CSE	1	1-44
	CE	3	45-62
	ECE	17	63-86
	EEE	9	87-98
	MECH	12	109

Dr. J. Raja Murugadoss
Director
N.S. Raju Institute of Technology (A)
Sontyam, Visakhapatnam-531173

3.3.1 - Institution has created an ecosystem for innovations and creation and transfer of knowledge supported by dedicated centres for research, entrepreneurship, community orientation, incubation, etc.

Products/Projects Developed	TITLES	Student List
1	Design and Analysis of Swasthik Antenna Array for Wireless Applications	B. Divya, K.Teja Satya Sashanka Varma, S.Sreeja, P. Harshath Varma, N. Naga Chandra Mouli
2	Smart Security System Using RFID and Camera Module for Home and Office	Vyda Jayanth Kumar, Allada Kiran , Pakki Johna Sudeepa Patnaik and Gorivilli Naveen Kumar
3	Automatic Temperature Detection for Safety Entrance	A. Sai Lakshmi, R. Gopichand, S. Hemalatha and D. Teja
4	Visitor System using Public Announcement	E. Meghana, A. Satya Girish, M. Sai Vinay and A. Vandhana
5	Various Full Adder Based 32-Bit Wallace Tree Encoder	S.Gayathri, Ch.Suresh, P.Swarnamala and B.S.V.Satyanarayana
6	IOT Based Industrial Automation	K. Pushkala, S. Yaswanth Kumar, S. Lavanya Kumari and N.J. Srikar
7	Analysis Of Slotted Patch Fractal Antenna With DGS For Multiband Applications	K.Sivani, D.Naga Sravani, G.V.N.Mani Krishna and A.Chaitanya Sravanthi
8	Agricultural Rover Based on Solar Power	V.Yaswant Sai Pawan, K.Madhu Sree, A.Vinaya Sree and K.Sai Charan Raju
9	Smart Cart with Automated Billing	V.Sai Preethi, V.R.V.S.Karthik, R.Teja and P.Jyothi
10	Power and Delay Optimization of 8-Bit ALU using Various Techniques	G.Harshapriya , G.V.V.Vamsi, K.Gayathri Devi and J.Roja Ramani
11	RFID Based Automatic Toll Collection System for Dynamic Charging Vehicles	K.Leela Sai Koteswari , K.G.Deepika, N.Kavya and P.Sai Teja
12	Smart Helmet for Accident Avoidance	Y.Harika , A.Karthik, G.Ramesh and T.Vijaya Bhaskara Varma
13	Emergency Alert System for Disabled People Using Hand Gesture and GSM	D.Aneesha, Ajith Panda, K.Ushasri, G.Lokeswari
14	Railway Track Crack & Object Detection Using GSM & GPS	G. Jaya Sree, V. Manohar and G. Venu Vardhan
15	Design of Smart Bus Fare Collection System Using RFID	P. B. S. S. K. Swetha, P. Sree Bama. V, A. Ram Kumar and S. Ramesh Naidu
16	Design and Implementation of Decoder and MUX using Mixed Logic	K. Harika Devi, A. Ruthik Kumar, E. Ramya and M. Kiran.
17	IOT-Based Smart Notice Board	D.Hima Varshini, D.Tilothama, D.Jagadeesh and I.Jithendra
18	Implementation of High-Speed Low Power 32-Bit Dadda Multiplier Using CLA	K.Hari Krishna, K.Srikanth, B.Neeraj and Y.Akhil.
19	Slotted patch Orthogonal MIMO antenna for UWB applications	B. Kavya, CH. Pavan, D.Divya and S. Sirisha
20	Implementation of Vehicle Starting Using Fingerprint Sensor & Accident Detection with Accelerometer, GSM & GPS	B.Nandini, P.Koteswara Rao, M.Jaswanth, and M.Jyotsna
21	AI Based Robotic Arm	R.Sowjanya, K.Anandkumar, P.Sanjay and K.Sai Kiran
22	IoT Based Smart Stand For LPG Cylinder Monitoring and Safety Enhancement	P. Yaswanth Kumar, Ch. Geetha Sri, S. Pavani and Ch. Sai Kishore
23	Electronic Protection For Exam Paper Leakage Using Arduino Uno	N. Sravani, V.Ramesh, A. Harika and B. Krishna
24	IOT Based Autonomous Robot For Safety Enhancement	K. Jyothi, K. Ramana, Ch. Ramakrishna and ,V. Praveen.
25	Voice and MEMS Based Page Turning Assistor for Disabled People	V. D. K. M. Lakshmi, C. Suryanarayana, R. Pavan Kumar and , P. Sujith
26	Arduino Based Coal Mine Safety Monitoring and Alerting System for Workers	G.Prudhvi Sai Kumar, A.Lavanya, J.Harish Kumar and , P.Vashika

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Design and Analysis of Swasthik Antenna Array for Wireless Applications

Dr. B. Siva Prasad[1] , B. Divya[2] , K.Teja Satya Sashanka Varma[3] , S.Sreeja[4] , P. Harshath Varma[5], N. Naga Chandra Mouli[6]

[1]*Associate professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P., INDIA*

[2,3,4,5,6]*U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P. INDIA*

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ABSTRACT:
In this paper a Rectangular Microstrip patch antenna is designed for multiband operations using low-cost substrate material FR_4. The proposed antenna is simulated using ANSYS HFSS (High frequency structure simulator). The proposed antenna consists of Swasthik shaped EBG cells on the on the ground plane of rectangular MPA.The antenna operates at frequency range 11 to 18GHz with two notch bands and enhanced gain of 7.21db. The swasthik EBG cells modified to get improvement in results than the rectangular MPA.This antenna finds applications in WLAN,Ku Band,K Band, and other wireless communication applications.

KEYWORDS: Rectangular Microstrip patch antenna, HFSS (High frequency structure simulator), EBG (Electromagnetic Band Gap), WLAN

I. INRODUCTION:

Antenna is very important component of communication system. An antenna is transducer which converts the electric signal into electromagnetic wave and vice versa. A Microstrip patch antenna consists of a radiating patch on one side of a dielectric substrate and a ground plane on the other side. So, the design of the patch and substrate directly affects the antenna results. Recently, several techniques have been proposed for overcoming the problem of surface waves. One of the effective methods which suits for the millimeter structures is to use photonic band gap structures.

Using photonic band gap structures has become attractive for engineers and researchers working on antennas, electromagnetic and microwaves. These substrates contain so called Photonic Crystals. Also known as electromagnetic bandgap (EBG) structures and electromagnetic band-gap materials (EBMs) are a class of periodic metallic, dielectric, or composite structures that exhibit a forbidden band, or band gap, of frequencies in which wave's incident at various directions destructively interfere and thus are unable to propagate. On the other hand, the EBG structures also reflect a part of the energy that circulate along the substrate of the antenna, thus acting as reflecting walls across the antenna and thereby the cavity effect. With elite rows of EBG structures, minus energy is reflected, and the parasitic effect becomes prevailing.

This contributes to the significant enhancement in the bandwidths. The 2-D EBG surfaces, have the advantages of low profile, light weight, and low fabrication cost, and are widely considered in antenna engineering. Two popular kind of 2-D EBG are mushroom-like EBG surface and uniplanar EBG surface. An important feature in the uniplanar EBG design is the removal of vertical vias. Thus, it simplifies the fabrication process and is compatible with microwave and millimeter wave circuits. There are several configurations of EBG structures according to their application in antenna. In this paper, an Electromagnetic Band Gap periodic structure is used which swasthik is shape in the ground plane of the microstrip patch antenna. From the experimental results characteristics such as the bandwidth, gain of the antenna are improved by adding the Electromagnetic Band Gap structure on the ground plane.

ANTENNA GEOMETRY

The geometry and the design steps of Microstrip patch antenna are described below a substrate is created with dimensions of 40 mm X

Smart Security System Using RFID and Camera Module for Home and Office

Dr. K. Ravi Kumar[1], Vyda Jayanth Kumar[2], Allada Kiran[3], Pakki Johna Sudeepa Patnaik[4], Gorivilli Naveen Kumar[5]

[1]Professor, [2,3,4,5]U.G. Students
Department of ECE, N. S. Raju Institute of Technology, Sontyam, Visakhapatnam, A.P, India

***Abstract*: In this modern world, everyone wants their belongings to be safe and secure. People want to monitor their homes even when they are away from the place where they are. They want to monitor the home environment being miles away. So this system is proposed for all these purposes. There are many systems in the past that provide each of these features individually. In this paper, the proposed system can monitor the home and can provide immediate updates on whatever is happening. It perfectly distinguishes authorized and unauthorized persons and provides alerts not only by buzzer but also provides captured images of that person too. In addition to this, it alerts in case of fire and gas and also reduces the consumption of power by controlling lights.**

It distinguishes the authorized using RFID module and if any unauthorized entry is spotted. It sends an alert to the owner with attached pictures. So, the probability of false alarms will be reduced. If anyone manages to enter the home by breaking the windows or doors and if such events are spotted by using vibration sensors, the owner will be intimated with the captured images using a camera (ESP32) and GSM module. It alerts in case of fire or gas which will be detected by fire (Flame sensor) and MQ6 gas sensor. It ensures enhanced protection by integrating all these features into a single project.

***Keywords*: RFID, Vibration sensors, Camera Module (ESP32), GSM Module, Flame sensor, MQ6 gas sensor.**

I. INTRODUCTION

There is a high demand for security and safety devices nowadays. They are required to ensure safety and security in our homes and office. Security and safety are provided to ensure that the homes and offices do not become easy targets for burglars and intruders [1]. Doors and windows that are not locked and that are inadequately secured can provide easy access to our homes. Most intruders enter through unlocked doors. In this busy world, people have no time to secure their belongings. Hence, smart devices are needed to secure their homes. In recent years, most fire accidents occur due to gas leakage where a gas leakage problem turns into a huge fire accident [2,3].

The need for securing homes exists since ancient days. Techniques for protecting the households are door locks, barred windows. etc. Nowadays, security systems are all automated which can detect undesired situations occurring at home while the owners are being away. Advancements in
Technology made these security systems precise and more effective. The invention of electronic components like sensors, Arduino. etc. paved the way for the new era of security systems.

"Intelligent Alarm System to Protect Small, Valuable Items" an intelligent alarm system was proposed [4] to protect small and valuable items; like jewellery and other expensive, small size properties. The system utilizes machine learning techniques to intelligently detect threats, based on the environment data collected by different sensors and Arduino microcontroller, and then notify the owner by email message on a real-time basis. When received on the mobile phone, the email activates a unique notification alarm, so the user knows immediately about the threat.

In [5] proposed "RFID Smart card door lock". They designed a security system that provides access to the authorized individuals to enter. They installed a security system that included a door locking system that used passive RFID to activate, verify, and authorize the user and at the same time open the door for secure access.

Smart digital door lock for the Home Automation" was proposed in [8] A smart digital door lock system for home automation. A digital door lock system is equipment that uses digital information such as a secret code, semi-conductors, smart cards, and fingerprints as the method for authentication instead of the legacy key system. In this proposed system, a ZigBee module is embedded in a digital door lock and the door lock acts as a central main controller of the overall home automation system. Technically, the proposed system is a network of sensor nodes with a digital door lock as a base station.

In [10] a system was proposed which is controlled by an Arduino Uno microcontroller centrally. The microcontroller detects the output of Radio Frequency Identification (RFID), keypad 4x4, limit switch, Light Dependent Resistance (LDR) and Passive Infra-Red (PIR) for security of the door. The microcontroller will give a response when it detects the output from the sensors.

A response given by the microcontroller will control the Solenoid, Buzzer, Liquid Crystal Display (LCD) display, and lamp. The door will open if the data/password of RFID and Keypad 4x4 are appropriate. The buzzer will turn on when the limit switch detects an open door without using RFID and Keypad. The lamp will turn on automatically if conditions are dark and there is human movement in the room. The measurement uses a PIR sensor to detect the motion and LDR to measure the light condition.

In this paper section II shows the operation and drawbacks of the existing system. Section III explains the implementation of the proposed security system. The results of the proposed security system are discussed in Section IV followed by the conclusion and future scope.

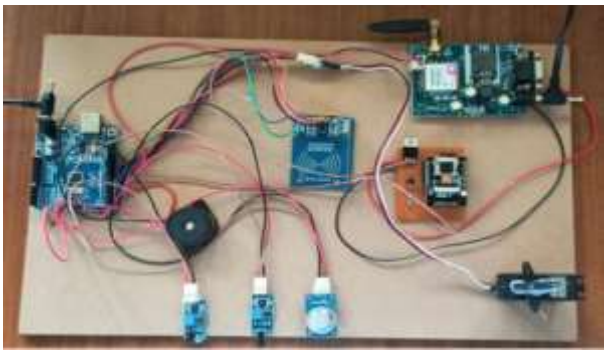

Fig. 3. Smart security system using RFID and camera module for home and office

IV. RESULTS

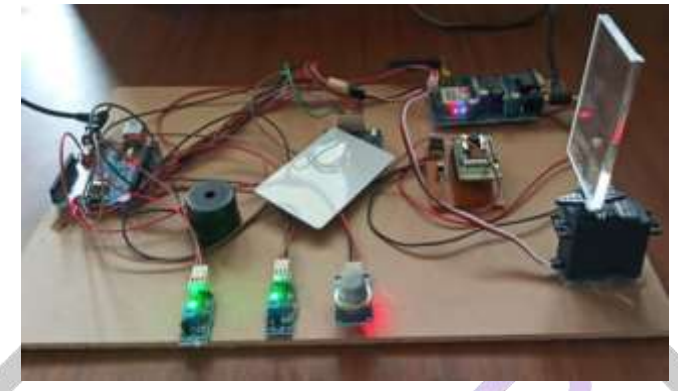

Fig. 4. Access to Authorized Person

If the person is an authorized one then the door opens for 3 seconds as shown in Fig. 4.

Fig. 5. Denied access to an unauthorized person

If the person is unauthorized, then the access is denied as shown in Fig. 5 an alert will be sent to the registered mobile number as "SOME-ONE TRYING TO ENTER THE RESTRICTED AREA" through GSM Module as shown in Fig 7.4 and along with that picture is sent to the registered Mail ID as "INTRUDER DETECTED" as shown in Fig. 6

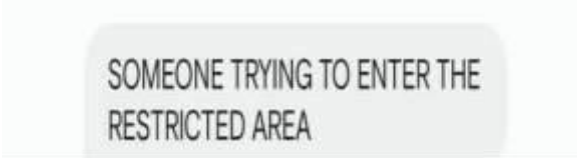

Fig. 6. Message sent by the GSM Module

Fig. 7. Mails are sent by the system along with captured images.

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Automatic Temperature Detectionfor Safety Entrance

M.V.S.ROJA RAMANI[1], A.SAI LAKSMI[2], R.GOPI CHAND[3], S.HEMA LATHA[4], D.TEJA[5]

Asst. Professor, Department of ECE, NS RAJU INSTITUTE OF TECHNOLOGY,SONTYAM, VISAKHAPATNAM
U.G. Scholars, Department Of ECE NS RAJU INSTITUTE OF TECHNOLOGY,SONTYAM VISAKHAPATNAM, A.P.,INDIA

Abstract—*Covid-19 has made a huge impact on the society. The new restriction has been imposed regarding entrances of multiple people in various places include schools, colleges, hospitals, offices,shopping malls etc., To stop the spreading of infection, social distancing and thermal screening are being adapted everywhere. The thermal screening is currently being done manually and there is a huge chance of errors in human temperature detection. Moreover, thermal screening requires human intervention. Taking these into considerations this project is developed for safety entrance based on human temperature detection. In this entrance system the temperature of a person is checked at the entrance without human intervention, hence everything can be done automatically.*

Keywords: *ESP32, IR Sensor, OLED Display, Buzzer, MLX90614 (Contactless Temperature Sensor), Servo motor*

Date of Submission: 02-06-2022 Date of acceptance: 15-06-2022

I. INTRODUCTION

Since, Covid -19 pandemic is considered as the most critical worldwide well being disaster of the century and the best test that theman kind has gone through after second world war. The side effect of disease are fever and body pains.

Since December 2019 we have gone through many changes in our lives. The quantity of patients for most part was expanding step by step enormously. So, by watching this condition and by remembering all the rules we made some set ups like contact less sanitization and bodytemperature detector. It was programmed by non-contact waterless 70% alcohol based sanitized container showing that so by watching this extremely momentum condition and by remembering all these rules we made some investigated deal with contactless sanitization &body temperature detector identify gadget. The disease can spread even from the air infected with the virus. The disease was found in Wuhan, China with some confirmed cases and several deaths and later they are found in various places of China. This gives the clear idea the disease can easily spread from one place to another easily.

II. OBECTIVE

The main aim of this entrance system is to avoid the human involved intervention for checking the temperature of people at various places. The main theme of our project refers to embedded system technology that includes IOT in this entrance system by using contactless temperature sensor (MLX90614) the temperature of human is measured. This measured value is checked with the fixed threshold value, if the measured value is less than the threshold value is allowed inside. Otherwise that person is restricted by closing the door and pointing person with a buzzer indication. Here everything is done automatically by using internet by the user. In addition to this the countof predefined persons can only be allowed.

III. LITERATURE SURVEY

1. Here we have taken the some of the existing systems for measuring the temperature of a person without any contact they include “RFID based Contactless body temperature screening using Arduino MLX90614 IR temperature sensor”[1]. Here the process include when a person scans his RFID card and EM18 RFID Reader sends the data to the microcontroller Arduino Uno is using UART communication. Now the temperature of the person is measured using a non-contact infrared thermometer using the MLX90614 sensor. The temperature is measured one only when the person is less than 25 cm from the thermometer &ultrasonic sensor is used for this purpose. This temperature is noted against the name is read through RFID reader directly to an excel sheet. This is also an attendance system which stores the temperature of each and every person. As

V. RESULT

VI CONCLUSION

The covid 19 pandemic is considered as the most world wide well being disaster of the century and there may be chance of getting this type of pandemics in future. For these the best test that the mankind looked since the second world war. The normal side effects of this disease are fever, cough, and if the temperature screening is done the conceivable spread of the infection can be restricted partially. This framework empowers a completely programmed contactless temperature evaluating for entrance access. Right now, the temperature screening is done physically and it not just turns out to be exceptionally troublesome with regards to enormous scope yet their can be carelessness of the watchmen as well. In places like air line stations and metro stations , the large number of individual show up and leave which are dangerous spots for spreading of infection. In the event that the computerised temperature screening measure is utilizedin such area, it makes the screening cycle quick, as well as stops the spread of contamination generally. This framework entrances can like has been carried out in the shopping centres', film, grocery and many other places. This type of framework can be implemented into previously existing program entry ways like e.g. Glass entry ways with an extremely less adjustments. The manual framework where in observing is required, it also require heaps of cash to keep up and were costly, utilising the above framework the clients can meet these expenses and reliance on manual framework.

VII FUTURE SCOPE

We can implement this model in future with the camera module in order to detect the person with no mask. Same as having improper temperature levels if a person not wearing mask can be restricted by buzzer indication and noticing him with the help of camera module.

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Visitor System using Public Announcement

K. Rajasekhar[1], E. Meghana[2], A. Satya Girish[3], M. Sai Vinay[4], A. Vandhana[5]

Asst. Professor, Department of ECE, N S Raju institute of Technology, Sontyam, Visakhapatnam, A.P, India

Abstract-*This proposed system completely describes the voice announcement system and parent verification for the safety of the students. In this model each and every student must store their roll number with their parents or guardian's mobile number. This proposed system takes Roll Number of student from the user and the system access the parent's authorized phone number automatically from the data base, the entire system is placed in the office room or the reception. When the parents enter student roll number the system gets the corresponding phone number and sends an OTP through App and requests parent to enter OTP. If the entered OTP is correct then the system will send a notification to authority and based on the response from authority it will send a voice notification to the students. In the proposed system two level securities with OTP matching from parent along with authority permission are provided.*

Keywords-*One Time Password (OTP), Light Emitting Diodes (LEDs), Liquid Crystal Display (LCD).*

I. INTRODUCTION

It is very Important strand in maintaining discipline among Employee/Student in an organization and imparting quality education in schools, colleges and if someone drifts from required standards proper action can be taken. Thus, introducing an important step in taking proper precautions from hostile visitors.A Conventional way of visitor meeting a student or professor in schools/colleges is by calling his/her respective name via office clerk with the help of messenger handing over a receipt of the student's REGD number, and the student meet their visitor. Same process is with professors or an office employee in other organizations.

Under certain circumstances we see that we seem to put the student, professor or an employee in the harm's way, since no authentic biometric data is recorded and the details provided might not be real. Keeping in mind, with respect to above problems we shall now introduce a simple yet reliable method of visitor meeting their guest in school/college/office ensuring there is no discrepancy in the meet.

II. LITERATURE SURVEY

A. Previous System and Its Demerits

The Primitive way of conducting visitor meet was via receptionist calling a clerk to writing over a piece of paper of the student to be called and in that way the clerk goes over the classroom and calls the student.

The Demerits due to the above is as follows:

- Extensive Paper work like maintainingregisters and consuming huge space for the registers.
- High human efforts like walking around the campus just to pass a message.
- No proper data is stored permanently and the data is not relied.
- The visitor might also be hostile.

B.Proposed Method

- Covering the Demerits, the project will not only remove the above demerits but also increases the ease of work flow making fewer human efforts and complexity.
- Introducing VISITORSYSTEM USINGPUBLIC ANNOUNCEMENT. In this the visitor biometric is saved as well as the data is stored, where the storage complexity is not present.
- In this regard we use Hardware and software sections.
- Therefore Extensive paper work is reduced as we are using web servers to store data. Human effort is reduced and also data is stored.
- The student is then called via speakers.Then the respective student goes to thereception.

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Various Full Adder based 32-Bit Wallace Tree Encoder

Y. Sravana Kumar
Asst. Professor, Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India.

Ch. Suresh
U.G. Scholor, Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India.

S. Gayathri
U.G. Scholor, Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India.

P. Swarnamala
U.G. Scholor, Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India

B. S.V. Satyanarayana
U.G. Scholor, Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India

***Abstract*: Now a days in Analog to Digital conversion using, an analog to digital converter (ADC), converts any analog signal into quantifiable data, which makes it easier to process and store, as well as more accurate and reliable by minimizing errors. Wallace tree encoder plays a crucial role and it based on converting thermometer code into binary code in ADC. In this project we design 32-bit Wallace tree encoders with Various Full Adder Techniques like CMOS, Pass Transistor Logic (PTL), Hybrid technique, Gate Diffusion Input (GDI) and Proposed Modified Gate Diffusion Input (M-GDI) Technique. The proposed MGDI technique provide Less Delay, Less Power Consumption, Better Power Delay Product and a smaller number of transistors compared to existing techniques. The proposed designs are designed and simulated using Mentor Graphics Tool with 90nm CMOS technology.**

Keywords*: ADC, Wallace tree encoder, CMOS, PTL, GDI, MGDI, Hybrid

I. INTRODUCTION

Speed, power dissipation and area are very important parameters of any VLSI based systems. Data conversion circuit plays an important role in high-rate data communications. Analog to Digital Converter (ADC) is an electronic integrated circuit used to convert the analog signals such as voltages to digital or binary form consisting of 1s and 0s. Most of the ADCs take a voltage input as 0 to 10V, -5V to +5V, etc., and correspondingly produces digital output as some sort of a binary number.

In analog to digital conversion process, Wallace tree encoder is utilized in the process of converting the thermometer code to binary. This can be termed to be a high-speed application and a flash type of flash ADC, which is a resistor ladder, encoder and comparator circuit. In electronics, an analog-to-digital converter (ADC, A/D, or A-to-D) is a system that converts an analog signal, such as a sound picked up by a microphone or light entering a digital camera, into a digital signal.

II. LITERATURE SURVEY

Yamini Shanmugam, Gopika Sundari P B, Rithika S and Sanjeev V (2021) proposed an "Comparative Analysis of Low Power Wallace Tree Encoder with Modified Full Adders". They designed a 16-bit low power Wallace tree encoder with modified full adders. Wallace tree encoder consumes more power so, by constructing low power, high performance Wallace tree encoder using PTL resistor ladder logic with modified full adders, the power can be conserved. To design this Wallace tree encoder, they used different types of full adders. The proposed design will be designed and simulated using Tanner EDA V16 tool. The proposed system aims in reducing the number of transistors to get better power efficiency and delay comparator. It has the advantage of correcting bubble error without the need of an extra bubble error correcting block. The proposed Wallace tree encoders are compared with other encoders using full adder. The results show that power consumption, delay and the power transistor count delay will be calculated. Finally, they are selected 16-bit low power Wallace tree encoder with modified full adders to improve high performance [1].

J.M. Mathana, R. Dhanagopal , R. Menaka (2020) proposed an "VLSI Architecture for High Performance Wallace Tree encoder". In the research, the VLSI architecture design for Wallace tree encoder with modified full adder is proposed. In the proposed work, a low power Wallace tree encoder is designed using only pass transistor logic (PTL) full adder. The circuit is designed using CADENCE 5.1.0 EDA equipped and simulated with the application of spectre virtuoso [2].

Rajkumar Sarma and Veerati Raju (2012) proposed as "Design and Performance Analysis of Hybrid Adders for High-Speed Arithmetic Circuit". In this research, a hybrid full adder is designed and analysis the performance for high-speed arithmetic circuit. In this paper, they proposed Gate diffusion technique (GDI) & PTL-GDI technique. Only 10 transistors are used to implement the SUM & CARRY function for both the designs. The SUM and CARRY cell are implemented in a cascaded way. By comparing both the techniques of adders the power delay product and power consumption will be observed. The significance of these designs is substantiated by the simulation results obtained from Cadence Virtuoso 180nm environment [3].

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IOT Based Industrial Automation

P. SAHITYA KIRAN[1], K. PUSHKALA[2], S. YASWANTH KUMAR[3], S. LAVANYA KUMARI[4], N.J. SRIKAR[5]
Asst. Professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA
U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPTNAM, A.P., INDIA

Abstract- *Internet of things (IOT) has made great impact in industries. IOT is a technology that helps us to control the physical devices through internet which is used to reduce the human effort. As India is developing country there are many manufacturing companies. But the major issue in the industries was industrial accidents. But the major issue due to industries was industrial accidents which causes the human and profit loss. To reduce this problem this project is introduced which helps to control and monitor all the industrial parameters, for this purpose we are using different sensors such as fire, gas, mems, humidity and temperature sensors. Along with this alerting system for workers and surrounding peoples there is a voice module and buzzer and light indication which gives them voice and sound alerts that something wrong happening in the industry. And addition of this software was using for live monitoring termed as blynk software which is familiar to the mobile and web dashboard*

Keywords- *IOT, fire sensor, gas sensor, temperature and humidity sensor, mems sensor*

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I. INTRODUCTION

Now a days, the industries require more manual power to monitor and control the parameters in industries like temperature, fire, gas, etc. with the help of single microcontroller and LCD displays. To sense the various parameters the different sensors are aroused in the industry. Here there is no sensing devices in the industry at the time of emergency, it leads to a harmful situation, so, in this project different sensors and alert systems is used under the concept of automation control which is reduce the high manpower necessity, so in this automation method all parameters are sensed by the microcontroller. The issue is displayed on the LCD and immediately the voice alert is comes from the speakers for the inside workers alerting purpose. The light Indication is for surrounding people alerting.

II. OBECTIVE

The main aim of this project is to reduce the industrial deaths and avoid the human effort. The main theme of the project using domain of embedded systems technology that includes IOT in the industries by using different sensors like gas, fire, mems, temperature and humidity sensors to monitor the various parameters. Here relay acts as a kill switch which is activated when things go out of hands. Here voice module, light indication is for the workers and surrounding people alerting and take precautions accordingly along with this we are using Blynk software for live monitoring purpose.

III. LITERATURE SURVEY

By the case study of LG polymers gas leakage taking, it as an example we implemented this concept as a project of “IOT based industrial automation” Here we have taken the some of the IEEE existing base papers for Here we are have taken the some existing systems for monitoring industrial parameters they include “Internet of Things in Industries: A Survey”. In this paper they summarize the current state-of-art of IOT in industries systematically. They tracking and identifies the key enabling technologies involved in IOT include RFID systems, barcode, and intelligent sensors. A simple RFID system is composed of an RFID reader and an RFID tag. Because of its ability to identify, trace, and track devices and physical objects, the RFID system is increasingly being used in industries such as logistics, supply chain management, and healthcare service monitoring [1].

Another paper was “integration of wireless sensor network services into other home and industrial networks” in this they discussed about the need and how to integrate wireless sensor networks into other existing IP-based networks. Using the 6LoWPAN it is possible to connect a wireless sensor network with the

internet and other IP-based networks in home and industrial environments. The 6LoWPAN also implements the header compression and fragmentation as well as reassemble of fragments in order to map from IPv6 to ZigBee networks [2].

IMPLEMENTATION

Here the different sensors like fire, gas, mems, and temperature & humidity sensors are used for detect the slight changes in the industries. All the sensors are interfaced through the Arduino Atmega 328. If any sensor detects the faults the then immediately the power supply turned off by the relay. Here relay acts as kill switch

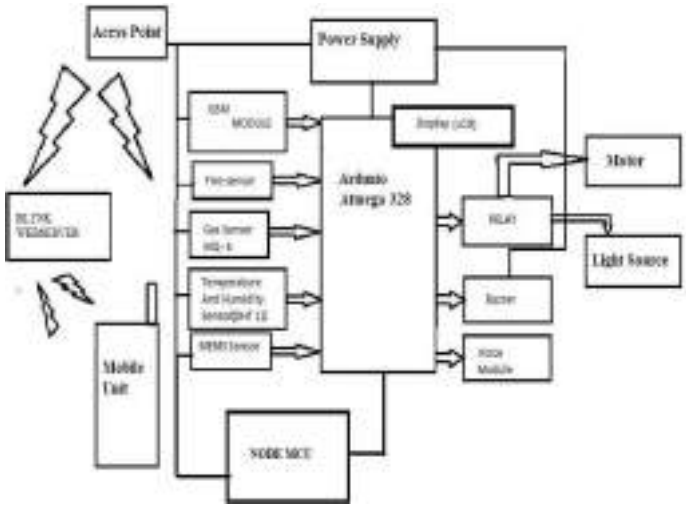

Fig. 1: Block Diagram

whenever things go out of hands its automatically turns off the power supply. Here relay acts as kill switch whenever things go out of hands its automatically turns off the power supply and voice alert is coming from the speaker and buzzer will activated and along with this the GSM is used for sending the messages to the the higher authorities to take approximate measures. For the surrounding peoples the light is placed on top of the industry is turned on which is visible to the surrounding people. This all parameters is live monitored and stored in the blynk software from both pc and mobile. Blynk allows us to create applications and then use it to control Arduino board connected to a PC with internet access, from anywhere in the world, (for instance, controlled, servos, receive data etc.), with a smartphone and a website world, (for instance, controlled, servos, receive data etc.), with a smart phone and a website.

Basically, Blynk are two types

1.Web dashboard

2.Mobile dashboard

IV. RESULTS

This is the hardware output of the project. The figure 3(a) shows the initial condition of the system.

Fig.2: IOT Based Industrial Automation

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Analysis of Slotted Patch Fractal Antenna with DGS for Multiband Applications

[1]Mr. SHAIK SULTAN, [2]K. SIVANI, [3]D. NAGA SRAVANI, [4]G.V.N MANI KRISHNA, [5]A.CHAITANYA SRAVANTHI

[1]Assistant Professor, [2,3,4,5]UG Student, N S Raju Institute of Technology, Visakhapatnam, A.P, India,

[1]sksultan.ece@nsrit.edu.in, [2]18nu1a0423@nsrit.edu.in, [3]18nu1a0411@nsrit.edu.in, [4]18nu1a0415@nsrit.edu.in, [5]18nu1a0403@nsrit.edu.in

Abstract **In this paper the model of Slotted Patch Antenna for Multi Band is developed and analyzed using Defected Ground Structure. This is proposed after designing and simulating using ANSYS High frequency structure simulator (HFSS) software packages based on Finite Element Method (FEM). The proposed antenna consisting of four fractal 'H'-shaped cells applied at the top of the circular patch and the cross section of ground in the structure is reduced with the insertion of circular split ring resonator (CSRR) slots. The performance of the antenna is evaluated using HFSS simulator. The substrate used for the design is ROGER R04003. Therefore, these parametric studies and optimization focus on the enhancement of Gain, Directivity.**

Keywords — Slotted Patch Antenna, Fractal Cell, CSRR Slots, Defected Ground Structure, HFSS,

I. INTRODUCTION

There are number of techniques which have been reported for enhancing the parameters of conventional microstrip antennas, that is, using stacking, different feeding techniques, Frequency Selective Surfaces (FSS), Electromagnetic Band Gap (EBG), Photonic Band Gap (PBG), Metamaterial[2], and so forth. Microwave component with Defected Ground Structure (DGS) has been gained popularity among all the techniques reported for enhancing the parameters due to its simple structural design. Etched slots or defects on the ground plane of microstrip circuits are referred to as Defected Ground Structure. Single or multiple defects on the ground plane may be considered as DGS. Initially DGS was reported for filters underneath the microstrip line. DGS has been used underneath the microstrip line to achieve band-stop characteristics and to suppress higher mode harmonics and mutual coupling. After successful implementation of DGS in the field of filters, now a days DGS[1] is in demand extensively for various applications. This paper presents the evolution and development of DGS. The basic concepts, working principles, and equivalent models of different shapes of DGS are presented[4]. DGS has been used in the field of microstrip antennas for enhancing the bandwidth and gain of microstrip antenna and to suppress the higher mode harmonics, mutual coupling between adjacent element, and cross-polarization for improving the radiation characteristics of the microstrip antenna. Applications of DGS in microwave technology are summarized in this paper and the applications of DGS in the field of antennas are discussed. Low cost, high performance, compact size, wide band, and low-profile antennas often meet the stringent requirements of modern wireless communication systems. Modern communication demands the availability of efficient, compact, and portable devices that can be operated at high data-rates and at low signal power.

In this paper the performance of slotted patch antenna analyzed to investigate in terms of bandwidth, gain, radiation pattern and antenna structure was built on ROGERS R04003 substrate. The relative permittivity of 3.55 and thickness of 0.81mm. The dimensions of the proposed antenna is made of four fractal cells at the top and the ground plane with four CSRR slots.

II. ANTENNA GEOMETRY

For this antenna design the substrate used is ROGER R04003 with a relative permittivity 3.55. The dimension of the substrate are 24mm x 37.5mm x 0.81mm shown in fig.

PARAMETER	DIMENSION(mm)
W_1	24
W_2	4
R_1	4
L_1	37.5
L_2	24
L_3	1
L_4	12

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AGRICULTURAL ROVER BASED ON SOLAR POWER

Dr. B. SIVA PRASAD[1], V.YASWANT SAI PAWAN[2], K.MADHU SREE[3], A.VINAYASREE[4], K.SAI CHARAN RAJU[5]

[1]Associate Professor, [2,3,4,5]U.G. Students
Department of ECE,
NS Raju Institute of Technology,
Sontyam, Visakhapatnam, A.P., India

***Abstract*: In the field of agriculture various problems are faced by farmers in the operations like seed sowing, pesticide spraying, weeding. It takes a lot of time to perform all these tasks and also need different devices to perform these tasks. Thus "Agricultural Rover Based On SolarPower" is designed to execute the various functions simultaneously. The main aim of this paper is increasing the productivityand reducing the man power involved in Agriculture, the agricultural rover starts its function by ploughing the field, then sows the seeds in the ploughed area, waters the area where the seeds were sown and also cuts the weed. The functioning of the rover can be operated through Bluetooth.**

***Keywords*: Arduino UNO, Solar Panel, Bluetooth Module, Relay Module, Motor Driver Circuit, Battery.**

INTRODUCTION

Our whole economy is based on agriculture. So, it is necessary to make some advancement in this field. Today's agricultural field demands to find new ways of agricultural operation to improve performance efficiency. In the field of agriculture various problems are faced by the farmers in the operations like ploughing, seed sowing, and pesticide spraying, watering, and weeding. Also the equipment used to perform these operations are very heavy.

Nowadays robots are used in various sectors. We can make the use of available technologies and the robotics technology in the farming system to reduce the efforts of farmersand also to reduce time, energy and required cost. Hence, there is a greater need for multiplecropping in the farms and time saving machines. This project helps in different types of seed sowing machines. Watering, ploughing and also cutting the unwanted weed will be done by this project which will be helpful for the agriculture industry to move towards mechanization.

OBJECTIVE

By observing all the above point into considerations, thus agricultural rover machineis designed which can do complete agriculture work automatically without manpower requirement and which is tractor independent. Since the aim of the project is to create an ecofriendly machine. This implements simple mechanism which is operated by the microcontroller. Since there is no requirement of tractor so cost of production is also reduces. Since the machine cannot use any fuel, it cannot cause any pollution thus ecofriendly. This machine can revolutionize the present dayagriculture. Further many more modifications which completely automate the whole agriculture work and the machine simply work like a rover.

LITERATURE REVIEW

The main objective of autonomous agribot is efficient utilization of resources and to reduce labor work. It can perform various tasks like soil testing, sowing of seeds, spraying of fertilizers and harvesting of fruits. It can measure the NPK content of soil using color testing of chemical solution using fiber optic and dispense the required amount of fertilizers which is necessary or less in soil. It can dig a hole in soil by drilling mechanisms and plants seed and cover hole by soil again. It can spray the pesticides using spraying mechanisms. All above operations are performed by usingArduino controller which is master and others are lily pad which are slaves performs specific operation. By using image processing and robotic arm the agribot will detect fruits on treeand cut the fruit and dump it on basket. [1]

Agribot is a robot designed for agricultural purposes. It is designed to minimize the labor of farmers in addition to increasing the speed and accuracy of the work. It performs the elementary functions involved in farming i.e. ploughing the field, sowing of seeds and covering the seeds with soil. It uses controller, LM293D IC is a typical Motor Driver IC which allows the DC motor to drive on any direction, DC motor for digging. The robot is autonomous and provides the facility for optional switching of the ploughing system when required. PSoC (Programmable System on Chip) controller from Cypress Semiconductor, USA is used to control the robot. [2]

Mango cultivation methods being adopted currently are ineffective and low productive despite consuming huge man power. Advancements in robust unmanned aerial vehicles (UAV's), high sp d image processing algorithms and machine vision techniques, reinforce the possibility of transforming agricultural scenario to modernitywithin prevailing time and energy constraints. Present paper introduces Agricultural Aid for Mango cutting (AAM), a Agribot that could be employed for precision mango farming. It is a quadcopter empowered withvision and cutter systems complemented with necessary ancillaries. It could hover

around the trees, detect the ripe mangoes, cut and collect them. Paper also sheds light on the available Agribots that have mostly been limited to the research labs. AAM robot is the first of its kindthat once implemented could pave way to the next generation Agribots capable of increasing the agricultural productivity and justify the existence of intelligent machines.[3]

IMPLEMENTATION

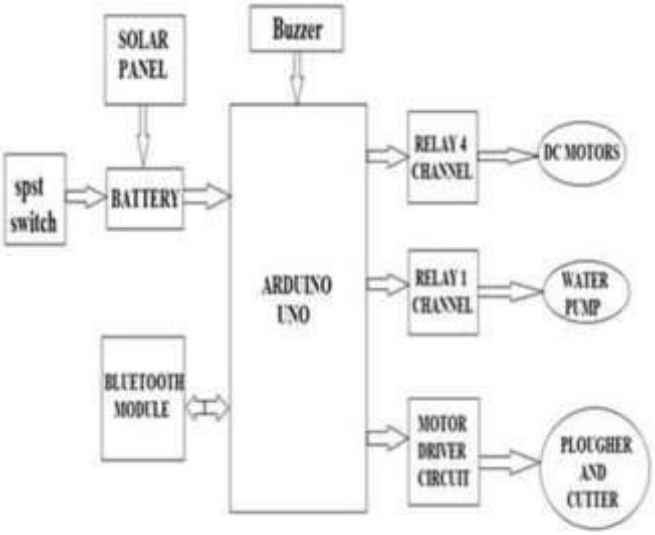

Fig. 2.1: Block Diagram Of Agricultural Rover Based on Solar Power

In this paper we have used solar energy by which the rover works. The Agri rover starts itsfunction by ploughing the field, then sows the seeds in the ploughed area and at last waters the area. It also does the work of cutting the unwanted plants. It is programmed to carry out the above functions simultaneously. The Agri rover is capable of doing multi-tasks and this can be said that it is a reconfigurable robot.

RESULT

Fig. 2: Agricultural Rover Prototype FrontView and Back View

The design of hardware components is doneand processed by Arduino UNO.

SMART CART WITH AUTOMATED BILLING

K.Y.K.G. R SRINIVASU[1], V.R.V.S.KARTHIK[2], V.SAI PREETHI[3], R. TEJA[4], P JYOTHI[5]

[1]Assistant Professor, [2,3,4,5]U.G. Scholars
Department of ECE,
N S RAJU INSTITUTE OF TECHNOLOGY,
SONTYAM, VISAKHAPATNAM, A.P, INDIA

***Abstract*: Now a days shopping is one of the most fascinating and alluring things. At the very same time, it involves getting tired due to standing in a long queue for the bill and payment process. At billing counter, they get confused while comparing the total price of all the products with the budget in the pocket before billing. To overcome these problems, we have designed a Smart Cart using an Arduino. Each shopping cart is implemented with a Product Identification Device (PID) that contains a microcontroller, an LCD, LDR Module, RFID reader, Bluetooth module and Push buttons. Here each item consists of a RFID tag and each item is scanned with the help of RFID reader before dropping into the cart. There is a chance to revert the product depending on our need and budget. This can be done by using a push button. If the item is not scanned and is dropped into the cart, an alert is given through the buzzer. This is done with the help of LDR module and Laser diode. The total bill and the number of items will be displayed on the LCD once we are done with shopping and the total bill will be sent to the android device with the help of the Bluetooth module.**

***Keywords*: Arduino Uno, Rfid reader, Rfid tags, Bluetooth module, LCD, Laser, Buzzer, pushbutton.**

1. INTRODUCTION

In this era of multiplexes and malls, we face huge rush and crowd while we go for shopping. The purpose of this innovation is to improve upon the conventional method of shopping by making it simple and fast. People generally spend most of their time in shopping. So, we need to make this process of shopping simpler and more efficient.

The purpose of supermarket is to provide availability of all products and save the time of the customers who are getting frustrated while waiting in the queue at the billing counter and sometimes they get confused while comparing the total prices of all the products with the budget in the pockets before billing. Sometimes, even the products in the cart or trolley gets misplaced while scanning, the products might get scanned several times at the billing counter. While shopping, cart plays an important role to carry all the items. After selecting all the items, we go to the billing counter and have to wait in long queue for our turn. So, to overcome this problem we designed this product.

This product is based on Embedded System Design. It uses an RFID-RC522 Module to read the products in the supermarket. The module is interfaced with Arduino-UNO. The LCD displays the total amount and total number of products. The receipt of the total bill is directly sent to the Android device through the Bluetooth module HC-05. II.

II. LITERATURE SURVEY

Developing a 'Multitasking Shopping Trolley Based on RFID Technology RFID (radiofrequency identification) International Journal of Soft Computing and Engineering, Vol.3, No.6, pp.179-183.2014[1] technology offers the ability to provide many new services and conveniences in the retail environment. RFID tags, or simply "tags", are small transponders that respond to queries from a reader by wirelessly transmitting a serial number or similar identifier. RFID is the special type wireless card which has inbuilt the embedded chip along with loop antenna. The inbuilt embedded chip represents the 12-digit card number. RFID reader is the circuit which generates 125KHZ magnetic signal. This magnetic signal is transmitted by the loop antenna connected along with this circuit which is used to read the RFID card number. RFID reader is interfaced with microcontroller. Here the microcontroller is the flash type reprogrammable microcontroller in which we already programmed with card number. The microcontroller is interfaced with keypad.

S.Sojitral and RG Patel, "A Review of Smart Shopping Systems", International Research Journal of Engineering and Technology,(Vol. 3, No.5, pp. 2561-2563, 2016) [2] The idea is to decode the QR codes, thereby launching a URL in the web browser. This is because in today's retail environment, products come with label tags for unique identification and theft protection. This in turn gives rise to in-store marketing and access to information. The impact of IoT comes in the case of mobile payment where by enabling NFC, one may get access to systems and virtual wallets. Components like microcontroller, an RFID reader, EEPROM, LCD and ZigBee module, is designed with a Product Identification Device (PID). RFID reader enables reading product information associated with the product being purchased. Meanwhile, EEPROM stores the product information attached to it and the data is sent to Central System for billing via ZigBee module. Central system gets access to information like the cart and EEPROM data, thereby allowing easy calculation of payment amount. trolley equipped with NFC reader display is suggested to maintain running total. In addition to this, use of IoT to connect all trolleys with the central server and providing provision of online payment would add more positivity to shopping experience suggested.

Smart trolley billing system using Arduino by Sridhar Mahad International Research Journal of Engineering and Technology, (Vol. 2, No.5, pp. 1562-2583, 2016) [3] the concept is designed into a smaller version of the automated self-checkout system on a shopping trolley with a user interface screen which allows customers to make payment for items scanned and placed

IV. RESULTS

Figure 2. Smart cart

The design of hardware components is done and processed by Arduino UNO. The software implementation is by Arduino IDE tool. Here are the figures of the results.

Figure 3. Bill Generation in Android Device

V. CONCLUSION & FUTURE SCOPE

5.1 Conclusion

In this thesis the project Smart Cart with Automated Billing has been successfully designed and tested. Integrating features of all the hardware components used have developed it. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. The smart trolley system is very efficient for both customers as well as the shop owners. This system is robust and consistent. People always wanted to buy new stuffs to satisfy their needs; however, some people hate it mainly because of the crowd, long queues in the shop, billing, etc. In a big shopping mall, it is very difficult to search for a particular product. In light of these, the smart trolley seems to be a better alternative for all these woos. This is mainly to ease the shopping, to invite more customers, to make shopping a fun and mainly to save time. Moreover, customers manage their shopping details online and remain connected with the shop owners for any queries or suggestions and also make the billing perfectly online. This is to ease the shopping for customers and to reduce the number of workers in the shop to save money to the shop keeper.

5.2 Future Scope

In future, this system can be improved further by providing face recognition instead of smart cards. By this, all are stored in RFID tags to store data. This makes the customer come to the shop and take a trolley and do all purchasing and can walk out of the door. There is no need of customer's smart card. The bill will be sent to his mail id, and money can be deducted directly from the customer's bank account by paying it with the help of the QR code attached to the cart. However, smart trolley can be improved in security aspect also by providing consumers privacy and it must guarantee secure online transaction

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Power and Delay Optimization of 8-Bit ALU using Various Techniques

Ch. Shivaji*
Asst. Professor,
Department of ECE, N S RAJU Institute of Technology,
Visakhapatnam, A.P, India.

G.V.V. Vamsi
U.G.Scholor,
Department of ECE, N S RAJU Institute of Technology,
Visakhapatnam, A.P, India.

G. Harsha Priya
U.G.Scholor,
Department of ECE, N S RAJU Institute of Technology,
Visakhapatnam, A.P, India.

K. Gayathri Devi
U.G.Scholor,,
Department of ECE, N S RAJU Institute of Technology,
Visakhapatnam, A.P, India.

J. Roja Ramani
U.G.Scholor ,
Department of ECE, N S RAJU Institute of Technology,
Visakhapatnam, A.P, India.

Abstract: **The Arithmetic Logic Unit (ALU) is used in many applications such as Digital image processing, microprocessors and Digital Signal Processing. In this paper we designed the 8-bit ALU by using various Techniques like CMOS, TG (Transmission Gate), GDI (Gate Diffusion Input), M-GDI (Modified Gate Diffusion Input), FS- GDI (Full Swing Gate Diffusion Input) Techniques and compare the power, delay and power delay product of 8-bit ALU by using the mentor graphics tool with 90nm CMOS technology with the minimum supply voltage of 1.2V and frequency of 125Mhz.**

Keywords: CMOS, Transmission gates (TG), Gate Diffusion Input (GDI), Modified Gate Diffusion Input (M-GDI), Full Swing Gate Diffusion Input (FS-GDI).

I. INTRODUCTION

An Arithmetic Logic Unit (ALU) is brain of the Central Processing Unit (CPU), which accomplish Arithmetic functions like addition, subtraction, multiplication, division and logical functions like AND, OR, XOR etc. To design an ALU full adder plays an important role which performs arithmetic operations. If there is any change in full adder then there is automatic improvement in the ALU. Power consumption and Delay are the major issues in electronics industry which triggered research efforts to reduce the Power consumption and Delay of the VLSI circuits, there is only a limited amount of power available for portable electronic devices widely used on daily basis, these electronic devices are high speed low power VLSI circuits works simultaneously. Gate Diffusion Input Techniques (GDI, M-GDI, and FS-GDI) was introduced a promising alternative to static CMOS logic and Transmission Gate logic. GDI Techniques reduces transistors count, Power and Delay issues of VLSI circuits.

II. LITERATURE SURVEY

A large body of investigation has been performed to expand and advance conventional Complementary Metal Oxide Semiconductor (CMOS) techniques for the fabrication of ULTRA low power integrated circuits (ICs). The purpose of this study is to expand a faster, lower power, and reduced area substitute to standard CMOS logic circuits. M-GDI technique is one such new technique for minimization of powerconsumption in the digital circuit design field.

Power dissipation becomes most important restriction in high performance applications. Optimizations for basic logic gates are fundamental constraint in order to get better the performance of a variety of low power and high-performance devices. Morgenshtein et al. investigated a high-speed and multipurpose logic style for low power electronics design, known as Gate Diffusion Input (GDI), with reduced area and power necessities, and proficient of implementing a broad variety of logic functions.

The arithmetic logic unit (ALU) is the core of a CPU in a computer. The adder cell is the elementary unit of an ALU. The constraints the adder has to satisfy are area, power and speed requirements. Some of the conventional types of adders are ripple- carry adder, carry-look ahead adder, carry-skip adder and Manchester carry chain adder.

III. EXISTING TECHNIQUES

1.1 CMOS Logic

CMOS or Complementary Metal Oxide Semiconductor is a combination of NMOS and PMOS transistors that operates under the applied electrical field. The structure of CMOS was initially developed for high density and low power logic gates. The NMOS and PMOS are the types of Metal Oxide Semiconductor Field Effect Transistors (MOSFET). The CMOS transistors are used in various applications, such as amplifiers, switching circuits, logic circuits, Integrated circuit chips, microprocessors, etc. The importance of CMOS in semiconductor technology is its low power dissipation and low operating currents. Its manufacturing requires fewer steps as compared to the Bipolar Junction transistors.

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RFID Based Automatic Toll Collection Systemfor Dynamic Charging Vehicles

S.JAYA RAJU[1] , K.LEELA SAI KOTESWARI[2] , K.G.DEEPIKA[3] , N.KAVYA[4] , P.SAI TEJA[5]

Asst. Professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY,SONTYAM, VISAKHAPATNAM, A.P, INDIA
U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY,SONTYAM, VISAKHAPTNAM, A.P., INDIA

ABSTRACT
In order to find a solution to stop and wait charge for electric vehicles and also to maintain transparency in toll gate system, we are providing automatic toll collection for electric vehicles which are using wireless power generating track. Thus by providing continuous charging path that allows the vehicle to charge continuously while it is in motion and it maintaining transparency in tollgate system by scanning RFID tags under RFID sensor, hence
the name RFID based automatic toll collection system for dynamic charging vehicles is introduced. This project focuses on automatic toll collection system which uses radio frequency identification (RFID) technology to identify a vehicle specifically for collecting toll. The proposed RFID system uses tags which are using the tag numbers as vehicle plate numbers of electric vehicles through which information embedded in the tags are read by RFID readers. It is possible to reduce the need for manual toll collection, also saves the time at toll gates and also helps the electric vehicles to get charge when they are in motion. For providing dynamic wireless electric vehicle charging we are using copper coils beneath the track, the track will generate wireless power to the electrical vehicles so that the vehicle uses wireless power for charging purpose while it is in motion. The track gets charging by an external battery and this external battery gets charged using solar energy.so that we can reduce the usage of petrol, diesel and other fossil fuels and we can also save the environment by reducing the usage of greenhousegases and also reduce global warming effect.
Keywords: *Arduino UNO, LCD, Push Button, Relay, RFID Sensor, LC Tank circuit, RFIDtags, servo motor.*

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I. INTRODUCTION

In the present scenario as the technology become advanced the usage of vehicles for transportation also involved to change i.e., they are shifting to the usage of electric vehicles. As these electric vehicles need charging stations for charging purpose it will take some time to stop and charge. For establishing these charging stations to power up the electric vehicles we require charging stations and it takes time to Charge the vehicle. The problem with electrically charged vehicles is, they can be charged only when they are in stationary mode and they are charged only for short distance and range. They don't have sufficient volume of battery storage also. So, we are going with dynamic vehicle charging which charges the vehicle when it is in motion. So, providing dynamic charging to the electric vehicle through transmitting coils which are mounted underneath the track is a better solution to avoid bulky battery structures, shorter range problem, and limited power transfer issue. In this proposed system RFID reader will read the RFID tags by taking the tag number as vehicle plate number and then it will either give access or it won't allow any electric vehicle to use that wireless power generation track. This process will entirely depend on database of the tag. As there is no need for vehicles to stop and toll authorities to manually collect the tolls, the system eliminates the traffic jam and possible human errors that normally happen in a toll system making it a more efficient process. The wireless power generating track will also be helpful and useful in reducing the usage of fossil fuels and also reduces the emission of greenhouse gases. This wireless power generating track will receive power from natural source of energy i.e., solar energy which is environmentally friendly without causing any pollution.

II. LITERATURE SURVEY

In this system the ideology can drain the prevalent botheration of bouncing the audit action at the check-posts and also decrease the pausing time, fuel burning of all vehicle in thetoll-plaza, due to self-regulated checking and automatic detection of tax amount. The crime vehicle can be discovered when a grievance had

IV. RESULTS

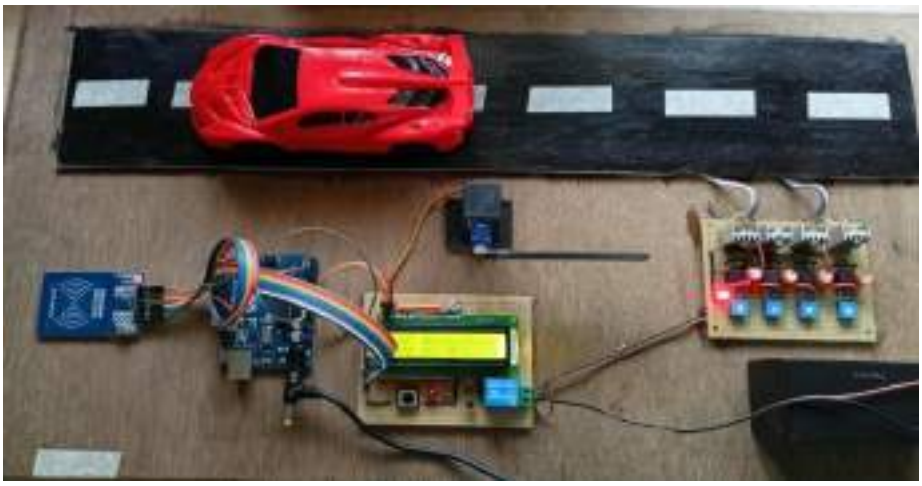

Figure 2: RFID Based Automatic Toll Collection System for Dynamic Charging Vehicles

In this project the automatic toll collection system which is based on RFID sensor gives access to the electric vehicles only which are authorized and denies the access for unauthorized vehicles .This can be possible only by using RFID tags at toll gate systems .This toll gate system is especially for electric vehicles which are going to use wireless charging i.e., dynamic vehicle charging .Hence the name RFID based automatic toll collection for dynamic charging vehicles.

V. CONCLUSION & FUTURE SCOPE

5.1 Conclusion

The system which is introduced can be used to develop a completely digital and smart toll collection system for electric vehicles as it provides automatic toll collection system only for the electric vehicles which are using dynamic charging track through dynamic wireless charging system. In our country, manual toll plaza causes a lot of traffic as it involves manual toll collection. Besides, corruption in the toll plaza is an open secret. This toll collection system can solve these problems efficiently. This RFID based toll collection system mainly depends on the RFID tags and RFID sensors. As a result, it will not only save the valuable time but also eliminates the corruption in the toll plaza and also eliminates stop and wait charge problem by providing wireless power to the track so that the electrical vehicle gets charging when it is motion. By using this wireless power generating track it will save the time for charging and also reduces bulk battery structures which are required for travelling long distances. By using this system it simply provides automatic toll collection for dynamic charging vehicles. It reduces the risk of range and recharging for the electric vehicles which are travelling for long distances without the need of static charge and also the setup of bulk battery structures.

5.2 Future Scope

Moreover, in future using this system can reduce green house gases and also we can reduce emission of harmful gases from vehicles by using electrical vehicles. Also we can use renewable source of energy i.e., solar energy to generate wireless power to provide wireless charging to the track .so that is becomes easy for the electrically charged vehicles to get charged while they are in motion and no need to stop and wait for charging. Here the implemented toll gate system helps to save time for the paying tolls and also it will helps in tracking information about the particular vehicles which are using this dynamic charging track. But the problem with this system is .For the entire track power will be wasted even if a single vehicle is present on that track. So, in future it will be recovered by using the IR sensors concept. By using IR sensors we can activate only front and back coils of the track as the track will have coils beneath it .So only front and back coils in which the vehicle is present on the track are activated

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Smart Helmet for Accident Avoidance

Dr. B. SIVA PRASAD[1], Y. HARIKA [2], A. KARTHIK[3], G. RAMESH[4], T. VIJAYA BHASKARA VARMA[5]

Associate Professor, Department of ECE, N S Raju Institute of Technology, Sontyam, Visakhapatnam, A.P., India

U.G. Students, Department of E.C.E., N S Raju Institute of Technology, Sontyam, Visakhapatnam, A.P., India

Abstract— *From over the past decades the road accidents are increasing day by day in the country. Due to the fact, that the riders are not wearing the helmet and also the consumption of alcohol while riding the bike is another major cause which leads to the road accidents. This results in loss of human lives. In order to overcome these problems, this project work proposes a device called "SMART HELMET". The switch or touch sensor checks whether the person is wearing the helmet or not. The alcohol sensor which recognizes the alcoholic content in the riders breathe. If the person is not wearing the helmet and also consumes the alcohol, then the bike will not start. If there is no alcohol content present and helmet is used then only the bike will start. Here when the rider met with an accident, the sensor recognizes the condition of motorbike and reports the accident. Then the G.P.S in the bike unit will send the location of the accident place to the registered number or to the nearby hospitals. It will provide a safer travel for bikers and help them in case of emergency.*

Keywords—*Arduino Uno, NEO 6-M G.P.S, MPU 6050, RF Modules, Relay Module, DC Motor, G.S.M SIM 900A, Alcohol Sensor, MQ-3 Gas Sensor, Micro Switch*

Date of Submission: 29-05-2022 Date of acceptance: 10-06-2022

I. Introduction

In a highly populated and developing nations like India, which has a huge number of road accidents every year. The most effective means of road transport is through bike because of low cost and simplicity. But these Bikes are one of the most unsafe means of road transportation. The major road accidents that we come across is because of two-wheeler road accidents. The accidents mainly occur due to many reasons like drunk and driving, driving rashly, over speeding, leaving hands while driving for fun, etc.

Now-a-days wearing helmet is compulsory for bike riders, but the inconvenience which causes due to wearing of helmet make the rider to stop (or) avoid the usage of helmet and which finally leads to death of rider. In Many accidents the riders get injured mainly on the head. So, a helmet plays a very important role in saving the life of a rider. A design is proposed that synchronizes with the module present on helmet. if a rider is not wearing the helmet and wants to start a bike, it won't start. The rider must and should wear the helmet in order to start the bike. The MQ-3 alcohol sensor detects the alcohol content in the rider's breath. So, even though the rider consumes alcohol and wears the helmet, the bike won't start. So, the rider must wear the helmet and should not consume alcohol then only the bike will start.

Even though the police are continuously working day in and day out still two wheelers accidents are continuously increasing. This project aims on reducing accidents by making the rider drive carefully and safely. In case of an accident happens, the G.P.S and the G.S.M module sends messages with the location of rider to emergency contacts Ease of Use

II. Literature Survey

Several researchers have worked on this problem using various methods

Nataraja proposed a system that checks whether a helmet is worn or not by using an IR sensor. The project contains a helmet module and vehicle module which communicate via RF communication. The system is also capable of accident detection, signboard detection, and alcohol detection.

Shikha Gupta developed a smart helmet that was IOT enabled and was capable of performing alcohol detection and accident detection. The system is GSM and GPS enabled which sends messages in case of accidents. Features like live location tracking and a camera for recording in case of accidents are also present. The whole system is mounted on top of the helmet.

Vimal Jyothi Engineering College, Kannur, India, have shown the collision detection using an Arduino Uno; and the message is delivered using a Router and GSM modem. They mention "It consist of a GPS receiver, GSM modem, Arduino using ATMEGA 328 IC, vibration sensors, buzzer and a power supply system. The heart

of the system is the Arduino uno board, which controls all other blocks in this system." Further they also mention "it takes the value of latitude and longitude from the GPS receiver and transfer it to the pre-programmed mobile number via SMS through GSM modem. And it operates the audio alarm."

Archana had proposed a system which will not allow driver to start the engine without wearing the helmet. When rider wore the helmet, helmet will be locked and engine will be switched ON. This system also identifies the approaching vehicle's speed on both sides of the bike while riding by using ultrasonic sensor and alert the rider by generating vibrations in bike's handlebar.

III. Implementation

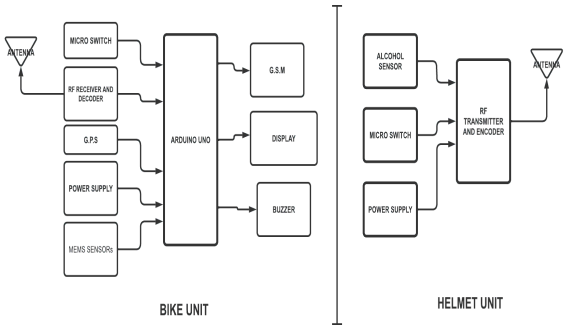


Fig. 1: Block Diagram

The block diagram of the Smart Helmet using is shown in above figure 2.1. It consists of two sections, those are Helmet section and Bike section. Here at first at the Bike section, the RF Receiver is in waiting state for a signal from Helmet section along with Arduino UNO, buzzer, led display, relay module, ignition lock and at Helmet section it consists of RF Transmitter, Alcohol sensor, Batteries and a micro switch

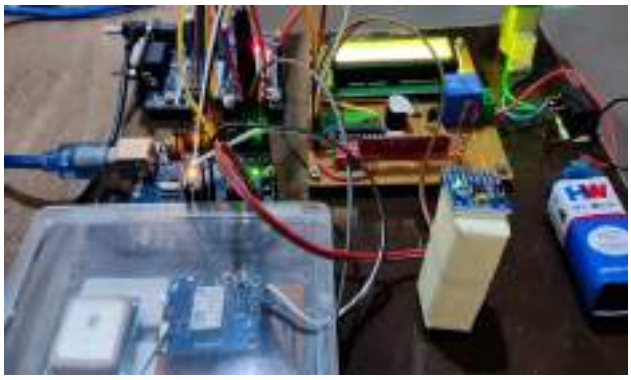


Fig. 2: Bike Circuit Unit

Here when the user wears the helmet in order to ride the bike, the alcohol sensor and micro switch will check whether the conditions to start a bike have met or not. Here the micro switch will detects/checks whether the use is wearing the helmet or not and alcohol sensor will detect whether the user is drunk or not. After collecting this data, it is sent to Bike unit by RF Transmitter.

Fig. 3: Helmet Circuit Unit

EMERGENCY ALERT SYSTEM FOR DISABLED PEOPLE USING HAND GESTURES AND GSM

V.ASWANI[1], D.ANEESHA[2], AJITH PANDA[3], K.USHASRI[4], G.LOKESWARI[5]

[1]Assistant Professor, [2,3,4,5]U.G. Scholars
Department of ECE,
N S RAJU INSTITUTE OF TECHNOLOGY,
SONTYAM, VISAKHAPATNAM, A.P, INDIA

***Abstract*: Now a days we are facing many problems to communicate with disabled people because normal peoples are not trained with hand gestures. There are almost 30% of disabled people in the world. So it's very difficult to communicate with normal people. So to overcome these problems speaking systems were implemented but they are having some drawbacks. They were implemented a hand glove with inbuilt flex sensor and the movement of hand gesture will be captured and it will be compared with previously stored information. But by using this there is a problem i.e., because of using a flex sensor multiple times the density of the flex will be decreases. Hence we will be getting some errors and the output may not be accurate. So we are implementing a new model using MEMS sensor the output of the people will be given to the MEMS and the content will be compared with voice module which is previously recorded and the output will be displayed in LCD and also in the speaker. And GSM module is interfaced for emergency purpose by using push button. If we operate the push button then the message will be sent to the previous recorded numbers saying that they are in some need. So the alert will be given to that particular person and buzzer will be on.**

Keywords: Arduino mega, 8channel voice playback module, speaker, LCD, relay, bulb, GSM module, pushbutton.

1. INTRODUCTION:

Having difficulties like being visually impaired, hard of hearing, disabled are a greater amount of concern. As indicated by the World Health Organization, around 285 million individuals on the planet are visually impaired, 300 million are hard of hearing and 1 million are mute and 9.1 billion peoples are disabled. In everyday life communication is a serious issue for the disabled people. It's very difficult for the disabled people to convey their message to regular people. Since regular people are not trained on hand sign language, the communication becomes very difficult. In emergency or other times when a disabled people among new people communication with nearby people or conveying a message becomes very difficult.

The gestures created by the disabled person are difficult to understand. Sign language is a language which is used for communication between the normal people and disabled people. Sign language relies on sign patterns, i.e., body language, orientation and movements of the arm to facilitate understanding between people. In their day to day life they faced lot of problems on their communication. This paper is described to reduce the communication gap between the normal people and disabled people. The sign language is based on the hand gestures. Gesture is defined as an expressive movement of body parts. The collection of data can be stored on the controller. The data processing unit is used to perform the controlling and transferring function.

Two MEMS sensors are used in this paper, it generate eight outputs. By operating one MEMS sensor will get a basic needs i.e. food, medicine, water, etc. as output through speaker. The other MEMS sensor is used to operate light and fan and the output will be displayed in LCD. For the emergency purpose we are using push button and GSM module. If in case of any emergency situation by operating a pushbutton buzzer and GSM will be activated. By using GSM, SMS will be send to the particular person.

II. LITERATURE SURVEY

In this research of designing a system that will help disabled people to communicate in our surroundings. This research proposal is based on a very simple concept whereby we need to have a means for capturing the sign languages available in order to utilize International Journal of Engineering Research And Advanced Technology, Vol.5, Issue 8, August-2019 www.ijerat.com Page 27 DOI: 10.31695/IJERAT.2019.3491 them to solve the presented problem above, meaning using to translate them into speech so that voice impaired people can communicate. As a precursor to this research there have been many research involving simply of communication to disabled people. For example, in the research of Sign language, a language through which communication is possible without the means of acoustic sounds. Also is an effective tool that allows disabled people to communicate with their non-mute counterpart. However, hand gestures are still not the most natural mode of communication and unmute people still find it difficult to adapt to audio-less communication [1].

As well as in the research of electronic voice to disabled people using flex sensor, a system facilitates individuals by means of a glove based mostly disabled communication interpreter system. The glove is internally equipped with four flex sensors. For every specific gesture, the flex detector produces a proportional amendment in resistance and measures the orientation of hand. The process of those hand gestures is finished in controller. The glove includes 2 modes of operation- coaching mode to learn of each user associate degree an operational mode. The concatenation of letters to create words is additionally drained controller.

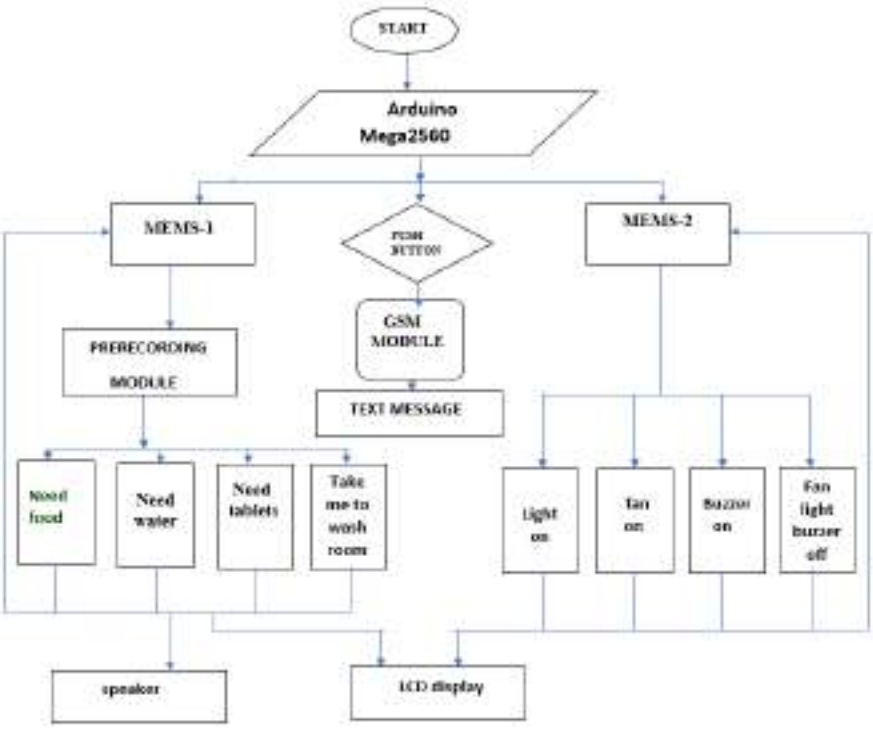
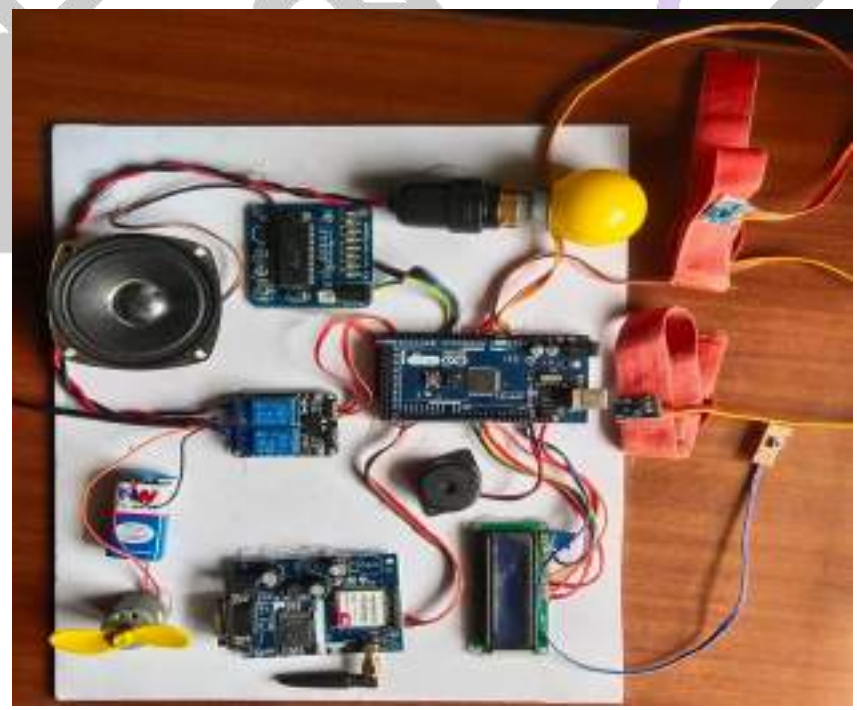


Figure 2. Flowchart Diagram

An emergency buzzer will be activated by operating the push button, also TEXT message will be sent through GSM module form the registered SIM to the given mobile numbers in the code. The buzzer will be in active position until the text message will be received by first registered mobile number.

IV. RESULTS



The design of hardware components are done and processed by Arduino mega2560. The software implementation is by Arduino IDE tool. Here are the figures of the results.

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Railway Track Crack & ObjectDetection Using GSM & GPS

Dr. K. RAVI KUMAR[1], G. JAYA SREE[2], V. MANOHAR[3], G. VENU VARDHAN[4]

[1]*Professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA*
[2,3,4] *U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPTNAM, A.P,INDIA*

Abstract *- The main cause of the accidents happened in railways are railway track crossing and unrevealed crack in railway tracks. Nowadays in Indian railways they use manual system for tracking the cracks in the railways but this process will leads to take more time for detecting the cracks. Therefore, there is a need to have new technology which will be robust, efficient and stable for both crack detection as well as object detection. This paper discusses a Railway track crack & object detection using sensors, it is a dynamic approach which combines the use of GPS tracking system to send alert messages and the geographical coordinate of location.*

Keywords — GSM, GPS Module, Arduino Microcontroller, IR sensor, Ultrasonic sensor.

Date of Submission: 07-06-2022 Date of acceptance: 22-06-2022

I. INTRODUCTION

To test the cracks in railway tracks, communication, and identification using GPS module, GSM modem and IR sensor and PIR sensor. The GPS module and GSM modem were utilized to identify and transmit railway geometric parameters related to crack detection to a nearby railway station. The PIR sensor is used to detect moving objects crossing railroad tracks. This device may work both at night and during the day [1]. The proposed broken rail detection system automatically detects the faulty rail track without any human intervention. This paper proposes a cost effective solution to the problem of railway track crack detection utilizing LED-LDR assembly which tracks the exact location of faulty track which then mended immediately so that many lives will be saved [2]. This system is proposed for detecting railway track cracks using image processing. this method is used for both crack detection in railway tracks and object detection, a new method that is robust, efficient, and steady has been developed. This study presents a system for detecting defective train tracks and objects. It's a dynamic strategy that combines the usage of a GPS tracking system and a WIFI module to transmit alert messages and the location's geographical coordinates. To control and coordinate the operations of various devices, a Raspberry Pi 3 is employed [3]. This system is designed to find the cracks Using an op amp anda microcontroller, the suggested system provides a simple approach for detecting railway track cracks. The SMS is also sent to the main branch via GSM. The operation of his system includes when we apply reference voltage it gives predefined voltage when there is no crack detected or if any crack detected then the voltage levels will regulate and the op-amp output will be given to microcontroller, and the information will be sent through GSM module using software which is designed in vb6.0. at the end of the software can find out the location of the crack. Along with this there is an led used for indication purpose it will change its color from green to red when crack is detected [4]. In this paper they use IR sensors for detection of the crack in railway tracks. Whenever the crack is detected based on its latitude and longitude values the message will send to mobile phone. Then IR sensor is used for the detection purpose. This system is designed using Arduino Uno (ATmega328), IR sensors and Bluetooth to perform railway safety monitoring system. Here an IP based camera is also used for monitoring visual videos captured and photos captured from the railway tracks [5].

In this paper discusses a Railway track crack detection and object detection using IR sensors & Ultrasonic sensors. Whenever any crack or object detected and on the track buzzer sound will be generated and the sensor will send the information to the controller, then controller processes the whole information and it gets the location of crack or object using GPS and sends the detection SMS to the authority mobile numbers using GSM. For driving the robot on the railway track we here we are using DC motors and L293D Motor driver. So by using this robot we can reduce the accidents to a great extent and can prevent not only the loss of precious lives and can save the property as well.

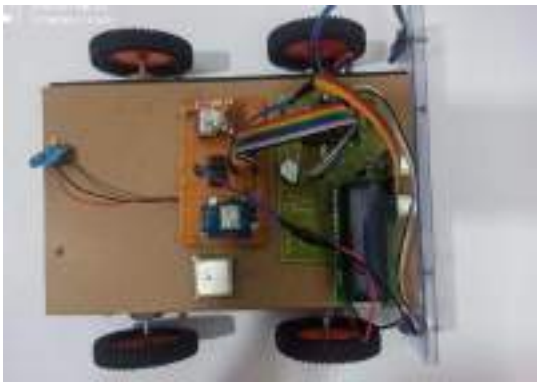

Fig. 2: Final Result

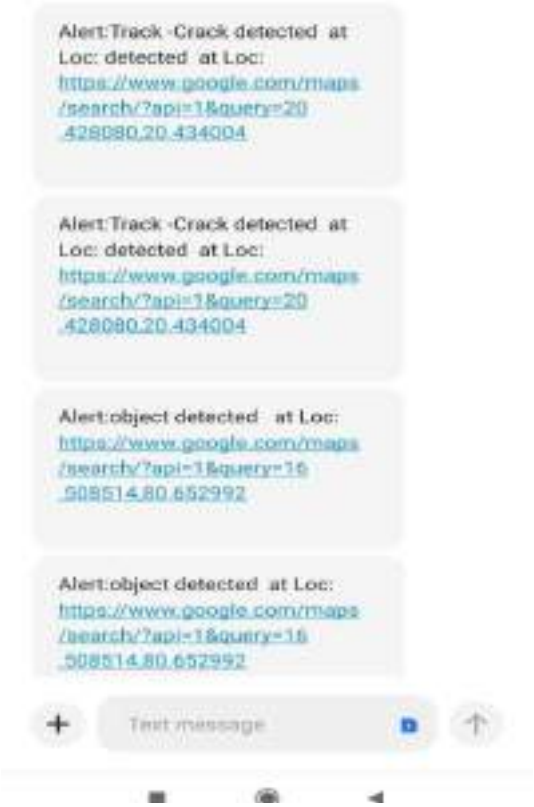

Fig. 3: Message to the authority numbers after detection of crack and object

IV. CONCLUSION

In order to improve the safety for transportation in railways this robot will help efficiently, which facilitates better safety standards of railway tracks for reducing rail accidents due to unrelieved cracks and obstacle on railway tracks. This robot is designed not only to detect cracks and objects but to work efficiently and accurately which leads to reduce the time and provides better results. this robot will help to find out the cracks and objects and the information of detection will be forwarded to the authority mobile numbers quickly By using GPS it will get the exact location of the crack or object and sends the message using GSM, and the buzzer will produce a beep sound whenever the crack or object detected. So by implementing this robotic vehicle will avoid accidents to a great extent and can save many human lives.

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Design of Smart Bus Fare Collection System Using RFID

M.V.S. ROJA RAMANI[1], P.B.S.S.K. SWETHA[2], P. SREEBAMA. V[3], A. RAMKUMAR[4], S. RAMESH NAIDU[5]

Associate professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P. INDIA
U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P. INDIA

ABSTRACT: *Now-a-days in public transportation we are facing too many problems with ticket fare collection. There are almost 65% of the public using the public transportation for their daily works. So, to overcome these issues a smart fare collection system is to be implemented. In this paper we have implemented the smart bus fare collection system using RFID module. The passenger's details and the amount is stored in the RFID tags allocated to each user. The GSM modem is used to send the information to the user's registered mobile. All the inputs and details are displayed on the LCD display for the user's verification at that instant.*
KEYWORDS: *Arduino UNO, RFID tags, RFID module, GSM modem, keypads and LCD display.*

Date of Submission: 26-05-2022 Date of acceptance: 08-06-2022

I.INTRODUCTION

The journey in the public transports is very difficult, noisy and are corrupted. Around 65% of the public transports are bus transportation and almost complete population use these transportations for their works. The paper-based ticketing system which is used is not reusable and also is time consuming. So, the public transportation system needs to be smart. To avoid this paper-based ticketing, the time consumed and also the corruption the designing of smart bus fare collection system is needed to be implemented. A database is created in this project which is used to hold unique RFID Card number issued to a passenger. The passenger's count is read by the driver through his RFID. After calculating distance, the amount is deducted from passenger's account. RFID cards and reader is used to read card number which is send to database and fair amount is deducted from person's account.

II. LITERATURE SURVEY

Literature review was carried out throughout whole project to gain knowledge and skills needed to make this project. In paper [1] the authors explained the advantages of RFID cards about its low cost, it also explains how a RFID Reader will be there in the bus which is connected to main server which is used for automatic fare collection. In paper [2] the fare is automatically deducted according to distance travelled using GPS in the system. A database is created which is used to hold unique RFID Card number issued to a passenger. In paper [3] passengers count is done with the help of IR sensors and distance is calculated using motor and u slot sensor. After calculating distance, the amount is deducted from passenger's account. It is also accompanied with the system that if any accident is occurred then nearest hospital get automatically notified to it using GSM and GPS. In paper [4] RFID cards and reader is used to read card number which is send to database using WIFI and a fair amount is deducted from person's account. Other sources are books, online tutorials which are being used to gain knowledge throughout the project

III. IMPLEMENTATION

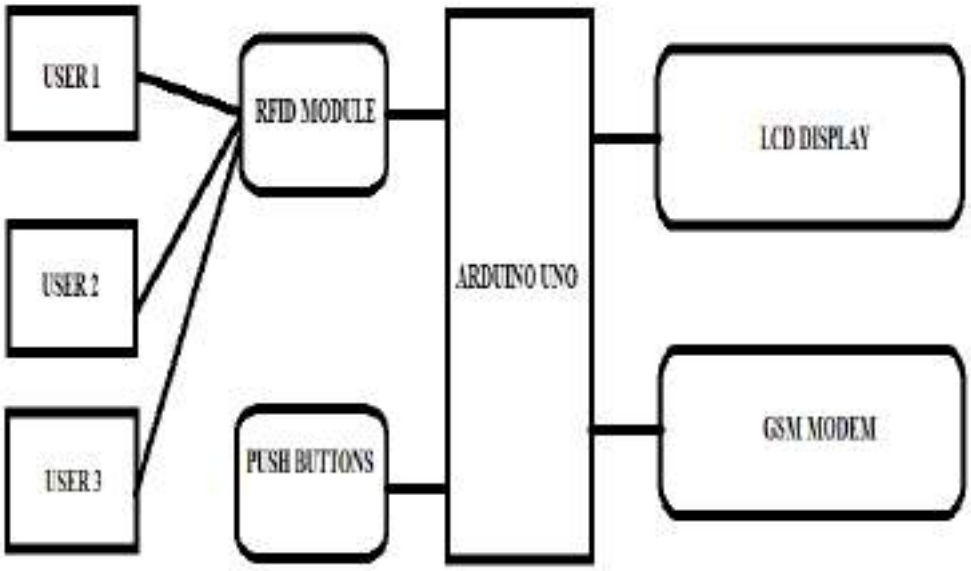

Fig 1: Block Diagram

The user scans his/her RFID tag with the help of the RFID module to check the authorization of the user. Once the user's tag is authorized the user is permitted to select the destination using the keypad. These are connected to the Arduino UNO and the processed data is sent to the LCD display and GSM modem. The LCD display displays the deducted amount, the selected station and the balance in the user's account. This data is sent to the registered mobile number through the GSM modem. All the passenger's data is sent to the driver's account.

IV. RESULTS

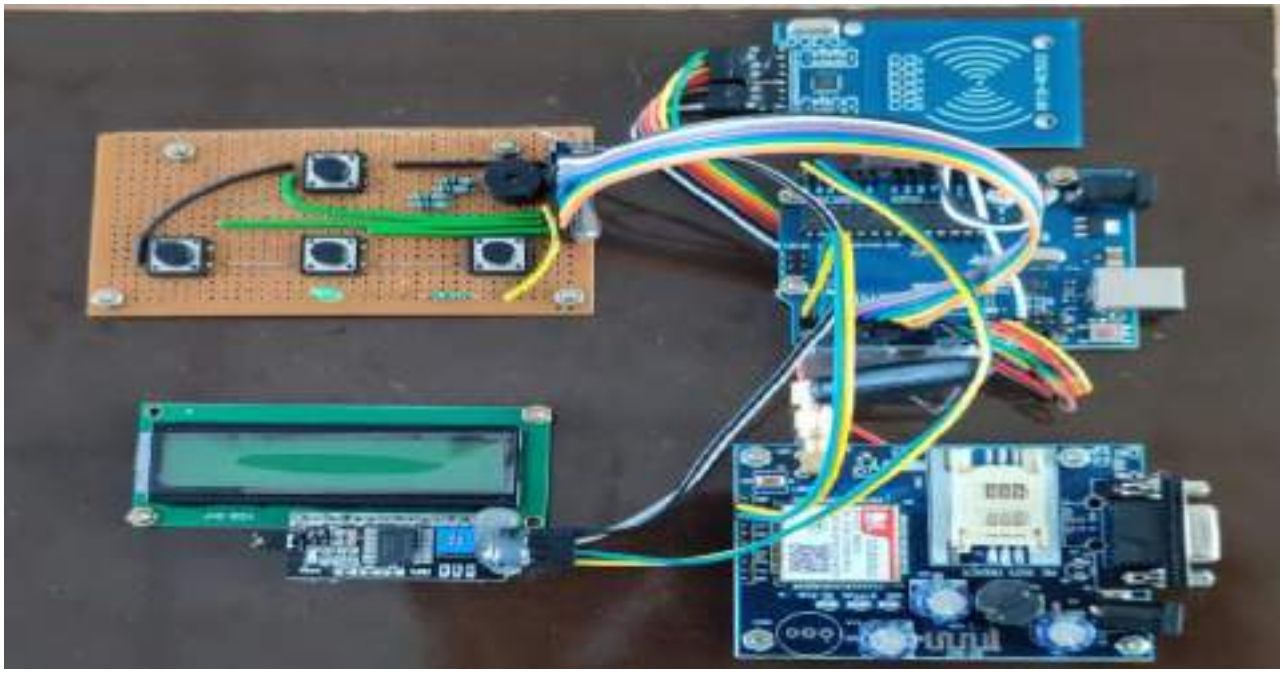

Fig 2: Circuit diagram

The design of hardware components are done and processed by using RFID and Arduino UNO.
The software implementation is by Arduino IDE tool.

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Design and Implementation of Decoder and MUX using Mixed Logic

K. Rajasekhar[1*] | K. Harika Devi[2] | A. Ruthik Kumar[2] | E. Ramya[2] | M. Kiran[2]

[1] Assistant. Professor, Department of ECE, N S RAJU Institute of Technology, Visakhapatnam, A.P, India.
[2] U.G. Scholar, Department of ECE, N S RAJU Institute of Technology, Visakhapatnam, A.P, India.
*Corresponding Author : rajkonari@gmail.com

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ABSTRACT

Mixed logic designs take prioritized place in logic design approaches which will give a simplified mechanism for the analysis of digital circuits. Also, a mixed logic implementation gives clear idea with regards to the activity of a circuit. Here in this, introduced mixed logic designs like pass transistor dual value logic (DVL), transmission gate logic (TGL), static CMOS. By using CMOS technology, it requires 20 transistors to design 2:4-line decoder but by using mixed logic we can design the same 2:4-line decoder with the use of 14transistors (14T) only. Introducing mixed logic approach a 4:1 MUX was designed by using 2:4-line decoder of mixed logic design. This new approach gives the better operating speed, low power consumption compared to conventional logic design by reducing the transistors activity and simulations are carried out using tanner EDA tools.

KEYWORDS: Mixed logic, Low power MUX, Line decoder, Transmission gate logic (TGL), Dual value logic (DVL) & Static CMOS

1. INTRODUCTION

In most of the integrated circuits, we generally prefer Static CMOS because of complementary nMOS and pMOS networks which results in good performance as well as resistance to noise and device variation. But by using CMOS technology, it requires 20 transistors to design 2:4-line decoder but by using mixed logic we can design the same 2:4-line decoder with the use of 14transistors (14T) only. Pass transistor logic (PTL) was developed as an alternative to CMOS logic. The main difference between the CMOS logic and PTL design is how the inputs are applied. In the PTL inputs are applied on the gates as well as source/drain terminals. PTL can be designed using either of nMOS and pMOS. The DVL has advantages over the PTL such as full swing operation while also maintaining reduced transistor count. A pair of nMOS and pMOS connected in parallel are called TGL.

2–4 Line Decoder: 2-bit input line decoder has 4-bit output. In conventional static CMOS line decoder uses 2 NOT gates and 4 AND gates. Instead of using AND gates we can use NAND gates as they are universal gates. So, for this design it uses 20 transistors for 2–4-line decoder.

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Iot Based Smart Notice Board

Y. Sravana kumar[1], D. Hima Varshini[2], D. Tilothama[3], D.Jagadeesh[4], I. Jithendra[5]

[1]*Asst. Professor,Departmentof ECE, NS RAJU INSTITUTEOF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA*

[2,3,4,5]*U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPTNAM, A.P.,INDIA*

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ABSTRACT: This project gives the best solution to replace the present paper-based notice board system with advanced electronic notice board. Wireless electronic notice boards have been designed, which completely eliminates paperwork and reduces the manual work and time. Building a IoT based projects gives the fast transformation of data and the user can access the data from anywhere in the world. In this project, we have developed a IoT based smart notice board. The main objective of this project is developing an automatic, self-enabled and highly reliable electronic notice board. A display connected with the cloud will continuously waiting for the message from the user, if the user uploads the data through the server, it will automatically upload to the LED. By using Wi-Fi moduleESP8266, the user can upload the message to the LED by accessing through the website connected to server. The user can write the data from anywhere in theworld to the LED. This will reduce the time to update the data as well as it will efficiently transfers the data to the end user.

Keywords: Arduino Uno, LED, Wi-Fi module, AT89S52 Microcontroller, SMPS for LED board

I.INTRODUCTION

The main purpose is to design this electronic notice board system is to interface it with user's mobile phones for displaying the latest information. In other words, the user sends the information from remote areas and this information is received through Wi-Fi module on the Arduino board at receiving end. This system is designed withAT89S52Microcontroller, which is interfaced with Arduino Uno and level shifter through serial cable. LED matrix is also used this system for displaying the information or data. The Wi-Fi module is wireless component that will maintain connection with server. We are using server and it has URL link that can be used by the authorized person and that person can write or re-write the information which want to display. This system is designed with AT89S52 microcontroller, which is interfaced with Wi-Fi module and level shifter through serial cable. LED Matrix is also used in this system for displaying the information or data.

The heart of this system is micro controller, this will receive data from Wi-fi modem using UART (universal transmitter and receiver), update this message on LED board through same UART only. This system also alerts the buzzer when new message is received. In this we are using Atmel AT89S52 controller, it is 8bit controller which has inbuilt 8k 8 bytes flash memory,256 bytes RAM and 32 I/O pins and UART. The advantages of this controller are low cost, availability of tools and resources are more.

Wi-Fi technology is a long-range wireless communications technology. It has beendeveloped rapidly in recent years. In this we are using Wi-Fi module and its operating voltageis 12v and 1 amp, data format is UART with 9600 baud rate. The advantages of Wi-Fi aremore secured and can sendmessagesfrom anywhere.Electronic noticeboards are userfriendly and echo friendly, they are replacing present paper usage notice boards. We can useeitherLCD orLED boards.LEDboardsare moreattractive.

II.LITERATURE SURVEY

Yash Tekkamaki [1] described "Large Screen Wireless Notice Display System" with an aim to increase the usability of electronic notice board, deals with wireless reception and display of message using Raspberry Pi. Practically, all output resolution is supported. This paper presents a way to incorporate messages in HTML script. It offers

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Implementation of High-Speed Low Power32-Bit Dadda Multiplier using CLA

P. Sahitya Kiran
Asst.Professor,
Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India.

K. Hari Krishna
U.G. Scholar,
Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India

K. Srikanth
U.G. Scholar,
Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India.

B. Neeraj
U.G. Scholar,
Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India.

Y Akhil
U.G. Scholar,
Department of ECE,
N S RAJU Institute of Technology, Visakhapatnam,
A.P, India.

***Abstract*: Multipliers and Adders are the basic hardware units in arithmetic operations. This project is implemented a 32-Bit Dadda multiplier using Carry Lookahead Adder (CLA) to reduce the delay, power consumption and increase speed while adding partial products in multipliers to get final sum quickly / Fastly. This project can be implemented/evaluated using Verilog HDL on Xilinx Vivado tool.**

***Keywords*: Dadda Multiplier, Carry LookAhead Adder, Verilog HDL.**

I. INTRODUCTION

Multiplication is the second most used arithmetic operation after addition, which has resulted in a large research interest in developing ways to improve the performance of multipliers. Multipliers have complex designs as a result of the large number of partial products that are formed during a multiplication; however, the general process can be broken down into three steps. The first step is to generate the partial product matrix. Each partial product is generated with an AND gate. As a result, N^2 AND gates are required in an N-by-N multiplier. The second step (referred to as the "reduction" step) is to reduce the N rows of partial products to 2 rows that have an equivalent value. This step has the most delay in a multiplier and is where most of the research effort, this report included, focuses on improving. The third step is to use a carry LookAhead adder (CLA) to add the 2 rows and obtain their sum which is the product of the two input operands.

There is a widely used approach, Dadda which are currently used in high-speed multipliers to perform the reduction step. This multiplier is constructed with half adders and full adders. By using these arithmetic components in parallel, a result can be obtained quickly. Moreover, by using carry lookahead adder the delay of the second step (the reduction) can be improved by up to 30%. The drawback is that the complexity of the design increases by up to 25%. The approach offers different benefits with regards to complexity and performance. This report analyzes the differences between the two adders RCA, CSLA with CLA.

II. LITERATURE SURVEY

Madhav Venkata, Srinivas Nandan, Sudhakar Alluri (2020) proposed an "HIGH PERFORMANCE 32-BIT
DADDA MULTIPLIER USING EDA". They design a 32-bit Dadda multiplier using SQRT CLSA with CBL which consumes less power but it comes with low speed & delay is high. In Dadda multiplier delay can be occurred, due to number of partial products during multiplication. The proposed project will be implemented with Dadda multiplier using CLA and simulated in Verilog language through Xilinx ISE tool. The proposed project aims in reducing the numbers of reducing partial products to get better power efficiency less delay and high speed [1].

s. manju, v. sornagopal, "An efficient of SQRT architecture of Carry Select Adder design by common Boolean logic" Carry Select adder (CSLA) is known to be the fastest adder among the Conventional adder structures. This work uses an efficient Carry select adder by sharing the Common Boolean logic (CLB) term. In this the logic simplification, we only need one OR gate and one inverter gate for carry and summation operation. Through the multiplexer, we can select the

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SLOTTED PATCH ORTHOGONAL MIMO ANTENNA FOR UWB APPLICATIONS

[1]Shaik Sultan, [2]Bayani Kavya, [3]Chandaka Pavan, [4]Deva Divya, [5]Saragadam Sirisha

[1]Asstistant Professor, [2]Student, [3]Student, [4]Student, [5]Student

[1]Electronics and Communication Department,

[1]N S Raju Institute of Technology, Sontyam, Visakhapatnam, India

Abstract : A new ultra-wideband (UWB) antenna is presented in this paper. A slotted patch orthogonal MIMO antenna consists of radiating patch on one side of dielectric substrate and has the ground plane on other side. A compact design and construction of microstrip Ultra-Wide Band (UWB) antenna is proposed. The 65 x 35 x 1.6 mm3 antenna is mounted ondielectricsubstrateFR-4 with thickness h=1.6mm, relative permittivity εr=4.4 and loss tangent of 0.025. The proposed antenna has the capability of operating in the frequency range of (3GHz to 13.5GHz) which is covering radio location, mobile and satellite applications. This antenna is designed using microstrip line feed model and simulated using HFSS software. In order to reconfigure the proposed UWB antenna to reject two bands, the final antenna design is based on inspired split ring resonator (SRR) and rectangular slots, positioned in the middle of the radiating patch. Most of the wireless communication systems need antennas which resonates at more than one frequency while sustaining a small size. Compared with conventional antennas, microstrip patch antennas have more advantages and better prospects. They are lighter in weight, low volume, low cost, low profile, smaller in dimension and ease of fabrication and conformity. The antennas are analyzed using the different antenna parameters like radiation pattern, Gain, Return loss, VSWR.

***Index Terms* - Ultra-wide band, patch antenna, slots, Split ring resonator, HFSS.**

I. INTRODUCTION

Ultra-wideband (UWB) is a radio-based communication technology for short-range use and fast and stable transmission of data. It has acquired a lot of popularity in wireless manufacturing since Federal Communication commission (FCC) permitted it's frequency band of 3.1 to 10.6 GHz. The main advantage which is attractive in this UWB technology is its high - capacity short range wireless communication using low cost , low energy transceivers .Due to short band of frequency range there will be an interferences with some other narrow band services which are already fulfilled by UWB bands .So By using the several methods and structures on the radiating patch of the antenna , these bands are filtered and rejected. One of the structure to overcome this problem is implementing the Split Ring Resonator with concentric circles (slot), moon shaped slot and a rectangular slot which helps to avoid the collision in the existing communication systems by improving the frequency band of the system. The slot radius of the inner split ring -used in our structure in figure 2- is varied to study the effect of changes of the rejected band. The first parameter r2 of The SRR slot is assumed to be constant(5mm) and then r1 is changed from 0.5mm to 2.5mm. As it shown in Fig.1, when the distance between two centres are too far in a way that the disk completely is eliminated from the geometry of the antenna has a wideband frequency notch that change. To investigate the effect of the second slot on the behaviour of the antenna by HFSS software, the length of the rectangular slot Lr is assumed to be constant(0.5mm) and the width Wr is changed from 12 to14 mm.

In this design to investigate the performance of slotted patch antenna analyzed in terms of bandwidth, gain, radiation pattern and antenna structure was built on FR-4 substrate. The relative permittivity of 4.4 and thickness of 1.6mm.

II. ANTENNA DESIGN

Fig. 1 shows the geometrical configuration of the proposed antenna. The proposed design is made of FR-4 dielectric substrate with thickness h=1.6mm, relative permittivity εr=4.4 and loss tangent of 0.025. The overall size of the antenna is 65mm x 35mm x 1.6 mm3. The antenna consists of a rectangular patch with steps and two slots (single ring resonator and rectangular). Inspiring from different antenna designs, we chose those offering small size, low cost, low complexity, light weight, and high-speed data rate, as this also makes them attractive for use in UWB applications.

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Implementation of Vehicle Starting Using Fingerprint Sensor & Accident Detection with Accelerometer, GSM & GPS

M.VEERAIAH[1], B.NANDINI[2], P.KOTESWARA RAO[3] , M.JASWANTH[4], M.JYOTSNA[5]
[1]*Asst. Professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA*
[2,3,4,5] *U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA*

Abstract -*This project is implemented for protecting the vehicle from the theft. Now-a-day's vehicle theft is increasing rapidly, So people have started to use the theft control system which is installed in their vehicles. The commercially available anti-theft vehicular systems are very expensive & this project is developed as low cost vehicle theft protection system using a ARDUINO UNO. By using fingerprint sensor we will start our vehicle only by the authorized users, which provides more security to the vehicles[2]. In this project we also used keypad system, which it gives access to new persons to start the vehicle in the absence of the original person. In this project RF transmitter and RF receiver are used to get notification if any theft action occurs this will be happen when vehicle got theft the RF receiver which is held by vehicle owner gives an indication of vehicle theft by switching of the LED so that vehicle owner can recognized that theft action get occurred. For driving the vehicle DC motor is used. In this project GPS is used for location of the vehicle and GSM is also used, which it will send an emergency alert message to police, family and ambulance along with exact location[4]. LCD is used for monitoring respectively.*

keywords: *Arduino Microcontroller, Accelerometer sensor, Fingerprint Module, GPS Module, GSM Module, LCD, RF transmitter & RF receiver.*

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I. INTRODUCTION

The Vehicle theft is increasing widely, simultaneously the theft ratio is also increased. Because of increasing number of theft cases of the vehicle there is a need to enhance the security level of the vehicles. Traditional and commonly used key locks available in the vehicles are easily unlocked by the professional thieves. With the help of master key, it becomes very easy to unlock the lock of the vehicles by the thieves. This project explores how to avoid this kind of stealing & provide more security to the vehicles. The implemented system contain single board embedded system which is equipped with Global system for mobile communication (GSM) and global Positioning System (GPS) along with a microcontroller installed in the vehicle. The use of GSM & GPS technologies allows the system to track the vehicle & provide the most up-to-date information about ongoing trips. Moreover, fingerprint sensor is done in the implemented system to ensure the driving of correct person. The implemented system is very simple with greater security for vehicle anti-theft protection & low cost technique compared to other. If the vehicle is met with an accident, an immediate alarm is sent to the family, ambulance & police with the current location of the vehicle.

II. LITERATURE SURVEY

In this research of this system it helps the people from the vehicle thief and accident detection of the vehicle. This research proposal is based on the very simple concept that where we can capture the finger by using the finger print module by authorized persons and vehicle gets started[1]. This project is placed in two wheeler vehicle security system so that it provides security to this vehicle[2]. The microcontroller which is inbuilt in the Arduino, the Arduino will perform all the operations in this system, if the Arduino is failed the project is also failed. By using this microcontroller in the Anti-Theft security system using GSM networks it sends message to the authorized person[3].By using the GPS module we can find the exact location of the vehicle of the vehicle theft and if any accident occurs we can also find the location easily by using GPS, multi-tracking system can also be done by the GSM & GPS[4].The road accidents is also increased rapidly, if any

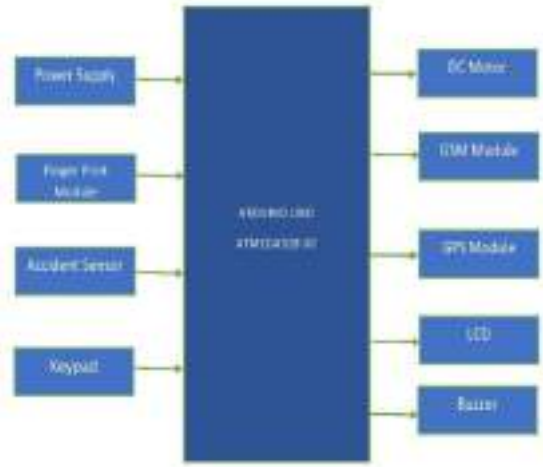
accident occurs there is a long reaction time which increments the number of deaths, therefore an automatic accident detection must exit to overcome this situation[5].The main goal is to identify where the accident occurred, sends the information to the rescue teams in considerably less time, so that they can take the necessary actions, to save the life of the victim[6].The approach is that to detect an accident ,GSM is used to send an alert message and location of accident traced by the GPS module[7]. These system measure change of tilt angle by means of an accelerometer sensor, speed by means of GPS and sends an alert on detection of the accident[8].In this system we can also place the eyeblink sensor and automatic braking system to slow down the bike. The IR sensor are used to monitor the eye blink and detect the state of drowsiness, which placed the RF module it sends an alert message to the nearby vehicles in the range[9].

III. PROPOSED SYSTEM

In this project we have interfaced the finger print module so that placing finger in this module vehicle can be started by the authorised persons only, which it is provides more security[1]. We have provided a keypad in project that unknown persons can also access the vehicle by entering the password, so then the vehicle can also started with the use of keypad[3]. We also placed accelerometer for accident detection, if an accident occurs then it sends immediate message to the ambulance, family and police by using GSM module[8]. By using GPS it sends the exact location of the vehicle so that we can easily identify[12]. The DC motor is used for driving the vehicle and by placing RF transmitter and RF receiver we can also detect our vehicle. The vehicle can be tracked in multiple paths. This system not only used in two wheeler vehicles, we can also use in automobiles, financial, banking and military etc…

IV. MPLEMENTATION SYSTEM

BLOCK DIAGRAM



This is the proposed system of our project, firstly the sim is inserted in the GSM module it will be activated. By placing the finger in the finger print module, it will take the input of only authorized persons only and displays the output on the LCD and vehicle gets started. By using keypad we can also start the vehicle by entering the correct password[11]. The DC motor is used for the driving of the vehicle. If an accident occurs

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AI BASED ROBOTIC ARM

P.V.J RAJ KUMAR[1],R.SOWJANYA[2],K.ANANDKUMAR[3] ,P.SANJAY[4],K.SAI KIRAN[5]

[1]*Asst Professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA*

[2,3,4,5] *U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPTNAM, A.P, INDIA*

ABSTRACT: *In this project for the control of an intelligent hand which can mimic the natural movement of the human hand. Implementing such intellectual hand finds its application in humanoid as well as personal robots. In this project vision-based interaction techniques are used to track the motion of the fingers and to extract the motion of the hand gesture accurately and promptly. Accuracy and effectiveness plays the key role for real time motion based applications. The robotic arm is one of the most widely used automation devices in the field of robotics science and technology. At present, the traditional manipulator control methods are mostly completed by preprogramming processing or command input from external devices. Such control methods are usually complicated and cumbersome are required operators to familiarize themselves with specific programming methods or according to different types of manipulators control instruction. The AI arm is controlled by the hand gestures of human hand by using the python open cv and Arduino board, there is no physical connection between the human hand and AI hand, while the human will gestures their hand in front of camera the open cv tracks the motions and sends to the AI arm without any delay due to the less delay in processing we can use the python open cv rather than the Matlab or else the open cv extract the motion from human hand and import into the AI hand.*

Keywords: *Arduino uno, servo motors, buck converter, robotic hand, batteries.*

Date of Submission: 07-06-2022 Date of acceptance: 22-06-2022

I. INTRODUCTION

Having The robotic arm is one of the most widely used automation devices in the field of robotics science and technology. At present, the traditional manipulator control methods are mostly completed by preprogramming processing or command input from external devices. Such control methods are usually complicated and cumbersome are required operators to familiarize themselves with specific programming methods or according to different types of manipulators control instruction**.** With the advent of accelerometers, a brand-new contactless somatosensory technology has been rapidly developed, showing a broad application prospect in the field of intelligent robots. The design of the robotic arm system better recognizes and senses changes in the human body, so as to achieve contactless control.

II. LITERATURE SURVEY

[1] M. Georgi, C. Amma and T. Schultz, "Recognizing hand and finger gestures with IMU based motion and EMG based muscle activity sensing", Proceedings of the International Conference on Bio inspired Systems and Signal Processing, pp. 99-108, 2015.Session- and person-independent recognition of hand and finger gestures is of utmost importance for the practicality of gesture based interfaces. In this paper we evaluate the performance of a wearable gesture recognition system that captures arm, hand, and finger motions by measuring movements of, and muscle activity at the forearm

[2] P. Jung, G. Lim, S. Kim and K. Kong, "A wearable gesture recognition device for detecting muscular activities based on air-pressure sensors", IEEE Transactions on Industrial Informatics, vol. 11, no. 2, pp. 485-494, 2015.Recognition of human gestures plays an important role in a number of human-interactive applications, such as mobile phones, health monitoring systems, and human-assistive robots. Electromyography (EMG) is one of the most common and intuitive methods used for detecting gestures based on muscle activities. The EMG, however, is in general, too sensitive to environmental disturbances, such as electrical noise, electromagnetic signals, humidity, and so on.

[3] R. Sekhar, R. Musalay, Y. Krishnamurthy and B. Shreenivas, "Inertial sensor based wireless control of a robotic arm", IEEE International Conference on Emerging Signal Processing Applications, pp. 87-90,

2012.the development of a wireless motion sensing control unit, whose operation is based on inertial sensors, and extends its application to the control of an anthropomorphic robotic arm. Accelerometers and a gyroscope are used to measure the orientation of the users lower arm and this data is transmitted wirelessly to a receiver where processing is carried out. The robotic arm is programmed to mimic the movements of the users arm.

III. IMPLEMENTATION

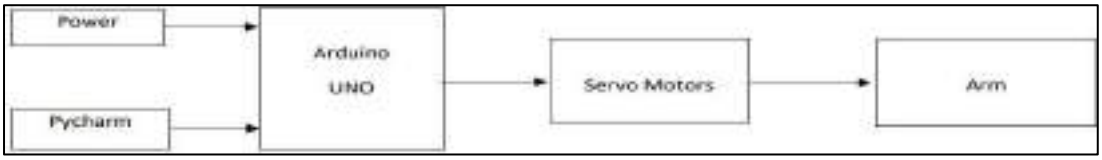

Figure 1: Block Diagram

The above block diagram shows the connections between the arduino and servo motors,the 9v dc power supply is applied from the buck converter to the servo motors through the batteries, the servo motors is attached to the printed robotic arm.The arduino is connected with 5 servo pins they are 9,10,11,13,12 and a buck converter is going to give enough power to arduino.the python programming in pycharn IDE is sends to the arduino UNO,then the particular movement is applied to the servo motors,then the servo motors is move the entire robotic hand.

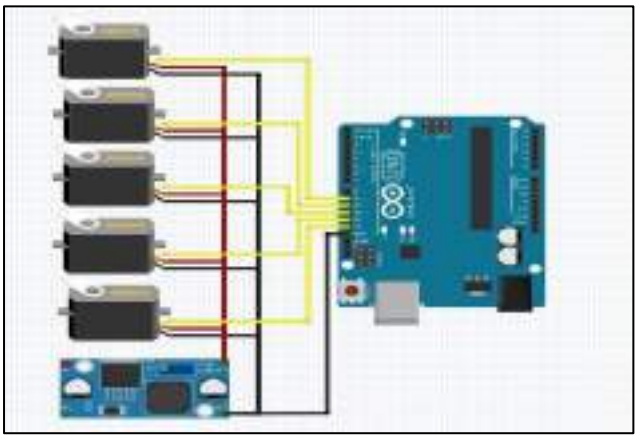

Figure 2:circuit Diagram

A 9V DC power supply is given to Arduino UNO,using batteries through buck converter. There are 5 servo motors are used in this project each motor is connected to the buck converter as well as to the arduino pins the entire motors is worked by using the arduino programming and python programming,the buck converter is converts the high power into required low power to the circuits.

IV. RESULTS

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IOT Based Smart Stand for LPG Cylinder Monitoring and Safety Enhancement

C.H. SHIVAJI[1], P. YASWANTH KUMAR [2], CH. GEETHA SRI[3], S. PAVANI[4], CH. SAI KISHORE[5]

Assistant professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P. INDIA
U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P. INDIA

ABSTRACT -- *It is an IoT-based Smart Stand for LPG Cylinder Monitoring and Safety Enhancement. LPG cylinders are currently used in every Indian home to cook. In order to make human life easier and safe an automated system is necessary. This system has a variety of monitoring tools that are both safe and automatic. It uses load cells to measure the quantity of gasoline left in the cylinder and it will be informed to the user through an LCD and a mobile/blynk interface. It also warns the user if the gasoline has depleted beyond the predefined limit. It detects gasoline leaks and performs a variety of accident-prevention tasks such as warning the user about gas leaks through a mobile interface called Blynk app and turns ON the exhaust fan and buzzer as well as turns off the gas regulator without the need for human intervention. Remote control of the regulator is also available, allowing you to extinguish the flame by turning off your regulator from anywhere using a mobile interface.*

KEYWORDS: *IoT, LPG cylinders, Load cell, Blynk, ESP 8266 NodeMCU, MQ-9 gas sensor*

Date of Submission: 08-06-2022 Date of acceptance: 24-06-2022

I. INTRODUCTION

Almost everything nowadays is safe and automated, excluding the LPG cylinder systems. In this paper, an automated safety system is presented that simplifies the human lifestyle in handling LPG cylinders while also reducing the risk of cylinder explosion incidents to some amount. Almost everyone estimates the quantity of gasoline in the cylinders by lifting it or igniting the fuel with a burner. Both are unreliable and imprecise methods of determining the amount of gasoline in cylinders. By utilizing a load sensor as a key component, this system communicates the quantity of gasoline existing in the cylinder to the outside world via an LCD.

The primary purpose of identifying the amount of gasoline is to book a cylinder when the gasoline in the cylinder runs out. This technique has the benefit of not requiring the user to constantly monitor the amount of fuel. Every user will be able to set their limit. When the gasoline reaches the limit, it sends a warning to the user, informing them that their fuel is about to run out and that they should book a new cylinder.

The majority of LPG mishaps are caused by gas leaks, which can cause explosions if not detected. This system employs an MQ9 sensor, which detects gas leakage and instructs the controller to activate the exhaust fan, allowing gasoline to escape from the premises and into the air, reducing the risk of an accident. It also notifies the mobile unit and sounds a buzzer to alert the user about the leakage.

When you are far away from the kitchen and remembered that you left food on the burner with the gas turned on, in this kind of scenario, you can't turn off the gas immediately. This system provides a mobile/blynk interface, using which you can stop the flame by switching off your regulator from any place you are at.

II. LITERATURE SURVEY

V. Tamizharasan, T. Ravichandran, M. Sowndariya, R. Sandeep, and K. Saravanavel paper [1] on *"Gas Level Detection and Automatic Booking Using IoT*" demonstrated monitoring the gas level in the cylinder and sending a notification to the user via a mobile network if the gas level falls below a specific threshold.

K. M. Sudar et al. paper [2] on *"Gas Level Detection and Automatic Booking Notification Using IoT"* demonstrated that notifying the user when there is a gas leak will not be enough to eliminate the risk of gas leak accidents, so they introduced a way to let the gas out from the premises by using an exhaust fan, with the result that if the user fails to identify the leak, the impact will be minimal.

M. H. B. M. Yaya, R. K. Patchmuthu, and A. T. Wan paper [3] on *"LPG Gas Usage and Leakage Detection Using IoT in Brunei"* Introduced an automatic regulator switching, which automatically turns off the

IV. BLYNK INTERFACE OF THE SYSTEM

Fig 2: Blynk interface of the system

The interface comprises two virtual switches, one switch is used to turn on/off the regulator and the other one is to turn on/off the exhaust fan. The switches are indicated whether they are on/off as in the form text on the switches. It is necessary to be updated when the regulator or exhaust fan is switched using physical switches.

Similar to the switches the interface provides two sliders that play a vital role in the limit setting. The notification percentage slider avails the user to set the required limit by sliding it. The principle behind obtaining the gasoline content is subtracting the weight of the cylinder from the gross weight to get the amount of gasoline available. A cylinder weight slider is a key to subtract the cylinder weight to obtain the gas content in the cylinder. The user needs to set the slider to a weight equal to the type of cylinder he/she using. This information can be found on the top of the cylinders.

There are two gauges that look like meters. One gauge is to indicate gasoline content available in the cylinder through which one can observe it either by digital number or by the amount of ring filled in the meter. The other gauge provides the gross weight of the cylinder

V. RESULTS

Fig 3: Front view of the proposed system

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Electronic Protection for Exam Paper Leakage Using Arduino Uno

Mr.S.JAYARAJU[1], N.SRAVANI[2] , V.RAMESH[3], B.KRISHNA[4], A.HARIKA[5]
Asst. Professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA
U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P.,INDIA

Abstract- *The project describes electronic protection for exam paper leakage which is a high-security system. The examination is the important aspect for the educational system to test the skills of student through online, orally on papers. Question paper comes to the college from university in electronic sealed box which is an embedded system designed with ARM processor. An RFID card will be given to the college authorities and password will send to college before 10minutes of exam. By swiping the RFID card with appropriate password, lock of electronic sealed box is open. If anyone tries to open the electronic sealed box before and after RFID swipe duration message will be send to university board through GSM which indicates exam paper is leaked. In existing system, there is a controller along with RFID module which requires RFID tags to access which is disadvantage, as the card can be used by any one and there is no tracking of person who is actually accessing it. In the proposed system we are overcoming disadvantage with biometric scanner. GPS module to access a system and to keep a track for the person accessing.*

Date of Submission: 06-06-2022 Date of acceptance: 21-06-2022

I. INTRODUCTION

Education is basically the motivating force of the society. An examination is the assessment planned to measure the skill, knowledge, physical fitness or aptitude and also classification in so many subjects. An exam may be on paper, on the computer, orally, in exam centers, which are conducted to test, calculate or examine the set of skills. Also the main purpose of the examination is to select the capable candidates for different positions. For the students main issues are question paper leakage, who suffer from the postponed or cancellation of the examination. Each and every year we hear news about postponed/cancelled exam due to paper leakages in the newspaper or on television. Sometimes the university itself doesn't know how there is leakage of any information content related to question papers. Hence, some student gets good rank in minimum time and with less effort and those students who really deserve the rank will not score even after hard work and maximum efforts. This aspect will create negative effect on students and demoralize the growth of society. So we have come up with a compact and portable solution and decided to design and implement an examination paper leakage protection system based on Arduino Uno. Along with the GPS, GSM modem, Finger print module, keypad, LCD, IR Sensor and electromagnetic lock are used in this system. First the question paper comes to the college from university in an electronic sealed box which is called Electronic Control Box. The Electronic Control Box is an embedded system that was designed using Arduino Uno, which has inbuilt RTC to monitor the Electronic Control Box. If anyone tries to open the box before exam time, the system communicates to the university authorities by sending an SMS (Short Message Service) and exam paper leakage location through GSM (Global System for Mobile communication) and GPS (Gobal positioning system) that "some malfunctioning has taken place with the Electronic Control Box".If the authorized person is absent by clicking the # button the unique OTP. The OTP will tell to the college authority of the college before 10 minutes of the exam. The chief authority will enter on the keypad the box will automatically opened.

II. PROPOSED SYSTEM

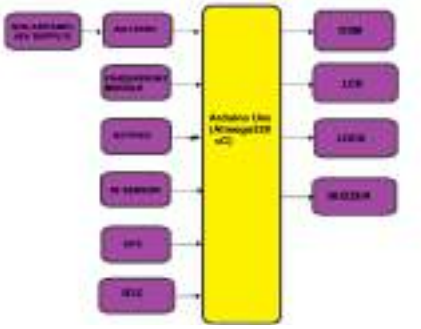

Fig.1. Block diagram

Shows the block diagram of "Electronic protection for exam paper leakage". The system consists of Arduino Uno, LCD Display, GPS, GSM, IR Sensor, Solar panel,RTC, Buzzer, Keypad, Lock, Finger print module. The Arduino Uno microcontroller, which acts as a brain of the system. This microcontroller controls the circuit function. Various components are interfaced with this microcontroller. The power supply from solar pannel. This power is provided by the rechargeable battery connected in the system. In this system we have interfaced IR sensor with the microcontroller to detect the person who is accessing the electronic box. A GPS is also interfaced with the microcontroller to determine the exact location of exam paper leakage.Then through by using GSM microcontroller will send the messages, if the authorite is absent by cliking # the OTP will send to the authority and also if the unauthorized person forcefully open the unauthorized accessing message will send to university. The RTC (Real Time Clock) is used to know the time of exam paper leakage, and also uses fingerprint module to access the fingerprints of the authorized person. The architecture of the proposed system also consists of a 16x2 LCD display, interfaced with the microcontroller for the display papasan buzzer is used to generate the beep sound if the unauthorized is forcefully open. Keypad is used to enter the OTPs from the authorized person.

III. RESULTS

Fih.2. Final output of the project

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IOT BASED AUTONOMOUS ROBOT FOR SAFETY ENHANCEMENT

[1] K. Y. K. G. R. Srinivasu, [2] K. Jyothi, [3] K. Ramana,
[4] Ch. Ramakrishna, [5] V. Praveen
[1, 2, 3] Assistant professor, [4, 5] U.G. Scholars,
[1, 2, 3, 4, 5] Department of ECE,
[1, 2, 3, 4, 5] N S Raju Institute Of Technology,
[1, 2, 3, 4, 5] Sontyam, Visakhapatnam, A.P. India.

ABSTRACT: Robot automation technology is evolving at a rapid pace to meet the world's growing demand for disaster management, rescue operations, and human risk reduction. These tasks necessitate use of multipurpose Robot with IOT. It is necessary to have a user-friendly robot that can be accurately controlled from anywhere by mobile app. The project presented here focuses on the design and development of a new product. Development of a multipurpose Robot which is used in different aspects like bomb-detection Robot and fire-fighting Robot, that can be operated from anywhere. To keep costs down, use locally accessible hardware. This is capable of carrying any complex object (up to 3kg) in a highly efficient manner which is helpful in defence for bringing medicines. The robot had gas, fire, and obstacle detection capabilities.

Keywords: [Robot, ESP32, Motor Driver, Submersible pump.]

1. INTRODUCTION

According to National Crime Records Bureau (NCRB), it is estimatedthat more than 1.2 lakh deaths have been caused because of fire accidents in India from 2019-2021. Even though there are a lot of precautions taken for Fire accidents, man-made disasters do occur now and then. In the event of a fire breakout, to rescue people and to put out the fire we are forced to use human resource which are not safe. With the advancement of technology especially in Robotics it is very much possible to replace humans with robots for Bomb Detection and fighting the fire. This would improve the efficiency of firefighters and would also prevent them from risking human lives. This is about a IOT Based Autonomous Robot for Safety Enhancement, which will automatically sense the fire and start the water pump.

Robot is defined as a mechanical design that is capable of performing human tasks or behaving in a human-like manner. Building a robot requires expertise and complex programming. It's about building systems and putting together motors, solenoids, and wires, among other important components. A multipurpose robot is one that has a small metal detector and fire extinguisher are added to it. By attaching a small fire extinguisher to the robot, the automation put out the fires it detects via Temperature Sensor module and also attaching small bomb to the Robot, it detects the harmful metal with help of metal detector by human controlling it from anywhere. A primary purpose of this undertaking is to provide an incentive for the robotics community to develop what will be a practical application for a real-world robot. Although it is merely a simulation of a real-world scenario, it requires the designers to use practical techniques to create useful designs.

Multipurpose Robots are autonomous robots or remote-controlled mobile robots designed for military, industrial, domestic applications, from search and rescue to attack. Some such systems are currently in use, and many are under development. Broadly defined military robots date back to World War II and the cold War in the form of the German Goliath tracked mines and the Soviet Tele tanks. The MQB-1 Predator drone was when "CIA officers began to see the first practical returns on their decade-old fantasy of using aerial robots to collect intelligence.

2. LITERATURE SURVEY

E Amareswar, G Shiva Sai Kumar Goud, KR Maheswari, E Akhil, S Aashraya, T Naveen

They proposed a robot that can be control using an application running on an android phone. Android phone sends control command via Bluetooth which is interfaced to the controller. The Controller interfaced to the Bluetooth module through UART protocol. According to commands received from the robot motion can be control. This robot is used for detecting bombs.

A Kuna raj, J Joy Mathavan, M Mathushan, G M Kamalesan

They proposed a robot which can be controlled from a limited distance by applications in android phone for landmine detection.

In this proposed system we are going to develop a multipurpose Robber. This robber had gas, fire, and obstacle detection capabilities. We also insert camera for live view and this robber is capable of picking up and carrying any complex object (up to 2kg) in a highly efficient manner which is helpful in defence for bringing medicines.

3. IMPLEMENTATION

Figure 1: Block Diagram

The main branch this project is ESP32. All the components are connected to ESP32 module. This project used for multipurpose and also implemented number of features in which live tracking this is the main advantage in the project and also this robot operating from anywhere through blink server and mobile phone. Metal detector use to detect the conductive metals up to a range of 50cm. Whenever it detects the metal then buzzer is activated and also robot. DHT11 temperature sensor sense the surroundings temperature, if the temperature increases due to fire by observed fire on the live tracking, then by the mechanism of submersible pump the fire is stopped. This can operate in dark areas with the help of LED strips which gives light to the path.

All the Motors used are connected to motor driver. With the help of gear motors robot can rotates 360 degrees. Gun used for self-defence for robot rotates 180 degrees with help of servomotor. By using another servo meter fire gun can be fired. Power supply for this robot is provided by lead acid battery. ESP32 WIFI module is directly connected to blynk server. By monitoring options in blynk application which is already installed in mobile.

4. RESULT

Figure 2: Front view of the designed model

CONCLUSION AND FUTURE SCOPE

Conclusion

This project describes about the real time metal detection and firefighting robot which moves in constant speed(5kmph). In metal detection it identifies the metal and sent notification along with buzzer and in fire-fighting it identify the fire then extinguish it with help of pumping mechanism. The detection and extinguish was done with the help ESP32 for which the gearmotor, temperature sensor and its driver etc, are interfaced. The robot is connected with the mobile phone through IOT module both hardware and software has been realized successful in this project. The "IOT Based Autonomous Robot For Safety Enhancement" can be used in everyday life.

Future Scope

By using lithium-ion Battery, the travelling speed and performance of the robot can be increase and also dispose the bomb by using picking up robotic arm. Instead of water fire can be control fire by using carbon dioxide, dry chemical and foam water.

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VOICE AND MEMS BASED PAGE TURNING ASSISTOR FOR DISABLED PEOPLE

[1] P. V. J Raj Kumar, [2] V. D. K. M. Lakshmi, [3] C. Suryanarayana,
[4] R. Pavan Kumar, [5] P. Sujith,
[1, 2, 3] Assistant professor, [4 5] U.G. Scholars,
[1, 2, 3, 4, 5] Department of ECE,
[1, 2, 3, 4, 5] N S Raju Institute Of Technology,
[1, 2, 3, 4, 5] Sontyam, Visakhapatnam, A.P. India.

ABSTRACT: Physically challenged persons must rely on each page turn to read a book and they must exert more effort than typical people. To make page reading easier for disabled people We provided a solution in the form of a voice-assisted page turner to the people. Arduino, which takes voice commands as an input, and turner as the controller, and the motor mechanism as the output unit, the page that is required to be turned is done When the user speaks his desired (direction) (Page must be turned) page name (next page or previous page) in front of the android phone which is connected to the Bluetooth module. The Bluetooth module is fed into the controller, which acts on it. The motor mechanism is set to turn the appropriate page. And if the person is speechless or having speech disorder, they can use their movement of one of their body parts to turn the page depends on the direction of the movement. MEMS Accelerometer is used to sense the movement of the body part and turn the page. As a result, the proposed article is a fantastic chance for anyone who could benefit from it.

KEYWORDS: [Arduino Nano, Bluetooth Module, MEMS Accelerometer.]

1. INTRODUCTION

Physically disabled or elderly persons have a hard time meeting fundamental needs like reading a book, and they rely on others to turn the pages for them. Some Turning-page gadgets, such as Page turners that can be operated manually and those that can be operated automatically- A manual page turner is made up of a stick that is held in one hand while the other is used to turn the pages.is maintained in the mouth or in the hand A rubber tip is on the stick. Enables the book's pages to slide more easily. This gadget is useful, User-unfriendly because it necessitates the use of one's lips and hands This is quite uncomfortable since it can cause damage to the mouth's corners. There's a lot of salivation as well. A page-turner that works automatically controllable motors.

So, this proposed system voice, movement-based page turning assistor for physically disabled people along with speech disorder aims at low cost and portability in use which should be operated at effort less for all kinds of disabled people.

2. OBJECTIVE

The main aim of this Voice & MEMS based page turning assistor isto make the page turning easier for the people who are differently abled. Physically disabled people must depend on other people for turning the pages while reading a book. So, to give a solution to this problem, a voice-based page turning is introduced. Here the pages turn to next page or previous page by simply giving the voice commands to the android phone which is connected to Bluetooth module. This command reaches to the Arduino nano and the motors which are connected will turn the page in required direction.

If the person is mute (having speech disorder) he/she may not be able to use their voice commands to turn the pages. So, for mute people, a movement-based page turning mechanism is provided. Here a MEMS accelerometer sensor is used to sense the movements of the person. According to their movement of any one of the body part, the pages will turn in the required direction.

3. LITERATURE SURVEY

Here we have taken some of the existing systems for voice-based page turning mechanism. Durga K Prasad Gudavalli, M Sai veerraju, I Swetha monica: They proposed a solution which is in the form of voice assisted page turner, which uses voicerecognition module as its input, Arduino as controller and motor mechanism set as output unit to turn required pages. When user speaks his required (direction in which page has to be turned) page name in front of micro phone of voice recognition module, the controller takes it as input and operates motor mechanism set to turn corresponding page.

Another reference we have considered is by HN Balachandra, S Jnaneshkumar, K Sanjay Nayak: They proposed a system which provides automatic page turning mechanism through voice commands. After turning the page, the content of the page should be read, for that, the whole page is scanned and read out to the user. Hence it useful for aged, disabled and blind people.

4. IMPLEMENTATION

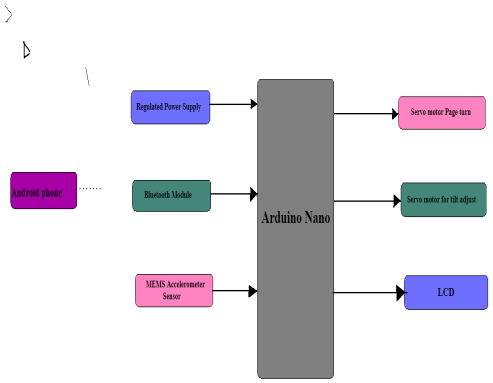

Figure 1: Block Diagram

This project model has use of Android phone in which the Bluetooth module is connected to the android phone to take voice commands to turn the page. If the person wants to turn the page to the "next page" he /she may give the voice commands through the android phone which is connected to the Bluetooth module. Similarly, if the person wants to turn the page to "previous page" he/she may give the voice commands.

The MEMS accelerometer is also connected to Arduino nano for the system to be operated in movement-based page turning mechanism. If the Arduino nano receives the commands, then the motor mechanism starts to turn the page in the required direction. The servo motor tilt is to lift the page that is to be turned in the required direction.

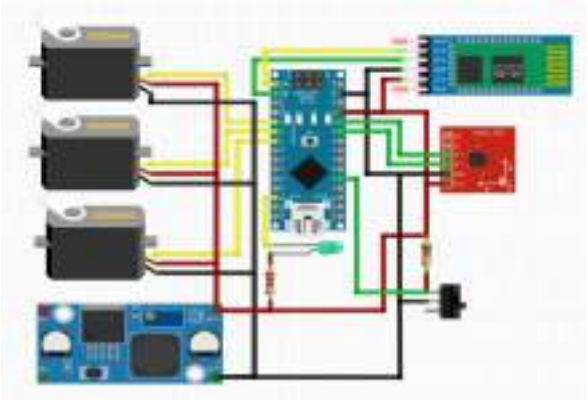

Figure.2:CircuitDiagram

5. RESULT

Figure 3: Top view of proposed prototype

CONCLUSION AND FUTURE SCOPE

Conclusion

The working model of page turning assistor for disable people is an excellent application that who could not move their hands and wish to read books. Since it uses voice commands as input, it avoids other support and strain in turning pages. This model was tested in various cases; such as price, size, efficiency, simplicity, and understandability of operation for illiterate people and it proved to be a best choice for differentially abled who could read a book by using voice commanded page reading. This model helps the people who are Mute, mute persons cannot use their voice to operate this model. So, to have a solution for Mute people, in this model the person who is mute can use their one of the body part movements to turn the page. To implement this function, a MEMS Accelerometer sensor is used to sense their body part movement and according to that movement the pages will turn.

Future Scope

In future the system be able to provide assistance to blind people by reading out the text in the book. The text in the book is scanned by the camera and read out by using speaker. And the page turning mechanism is same as the voice and Mems based page turning mechanism. As in the proposed system there is a solution for disabled people as well as for the people who are having speech disorder. So, in future there will be a solution for blind people also. The system provides feature of adjustable book position with the voice commands in future.

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Arduino Based Coal Mine Safety Monitoring and Alerting System for Workers

V.Aswani[1], G.Prudhvi Sai Kumar[2], A.Lavanya[3], J.Harish Kumar[4], P.Vashika[5]

Asst. Professor, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA

U.G. Scholars, Department of ECE, N S RAJU INSTITUTE OF TECHNOLOGY, SONTYAM, VISAKHAPATNAM, A.P, INDIA

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ABSTRACT: Coal is a major element for development, an important energy source for power generation, and it is an essential part of the manufacturing of alumina, iron, steel, cement, and other resource products necessary for modern living. The extraction of coal from the field is known as coal mining. Safety and security are critical components in the mining sector. Even they take certain precautions to avoid accidents in the underground mines. Still, accidents continue to occur in underground mines, resulting in a greater number of disasters. Temperature, gas, fire, and water are the key elements involved in many accidents. This project monitors these parameters using Arduino UNO and provides safety and alert for coal mine workers to minimize the accidents. To improve underground mine safety, a reliable communication system must be built between underground mine workers and a fixed ground system. The communication network must not be interrupted at any time or under any circumstances. A buzzer is used for alerting the mine workers. Using IoT and Buzzers, this system alerts the admin as well as the workers when any abnormalities are found inside the coal mine.

KEYWORDS: Arduino UNO, Coal mine, Monitoring, Alerting

I. INTRODUCTION

The process of Underground mining operation through human laborers is a highly unsafe scenario where the risks increase with the increase in distance from the ground. The mining operations with unsafe manners are due to different methodologies utilized by the miners for extricating diverse minerals. The longer the mine, the more prominent is the hazard. The safety measures execution is very poor, especially in the coal mine industries. Coal is an essential resource to every nation as it has many commercial applications. The most integral employments of coal are in the production of thermal power, cement, and steel production and as a fuel for numerous applications.

The coal mines have numerous risky stipulations that include high temperature and humidity, and discharge of destructive gases that make unsafe surroundings for specialists working there. Many employees are taking off their occupations in coal mines or are no longer at all inclined to pick such employments as mining. This creates a lot of challenges in the accessibility of employees for the coal mining industry. The security of laborers working in coal mine industries is increasing day by day through technologies. The progressive innovation that enables the mine monitoring methods to become more sophisticated, however, explosions in underground coal mines still happen. The accidents of calamities in coal mines are mainly due to the harsh environments and unsafe working conditions. This makes the need of employing mine checking systems at a high level for coal mines. It is quite hard to analyse all the environmental conditions constantly in a coal mine manually.

A wireless sensor network for coal mining safety systems. In this wireless sensor networks application system, there will be controllers. The controllers will detect the danger and give an alert through RF to the controller and it will raise the alarm in all tunnels and also raise a message on IoT, which will help to take action as soon as

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sensor values exceeds a particular threshold level, the buzzer is turned on to notify the concerned officer. The system has an IoT platform installed on it that displays the relevant data using the GUI which helps the users in monitoring and system control. The proposed system as shown in the Fig.

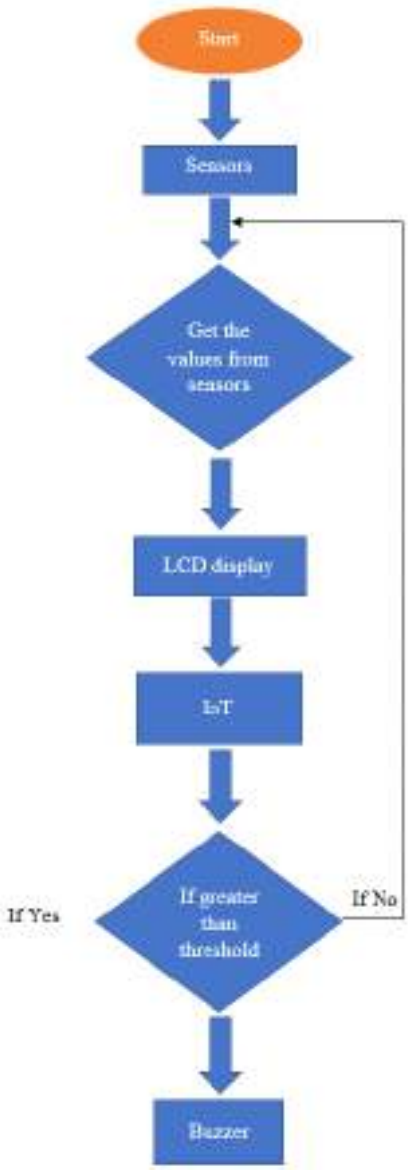

Figure 2: Flowchart Diagram

From the above graph, it is seen that whenever the parameters exceed the threshold limit i.e., then the designed system will show the alert message on the lcd display and a buzzer will sound. Also, the IoT website gives this information to distant people hence it helps to prevent hazards.

IV. RESULTS

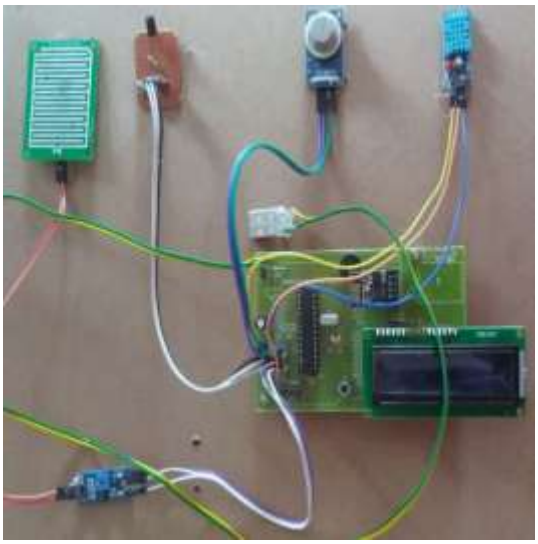

Figure 3: System Model

The design of hardware components are done and processed by Arduino UNO. The software implementation is by Arduino IDE tool. Here are the figures of the results.

Figure 4: System Readings

V. CONCLUSION & FUTURE SCOPE

5.1 Conclusion

This system consists of various sensors to monitor the safety while operating in coal mines. This system consists of devices that monitor the conditions such as temperature, humidity, water, fire and gas inside the coal mine and alerts the workers. It also has applications to view the readings remotely. This system is wireless hence it has the advantages that wireless systems have such as being economical and having low maintenance.

5.2 Future Scope

Future work of this research includes additional enhancement of the framework by employing different advanced sensors for analysing the underground mines. New developing connectivity improvements can be used for quick

Arduino Based Floor Cleaning Robot

BOKAM DIVAKAR1, DR. R. S. R. KRISHNAM NAIDU2, KAYALA AVINASH[3], POTNURU ANJI[4], SUMANTH MAHARANA[5], KODIGUDLA DINESH[6], P. B. N. V. SAI PAVAN[7], SALAPU SRAVANTHI[8], TALARI CHANDINI[9]

[1] *Assistant Professor of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology*

[2] *Associate Professor and Head of the Department of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology*

[3, 4, 5, 6, 7, 8, 9] *Students of Department of Electrical and Electronics Engineering of Nadimpalli Satyanarayana Raju Institute of Technology*

Abstract— Smart Dust collector as its name represents it works smartly or we can say that it is an automatic Dust collector. It detects the dust objects and collects the dust. So, there is some sensor work to detect the object around the dustbin. Sometimes due to dust cleaning activities take a long time then there are other activities that are overlooked. For this reason, we are trying to develop a smart floor cleaning robot that can navigate & clean dust.

Indexed Terms-- Arduino, Dust Collecting Robot, Ultra-Sonic Sensor, DC Shunt Motor, Motor Driver

I. INTRODUCTION

Cleaning is important work approximate in every place. Sometimes this is easy and sometimes Cleaning is Important work approximate difficult. Sometimes we assigned people for purpose of cleaning and pay money and sometimes cleaning is required in areas where presence of living being dangerous so we cannot assigned living being in every place. In advancement of science a robot come in light but it operate by a personnel. To avoid this limitation of personnel we require more technologies.

Automation is a great solution of this problem. So we make an autonomous floor cleaning robot that operated by internet of things and Arduino Nano programming. Ultrasonic sensor is the most important component for autonomous floor cleaning robot because ultrasonic sensor works as eyes of robot. Ultrasonic sensor useful for turning of robot by sense the obstacle or wall. Sensing distance range of robot set by Arduino Nano programming. In this range robot sense the obstacle and turn back.

Cleaning is the essential need of the current generation. Basically, in household floors the floor has to be cleaned regularly.

SECTION - I

PARTS OF FLOOR CLEANING ROBOT:
In Floor cleaning robot there are several parts. They are

1.Chassis, 2. Wheels, 3. DC shunt motor, 4. Batteries, 5. Ultra - sonic sensor, 6. Motor driver, 7. Node MCU, 8.Wiper motor and other components.

SYSTEMS USED IN FLOOR CLEANING ROBOT:

As like floor cleaning robot have various systematic or principle components as, below we described briefly about each component.

WORK HAS BEEN DIVIDED INTO FOLLOWING

1. Design
2. Fabrication
3. Motor

- Arduino Nano:

The Arduino Nano is a surface mount breadboard compatible version of the ever- popular Arduino micro controller. It's small with integrated on-board USB and is breadboard friendly. As the function It has almost all the analog and digital pins that the UNO or Demilune and the same function as Duemilanove or

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Design Space Projects during the Academic Year 2021-2022

1. **Arduino Based Floor Cleaning Robot**

Cricket Bowling Machine

Mr.K.M.M.Tarakesh[1], Ch.S.L.Swarup[2], K.Divya[3], P. Govinda[4], M.Hari[5], S.Jeevan Kumar[6], S.Venkatesh[7], T.Rajesh[8]

[1]*Assistant Professor of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology*

[2,3,4,5,6,7,8] *Students of Department of Electrical and Electronic Engineering of Nadimpalli Satyanarayana Raju Institute of Technology*

***Abstract*— Science is basically passive observation of the universe as it exists to generate knowledge and Engineering .is making use of that. Engineers always look upon the problem from technical point of view. An engineering project is balanced cocktail of the practical aspect of the humanity and economics. New ideas and inventions are the part of engineer's life. Ball pitching devices have been used in sport practice from many years. The aim of this project is to design a cheapest ball pitching system ever to throw the automatically at different suitable adjustable speeds for the cricket practice. Typically, balls are thrown from a device using motors, discs and swing can also beset by the operator. The report shows all the design criteria (including mechanical and electrical aspects to develop a professional cricket-pitching machine.**

1.INTRODUCTION

The concept of the cricket-pitching machine provides accurate and consistent batting practice for cricketers of all standards. It is best cricket practice facilities available to all cricketers at an affordable price, which have recognized a very tangible and enjoy able way to improve batting performance. Since the successful launch of the first BOLA in 1985which was purchased by Surrey Country Cricket Club and shortly afterward the England Test Side, Stuart Williams. And this have encouraged other for continuous improvement and development of this dynamic instrument (thus to us also).

The main mechanism of the machine consists of two heavy wheels, between the concept of the

Cricket-pitching machine provides accurate and consistent batting practice for cricketers of all standards.

2. BLOCK DIAGRAM

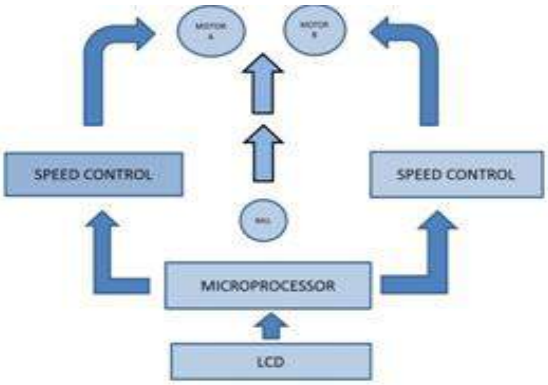

Fig 2: Block diagram of bowling machine

3. PARTS OF BOWLING MACHINE

In Bowling Machine there are several parts. They are

1 Motor
2 LCD Screen
3 Battery
4 Capacitor
5 Field Effect Transistor

3.1 PMDC MOTOR

In fig3.1, a PMDC motor, an armature rotates inside a magnetic field. The basic working Principle of a PMDC motor is based on the fact that Whenever a Current carrying conductor is placed inside a magnetic field, there will be mechanical force experienced by that conductor.

Fig 3.1 PMDC Motor

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Design Space Projects during the Academic Year 2021-2022

2. **Cricket Bowling Machine**

Automatic Solar Street Light Using Arduino

K.Naveen[1], P. Geetha Rani[2], B.Sai Prathush[3], N.Chakradhar[4], P. Sagar[5], S. Devi[6], S.Gowtham Sai[7]
[1]*M.Tech, Assistant Professor of Electrical and Electronics Engineering, Nadimpalli SatyanarayanaRaju Institute of Technology*
[2,3,4,5,6,7] *Students of Department of Electrical and Electronic Engineering of Nadimpalli SatyanarayanaRaju Institute of Technology(A)*

***Abstract*— This paper suggests energy efficient of automatic street light by using Arduino. The main objective is to design energy efficient automatic streetlight for energy conversation in present streetlights of rural area, urban area and completely for smart cities. The system LED, solar panel, charge controller, Battery, Arduino. The system is set to automatically turn OFF during the hours of daylight and only operate during the night.**

1.INTRODUCTION

The solar street lights absorb the solar energy during daytime. The solar energy gets converted into electrical energy by the photovoltaic cells, which is stored in the battery. During night-time the lamp starts automatically and the electricity already stored in the battery gets consumed. The system is to design and provide an automatic control facility. Street light controllers are smarter versions of the mechanical or electronic timers previously used for street light on-off operation.

By using this system Energy consumption is also reduced because now-a-days the manually operated street lights are not switched off properly even the sunlight comes and also not switched on after sunset.

1.1 BLOCK DIAGRAM:

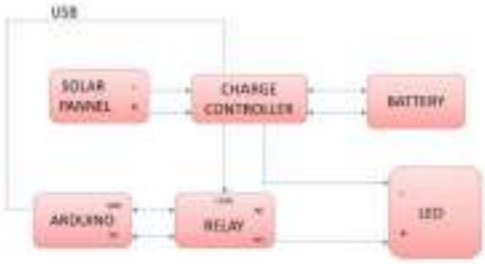

Fig.1.1 Block diagram

2. SOLAR PANEL

Solar panel is one of the most important parts of solar street lights, as solar panel will convert solar energy into electricity. There are 2 types of solar panel: monocrystalline and poly-crystalline. Conversion rate of monocrystalline solar panel is much higher than polycrystalline.

Fig2.1Solar panel

3.ARDUINO

Arduino is an open-source platform based on microcontroller board having the ATmega32 series controllers and Integrated Development Environment for writing and uploading codes to the microcontroller. It has input and output pins for interaction with the outside world such as with sensors, Switches, Motors and so on. To be precise it has 14 digital input/output pins, 6 analog inputs, a 16MHz quartz crystal, a USB connection, a power jack, an ISCP header and a reset button It contains everything needed to support the microcontroller. It can take supply through USB or we can power it with an AC-to-DC adaptor or a battery. It takes inputs from the LDR, process the data and gives the output

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Makers Space Projects during the Academic Year 2021-2022

1. Automatic Street Light Using Arduino

Automatic Bottle Filling Using Plc

K.S.Ramanjaneyulu[1], R.Naresh[2], G.kartheek[3], A.Srinivasu[4], K.karthik[5], M.Prasanth[6], R.Lavanya latha[7]
[1]*M. E, Ph. D, Assistant Professor of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology*
[2,3,4,5,6,7] *Students, Department of Electrical and Electronic Engineering of Nadimpalli Satyanarayana Raju Institute of Technology(A)*

Abstract: **The objective of our project is to design, develop and monitor "Automatic bottle filling system using PLC". This work provides a lot of benefits like low power consumption, low operational cost, less maintenance, accuracy and many more. This project is based on Industrial automation and is a vast application used in many industries like milk industries, chemical, food, mineral water and many industrial manufacturers. A prototype has been developed to illustrate the project**

Filling is the task that is carried out by a machine and this process is widely used in many industries. In this project, the filling of the bottle is controlled by using a controller known as PLC which is also the heart of the entire system. For the conveyor system, a dc motor has been selected for better performance and ease of operation. A sensor has been used to detect the position of the bottle. In our project we have used less number of systems hence the overall cost has been reduced to an extent. Ladder logic has been used for the programming of the PLC, which is the most widely used and accepted language for the programming of the PLC. The PLC used in this system is a MELSEC FX-1N which makes the system more flexible and easy to operate

I. INTRODUCTION

The project is based on industrial automation and PLC is the heart of automation. The hardware and the software are the two important areas in our project.

1) HARDWARE DESCRIPTION: In this project, MELSEC FX1N-24 is used for controlling the inputs and outputs. Input supply to the PLC is given through a SMPS. The rating of the SMPS is 24VDC 5 Amps. The PLC used here is a compact PLC which has a fixed number of inputs and outputs. In this kind of PLC model, the CPU contains 14 digital inputs and 10 digital outputs. One diffuse photoelectric sensor has been used for the positioning of the bottles. A geared DC motor has been used for running the conveyor system. The rating of the DC motor is 12V and 50 RPM speed with a high starting torque of 70 Kg-cm (at no load). Toggle switches are used to serve the purpose of some inputs to the PLC.

2) SOFTWARE DESCRIPTION: There are five important languages which are used for the programming of the PLC. The list of the methods are as follows: ● Functional block diagram (FBD) ● Structure text ● Instruction list ● Flow chart ● Ladder diagram Out of these five languages, ladder is the most widely used language and is simple as compared to other languages. Ladder diagram has been used for the programming of this PLC is the most widely used language and is simple as compared to other languages. Ladder diagram has been used for the programming of this PLC

II.LITERATURE SURVEY

1.An Automated Bottle Filling Project For Freshman Engineering Students –June 2005 In this paper the researchers Kala Meah, Timothy Garrison , York College of Pennsylvania at all.. The students work in small teams and have r toughly 12 weeks to design an automated electromechanical system that first transports three empty bottles, three tennis balls. The machine must fill each bottle of water, filled bottles to an area outside of the operational zone.

2. PLC Based Automatic Bottle Filling System With User Defined Volume Selection -8thAugust 2012.In This Research Paper the researchers T. Kalaiselvi, R.Praveena at have develop an automatic bottle, filling system with a mechanism using sensors. Automatic filling process for all the bottles simultaneously with a user defined selection for volume to be filled.

Different height Using Programmable Logical Controller –14th July 2013.In This Research Paper the researcher MALLARADHYA H M, K R PRAKASH have Design and Develop an automated liquid filling

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Design Space Projects during the Academic Year 2021-2022

3. Automatic Bottle filling Machine using PLC

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Design and Modeling of E-Bike

Mahesh Palavalasa[1*], R. S. R. Krishnam Naidu[2], Gayathri Garrepalli[3], Annapoorna Pinninti[4], Sai Ganesh Appalabathula[5], Sudheer Kumar Kalyana[6], Srinivas Molli[7], Uma Shankar Narem[8]

[1]*Assistant Professor, Department of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Visakhapatnam, India*
[2]*Associate Professor, Department of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Visakhapatnam, India*
[3,4,5,6,7,8]*Student, Department of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Visakhapatnam, India*

***Abstract*: This project details about the Electric Bike which runs on the battery thereby providing voltage to the motor. This project compromises with design and fabrication of Electric Bike which makes use of Electric energy as the primary source and solar energy, if possible, by attaching solar panels. It also highlights on the design aspects of the bike. There is a provision for a charging the battery by ejecting it from the main system. The electrical power generated which is used to run the bike can give better fuel economy compared to conventional vehicle, better performance and also causes less pollution. The project is to design a feasible yet highly adaptable E-bike. As the number of motor vehicles on the roads throughout the world increases at staggering rate each year, the dependence on oil-based fuel grows almost unchecked. The increased use of non-renewable fossil fuels brings with it environmental problems such as: the "greenhouse effect", health problems for city delivers and concern over the stability of fuel supply. To move away from this dependence on oil, a vast amount of money is being spent on the development of electrical vehicles (EVs) that may be produced. This project presents a study of electrical motorcycle design. The aim of this study is to investigate how to design a simple, cost-effective model of electrical motorcycle with intelligent control system. This can be implemented by removing the internal combustion engine, the exhaust system and other unnecessary components from the motorcycle and replaced by an electrical motor, an intelligent controller.**

***Keywords*: Electric bike, Power, Economical, Hub motor, Battery, Analysis, Chassis.**

1. Introduction

An electric bike is, first and foremost, a bicycle. It uses the same designs, geometries, and components as any other bicycle, but also includes an added electric motor. This is fuelled by a rechargeable battery, which gives riders an extra boost of power and ultimately provides a smoother, more convenient, and less strenuous cycling experience. The idea of creating an electric bike has intrigued cyclists since the late 1800s, when several American inventors experimented with the possibility of combining the potential power of electric motors with the simple mechanics of the bicycle. It wasn't until the technological advancements of the 20th and 21st centuries, however, that this idea finally became a viable reality. With lightweight motors, high efficiency rechargeable batteries, smoothly shifting drive trains, and huge advances in bicycle components, today's electric bikes provide a way for cyclists of all ages, fitness levels, and physical needs to enjoy the benefits of cycling, whether it's a leisure ride, a workout, or part of a daily commute. For many, electric bikes are an attractive alternative to both conventional bicycles and traditional automobiles, providing an environmentally friendly, fun, efficient, and convenient way to travel.

The e-bike is an electric vehicle, an advanced version of the pedal bicycle, powered by a rechargeable battery. These bikes are an excellent alternative for people who want to switch from a car for their daily commute. The population of India is 1.35b billion, and nearly 253 million vehicles are there on the road [1]. In India, cities are experiencing excessive traffic and noise pollution, leading to inexorable air pollution from the last few years.

As the gasoline-driven two-wheeler sales figures increased during the late 20th and early 21st century, the number of exhaust emissions caused by them also increased. These exhaust emissions from the petrol-powered internal combustion engines gave out various harmful gases and particulate matter in the environment. With an increased fuel consumption trend, the toxic constituents are continuously being released in the surroundings every day [3]. The emissions led air around us to start degrading in quality, getting polluted, drawing extensive attention to the degree of the air pollution caused both locally and globally.

One of the primary sources of pollution in urban areas is the two-wheeler traffic. These exhaust emissions contain various toxic components, which are associated with severe adverse health effects, including premature death, respiratory symptoms, impaired lung function, and cardiovascular diseases.

2. Methodology

An electric bike is a battery-operated vehicle that runs on the stored chemical energy inside the rechargeable battery packs. An electric bike is a pure E-bike if it exclusively uses its electrical power and not any other secondary power source. Electric motors and motor controllers propel these vehicles via various drive mechanisms, delivering the wheel's power.

A. Design Objective

The frame is inspired by the renowned two-wheeler

*Corresponding author: mahesh.eee@nsrit.edu.in

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Makers Space Projects during the Academic Year 2021-2022

2. E Bike

GO-Kart Using PVC Pipes

R.Srinu[1], Ch. Dileswarao[2], Ch. sirisha[3], K. Mounika[4], K.Trivikram[5], K.Eswarao[6], Md.Sameer[7]
[1]*Assistant Professor of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology*
[2,3,4,5,6,7] *Students of Department of Electrical and Electronic Engineering of Nadimpalli Satyanarayana Raju Institute of Technology*

***Abstract*— The first go-kart was simply a cart consisting of wheels and handles jointed together as children pushed from behind when learning to walk or a four-wheeler platform where children where children can sit on it while another push the kart around. Go-kart was invented in California by Art Ingles and Lou Borelli using 100cc mower engines and strong steel frames. Then, newly designed karts were beginning to gain popularity in Britain around the year 1959-1960"[1],[3].**

Day to Day it must be effect on our daily travelling with minimum cost, so in order to travel without fuel we design go-kart using PVC pipes under Rs.30,000/- so we hope that our project will have recognized in this competitive world. This report explains how go-kart was made, its objectives and uses etc"[4],[6].

INTRODUCTION

Go-kart has long existed in our world whether it is used for recreation. According to Graham Smith (2002), Art Ingles who was a veteran hot rod and race car builder at Kurtis Kraft in California, America invented the first ever go-kart in 1956. Initially, karting is a leisure motorsport enjoyed by airmen during the post-war period. The sport is quickly caught on with Go Kart Manufacturing Co. Inc. Being the first company to manufacture and distribute go-karts after two years. In 1959, McCullough also jump in the bandwagon of the industry, by becoming the first company to manufacture go-kart engines. Although go-kart originated from United States, it has also gain interests from countries all over the worlds especially Europe"[2],[5].

By design Go-kart we can travel free of fuel because now day the price of petrol is varying day to day'[3],[4]. Go-kart is simply made by PVC (Polyvinyl chloride)

PARTS OF GO-KART:

In Go-kart there are several parts. They are

1. Chassis, 2. Wheels ,3. Motor, 4. Dc motor,
5. Batteries ,6 Steering and other components.

SYSTEMS USED IN GO KART:

As like automobile Go-kart also have various systems like cooling system, lubrication system

WORK HAS BEEN DIVIDED INTO FOLLOWING

- Design
- Braking
- Steering
- Motor

DESIGN:

First of all chassis made by PVC pipes and ply wood sheet. Pipes are marking required size and cut by the axial blade, after cutting pipe in our required measurements we must connect the pipes with couplings and fittings .After that take plywood Sheet same length of the chassis make adjustments as we required bolted with PVC pipe chassis.

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Makers Space Projects during the Academic Year 2021-2022

4. GO-Kart Using PVC Pipes

Temperature and Face Mask Scan Entry System

Mrs. S.Yamini[1], D.Gowtham[2], K.Uma maheswari[3], B.Karthik[4], K.Prudhvi yadav[5], P.Siva rama krishna[6], U.Sai krishna[7]

[1]*M.Tech, Assistant Professor of Electrical and Electronics Engineering, Nadimpalli Satyanarayana Raju Institute of Technology*

[2,3,4,5,6,7] *Students of Department of Electrical and Electronic Engineering of Nadimpalli Satyanarayana Raju Institute of Technology*

***Abstract*— COVID 19 pandemic is causing a global health epidemic. The most powerful safety tool is wearing a face mask in public places and everywhere else. The COVID 19 outbreak forced governments around the world to implement lockdowns to detect virus transmission. According to survey reports, wearing a face mask at public places reduces the risk of transmission significantly. A machine learning model for monitoring body temperature and face mask detection. The proposed model can be used for any shopping mall, hotel, apartment entrance, etc. As an outcome a cost-effective and reliable method of using AI and sensors to build a healthy environment. Evaluation of the proposed framework is done by the Face Mask Detection algorithm using the open-CV software library. Besides, the body temperature of the individual is monitored using a non-contact temperature sensor.**

1.INTRODUCTION

Since the last days of the previous year, the occurrence of novel infectious flu-a like respiratory disease COVID-19 caused by SARS-Cov-2 virus (also known as corona virus) has affected almost every aspect of people's lives globally. However, the crucial problem is the lack of approved vaccine and medication due to these facts, many protection and safety measures were taken by governments in order to reduce the disease spread, such as obligatory indoor mask wearing, Social distancing, quarantine, self-isolation etc.., We focus on most common indoor measures - people with high body temperature should stay at home, wearing mask is obligatory and distance between persons should be at least 1.5-2 meters.

The purpose of the project is to detect the person perfectly wearing mask or not and temperature detection of the person if the both are correct then the door allows the person in. The first step to detect COVID is by scanning for fever. Also, we need to monitor every person for a mask. We have temperature checking systems for every entrance for scanning but manual temperature scanning has a lot of disadvantages. To solve this problem, we here propose a fully automated temperature scanner and entry provider system. It is a multipurpose system that has a wide range of applications. The system makes use of a contactless temperature scanner and a mask monitor. The scanner is connected directly with a human barrier to bar entry if high temperature or no mask is detected. Any person will not be provided entry without temperature and mask scan. Only person having both conditions is instantly allowed inside. The system uses temperature sensor and camera connected with a raspberry pi system to control the entire operation.

BLOCK DIIAGRAM:

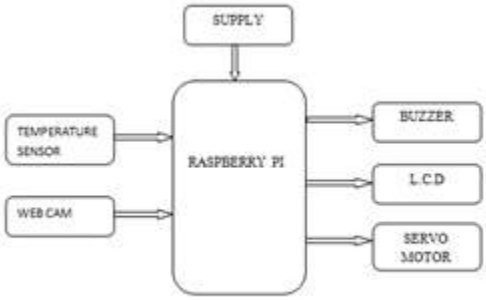

Fig 1.1 block diagram

EXPLANATION

The purpose of the project is to detect the person perfectly wearing mask or not and temperature detection of the person if the both are correct then the door allows the person in and there will be automatic sanitization these consists of temperature sensor, raspberry Pi model 3b also we are using a IOT based technology to store the data and some other

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Design Space Projects during the Academic Year 2021-2022

4. Temperature and Face Mask Scan Entry System

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Design and Development of Mobile Operated Wheel-Chair

V. Usha Rani[1], B. Indira[2], D. Manikanta[3], K. Venu[4], M. Jagadeesh[5], N. Divakar[6], S. Venkatesh[7], Sk. Tajuddin[8]

[1]Assistant Professor, Department of Electrical and Electronic Engineering NSRIT(A), JNTUK, India
[2,3,4,5,6,7,8]Students of NSRIT(A), Department of Electrical and Electronic Engineering, JNTUK, India

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ABSTRACT

Technology has made a drastic change in the medical field but there are still some people facing some problems. This wheelchair is fully automated and created especially for patients and elderly people. This is not only a smart wheelchair but also a deception wheelchair controlled by Arduino UNO with the support of some special equipment and system. This is created to solve some ridiculous problems such as physically disabled people facing problems in moving and the energy of patients being wasted in operating a manual wheelchair. Besides that, the helper becomes tired from pushing the wheelchair with the patient. Moreover, patients easily get injured while shifting from wheelchairs to bed. So, the objective of this invention is to solve the problem of three main people in one shot. They are the patients or disabled people, elderly people, and also the helper.

Index Terms – BLDC, Arduino, Blink

I. INTRODUCTION

Now a days, the mobiles have become part and parcel of everyone's daily life. Many applications can be deployed using the smart phones, with much ease. One of such innovation in the field of Medical Assistance is the Smart Wheel Chair. The Smart Wheel Chair can be operated using a Joystick operation installed in the smart mobile.

A wheelchair is a combination of chair and wheel that is widely used as the transportation but in this project, the wheelchair is focused on medical options that are designed for disabled, injured or ill person. Usage of an electrical wheelchair leads to a large amount of independence for persons with a physical disability who can neither walk nor operate a mechanical wheelchair alone as it requires great effort and the help of other people.

The purpose is to reduce or eliminate the extra person for moving a wheelchair. Usually, a smart wheelchair is controlled via a computer or electronic device sensor, which has a suite of sensors and applies techniques in mobile robotics.

Electric-Powered Wheel Chair has already been designed in [1], where there are a few drawbacks which is that the user cannot reach to the wheelchair. For that purpose, there again needs aid of another person to bring the wheel chair. The same drawback is overcome by this research. The main objective of the project is to move the Wheel Chair with help of one's own mobile to drive the Wheel Chair to them as well as move from one place to another, either by sitting on it or without sitting on it.

II. DESIGN OF WHEELCHAIR

There are various kind of Wheel Chairs in the availability. The classification of Wheel Chairs is majorly into two types. Manual and Electric. Manual Wheel chairs will require an extra effort to move the Chair. But in Electric Chairs, the power helps in moving the chair. Also, there are foldable and rigid type wheel chairs. Mostly, the rigid chairs are preferred. The rigid chairs have welded joints, with some moving parts.[3]

In Wheelchair, there are several parts. They are

1. BLDC Motor
2. Arduino
3. Bluetooth
4. Microcontrollers
5. Battery

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Makers Space Projects during the Academic Year 2021-2022

3. Design and Development of Mobile Operated Wheel-Chair

Air Quality Index Monitoring Board

Mr.A.Bala Raja Ram[1], Dr.R.S.R.Krishnam Naidu[2], S.Jaya Krishna[3] D.Pujitha Lakshmi[4]K.Pavan Kalyan[5]P.Venkat Teja[6] S.Jayashree[7]Ritik Ranjan[8] S.Jagadeesh[9]

[1]*Assistant professor, Electrical & Electronics Engineering, NSRIT, Visakhapatnam, India*

[2]*Associate professor, Electrical& Electronics Engineering, NSRIT, Visakhapatnam, India*

[3,4,5,6,7,8,9] *Students of Department of Electrical & Electronics Engineering, NSRIT, Visakhapatnam, India*

***Abstract*— Air pollution is one of the governing factor for the public health and it is the concerning part for the environment. The main objective of this paper is to provide the details about our project which is based on monitoring the air quality index of area where we live. This will help us to know in what situation we are living and what are the environmental changes that need to be made to make our live more healthy. In this paper we will show how our project compares the actual data with the predefined data. The predefined data is based on the National Air Quality Index (NQAI). In this paper concentration of various pollutants along with various harmful gases for various cities of India are also analyzed based on NAQI data and it will be easy to compare the actual data with it. This paper includes the comparison data of many Indian cities with grown alarming due to severe unsafe web of particulate matter (PM) and harmful gases present in air.**

***Index Terms:* Air Quality Monitoring, National Air Quality Index, Particulate Matter, Sensors, LED Board.**

1.INTRODUCTION

The Air Excellence Guide (AEG) may be a common indicator of air quality. The Air Quality Indicator (AQI) is calculated and supported on air pollutants like CO and NO2 compounds that consume opposing possessions happening the atmosphere and human health. The Air Quality Indicator may be a range that represents the very finest meditation of a specific air unused matter at a particular time. I propose an air quality as well as air pollution monitoring system that allows us to monitor and check live air quality as well as air pollution in an area through Internet of Things (IoT). It uses air sensors (Gas Sensor SENSOR NETWORK) to sense presence of harmful gases/compounds in the air and constantly transmit this data. In addition, system keeps measuring air level and reports it. The sensors interact with Arduino Uno (Microcontroller) which processes this data and transmits it over the application. This allows authorities to monitor air pollution in different areas and act against it [1]. In addition, authorities can keep a watch on the air pollution near schools, and hospitals areas. Normally, little concentrations area unit measured exploitation ppb (parts per billion), that represents units of mass of a material per one billion units of total mass. Parts per million (ppm) may be similar and unremarkable used unit to measure concentrations of pollutants. It determines the requirements of a new system and analyze on product and resource requirement, which is required for the successful system. The product requirement contains input and output requirements it gives the wants in term of input to produce the required productivity. The resource requirements define in brief about the hardware that are needed to achieve the required functionality. In this project I am going to make an IoT based Air Pollution Detection Monitoring System in which I monitor the Air Quality over a web server using ESP8266 Wi-Fi device and a trigger alarm when the air quality goes down a certain level means when there is amount of harmful gases is present in the air like CO2. It shows the air quality in PPM (Parts per Million) on LED BOARD and webpage so that I monitor it very easily.

2. LITERATURE SURVEY

2.1 A Comparative Study of Air Quality Index Based on Factor Analysis and US-EPA Methods for an Urban Environment:

Bishoi et al posited the EPA method for the computation of AQI (EPAQI). This technique involved the calculation other index value for each pollutant (SO2, NO2, carbon monoxide, Ozone, Particulate Matter). The EPAQI was then evaluated by determining the maximum index value of the

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Design Space Projects during the Academic Year 2021-2022

5. Air Quality Index Monitoring Board

Aerodynamic Analysis of Car body with Aerodynamic Devices to Improve Performance

V.V.R. MURTHY[1], D.K.V. TIRUMALA REDDY[2], D. VINAY PRAKASH[3], D. SATEESH[4], D. ESAKU[5]

[1]*Associate Professor, Department of Mechanical Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Visakhapatnam, Andhra Pradesh, India*
[2,3,4,5] *Student, Mechanical Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Visakhapatnam, Andhra Pradesh, India*

Abstract - *This research is about analysis of the effects of different Aerodynamic add on devices on the vehicle to reduce drag and make the vehicle fuel efficient. The 3D model is developed in ANSYS Space claim. Computational fluid dynamics (CFD) is performed to understand the effects of these add on devices. CFD is performed in ANSYS Fluent module. Drag Coefficient, lift coefficient, drag force and lift force are calculated and compared. The results are analyzed and it was observed that optimized body has better drag coefficient and lift coefficient which helps improving the fuel economy and stability of the car.*

Keywords: Aerodynamics, Drag Coefficient, Lift Coefficient, Computational fluid dynamics, Stream lined body.

1. INTRODUCTION

Aerodynamics plays crucial role in Automobile's performance. Initially, aerodynamics was used in racing to increase performance of the race cars to increase the race pace. But when fuel economy became a factor in road vehicles due to high prices of fuel, automobile manufacturers started to make changes to road cars by making them more streamlined and adding diffusers to reduce drag and improve fuel economy.

There will be different types of forces acting on a vehicle when it is moving. One of the forces that is acting against the flow of the vehicle is Drag Force. Reduction of this drag force helps in making a vehicle more fuel efficient and stable vehicle. The basic formula to calculate the overall drag is given by:

$$D = \frac{\rho}{2} C_d A V^2$$

Where,

C_d = Coefficient of Drag

A = Frontal area

V = Relative velocity of the object w.r.t. fluid medium

P = Density of air

So, our aim is to reduce the drag and lift forces acting on the car. We have analyzed 3 different models.

- Bluff model
- Streamlined model
- Streamlined model with diffuser.

And the results were noted and due to changes in the shape of the car body the drag reduction was observed which in return will increase the fuel efficiency of the car.

Computational Fluid Dynamics

CFD analysis consists of three main steps: Pre-Processing, Processing and Post-Processing. It is used to simulate fluid flow using computers with accurate results. We have used ANSYS Space Claim to design the Car models and ANSYS Fluent module to analyze the pressure contour, velocity contour, drag coefficient, lift coefficient, drag and lift forces of the models.

Concept of Streamlining

A body is stream lined when the air flow separation is low when compared to a bluff body whose air flow separation is high which causes a lot of pressure drag. A stream lined body has less pressure drag which in turn results in overall reduction in drag. A stream lined body is sleek and much easier to force such body through a fluid. So, we designed a car model with streamlined shape.

Diffuser

A diffuser, in an automobile, is a curved section of the car rear which improves the car's aerodynamic properties by improving the transition between the high-velocity airflow underneath the car and the much slower velocity in ambient atmosphere. The aft part of the car is where usually the diffuser is located. The diffuser helps in making the air flow at the exit is at the same pressure and same speed of the ambient.

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Modification of Bundle Former Piston by Failure Analysis to withstand the Fatigue

V.V.R.Murthy | G.L.Prasanna Kumar* | B.Viswanadha Raju | P.Vamsi Krishna | N.Chandradeep Varma

Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.
*Corresponding Author : Prasannakumargavara@gmail.com

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ABSTRACT

The failure analysis of bundle former piston rod with a detailed study of various reasons regarding the failures. The different approaches of design parameters are considered and suitable regulation is specified. The present work compares the results of the theoretical design calculations against the experimental work. And an analysis will be done in ANSYS Software.

KEYWORDS:Solid works, Ansys

1. INTRODUCTION

1. Description of Bundle Former

Bar Separating Unit

The steel TMT bars from the rolling mill area would be transferred to bar separating mill by means of rollers. The bar separating unit will separate the bar into discretized units from where they are separated by means of bundles. The number of bars that are allotted to a bundle would be based from the operation characteristics like the size or the diameter of the individual bar unit.

Bar Collecting Unit

The steel bars from the separating area are transferred to a collecting unit called Bar Collecting Unit. In this unit the bars from the rolling chain are made to fall into a hook shaped collecting tray operated by means of hydraulic cylinder and piston Unit. The number of bars that are collected into the tray is calculated by means of a sensor mounted on the rolling chain unit at the beginning of the bar that is falling into the tray. The Function of this collecting unit is to collect the bars falling from the separating unit and transfer the same to the rollers where the bundle former presses the bulk of bars to make it a bundle and then a strapping machine puts straps to the bundle.

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Fabrication of Water Heater/Cooler using Refrigeration system

K Abhinash | BJignas | K Siva Kumar| K Yugandhar*

Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.
*Corresponding Author : yugandharkancharapu2000@gmail.com

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ABSTRACT

This water heater cum cooler makes the study of water-cooling system using a compressor in Refrigerator system. The main aim in developing this device is to develop a multifunctional unit which can provide both hot water and cold water using the regular refrigeration cycle. The refrigeration cycle is a thermodynamic heat pump cycle which is a conceptual and Mathematical model for heat pump, air conditioning refrigeration systems.

The refrigerant R-22 /F-22 (FLORON – 22) is used as medium which absorbs and removes heat from the water and subsequently rejects the air in the atmosphere. The Main difference between this water cooler & Heater and Traditional water Heater & Cooler used domestically is this comprises of a compressor functioning of this system. Whereas, that Traditional Heater, Cooler has condenses and has 2 switches to combine working & it's a Non – Cyclic process. Their capacity is less. Circuit is different Power consumption is more. This is more effective and controllability is more. Constant refilling of water is necessary.

This is a cyclic process which uses both condenser and evaporator. Water storage space is more. Power consumption is less. Usage is easy usage.

KEYWORDS: Compressor, Refrigerant, Condenser, Evaporator, Accumulator, Water heater/Cooler.

1. INTRODUCTION

Refrigeration involves the process of removing heat from a body and cooling it to a lower temperature than the actual. Refrigerators are used for the refrigeration process.

Heat and cold are two different entities associated with temperature. Body temperature is measured by a thermometer. We prefer to wear light coloured cotton clothes when it is hot. We prefer to wear light coloured cotton clothes when it is hot. We prefer to wear dark-coloured polyester clothes when it is cold as per the weather. Heating is the process of upkeeping the heat in the body. Refrigeration is the process of cooling space.

Any substance capable of absorbing heat from another required substance can be used as refrigerant i.e. ice, water, air or brine. A mechanical refrigerant is a refrigerant which will absorb the heat from the source and dissipate the same to the sink or in the form of latent heat. The physical properties will enable them to repeat continuously a liquid to gas and gas to liquid transformation. Air was used as a refrigerant in many

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Fabrication and Performance of Thermo-Electric Refrigerator

Uda Ganesh[1], Siyyadri Vinay[2], Vallabadasu Dilipvarma[3], Gantyada Raja[4], K. Abhinash[5]

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ABSTRACT

Advancement in technological field led to the most valuable invention i.e., refrigeration and air conditioning system but its prolonged and effects the environment. CFC'S, HFC's are released from the conventional refrigeration systems which is caused major environmental issues then it results the increase in global warming. These refrigerants also deplete the ozone layer that allows the ultraviolet rays directly coming to the earth's surface and their effect is for a longer period of time. Nearly thousands of O3 molecules can be destroyed by a single molecule of the HFC and the percentage of the HFC's discharge from the conventional refrigeration and air-conditioning systems is less compared to the discharging of CO2. So that's why we created this eco-friendly refrigerator to stable the environment.

The impact of ongoing progress in science and technology the refrigeration effect is created by using refrigerants but in this system, we are using thermo-electric modules to produce the refrigeration effect. A Thermoelectric module is used in the place of compressor so that it become less weight and portable, as it is based on the principles of Peltier effect. The use of Peltier effect is to create two junctions they are hot and cold junctions opposite to each other.

1. INTRODUCTION

When the temperature gradient is passed between the two dissimilar semi-conductors, the electric current would be flow. This is known as the Seebeck effect. Jean. C. Peltier, a French watchmaker and an amateur scientist discovered a reserve effect of Seebeck. He discovered that joined metals heat pump can be made. He found that, when the electric current is passed between the two dissimilar electric conductors, caused the heat to be either emitted or absorbed at the junctions of the materials. This is called as Peltier effect and it maintains the effectiveness on both heat and cold junctions.

THERMOELECTRIC REFRIGERATOR

Thermoelectric coolers are solid state heat pumps that operate on the Peltier effect. The thermos-electric module consists of a positive and negative terminal. The theory that the electric current passes through two dissimilar conductors then there is a heating or cooling effect produced. The temperature difference is created when the voltage applied to the free ends of two dissimilar materials. This temperature difference will cause the heat so this heat is moved from one side to another side. This thermo - electric module contains an arrangement of P - type and N- type semiconductors. These elements that act as the two dissimilar conductors. The arrangement of these elements is fastened between two ceramic plates, electrically in series but thermally in parallel. When DC current passes through one or more pairs of elements from N-type to P-type, there is a drop in temperature at a cold junction, resulting in the absorption of heat from the surroundings. The heat is transfer through the cooler and released on the hot side as the electrons move from a high to low energy state. The heat pumping capacity of a cooler is proportional to the current and the number of pairs of N-type and P- type elements.

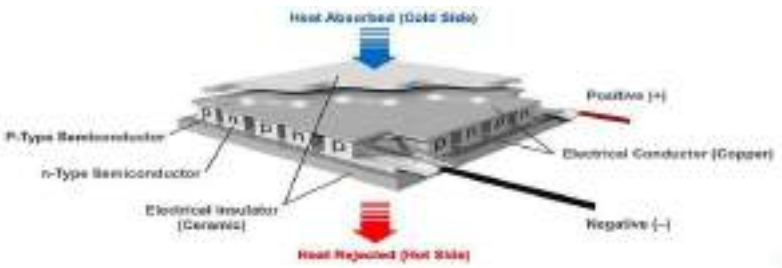

Figure 1: Diagram of a typical thermoelectric couple

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DESIGN AND FABRICATION OF ELECTROMAGNEIC BRAKING SYSTEM

N.Suneel Kumar[1],G.Gayatri[2],N.Madhu[3],P.Venkata Sai Ram[4],P.Harshit Patrudu[5]

Assistant Professor[1], B.Tech Students[2345],NSRIT,Sontyam,Visakhapatnam,AP

ABSTRACT: An electromagnetic brake is a new and revolutionary concept. These are totally friction less Electromagnetic brakes are the brakes working on the electric power & magnetic power. An Electromagnetic Braking system uses Magnetic force to engage the brake, but the power required for braking is transmitted manually. Electromagnetic braking system is a modern technology braking system used in light motor & heavy motor vehicles. This system is a combination of electro-mechanical concepts. The frequency of accidents is now-a-days increasing due to inefficient braking system. The concept helps in reducing or eliminating sources of heat generation, friction, noise, and wear of materials. There is no involvement of fluids as used in hydraulic braking systems. Electromagnetic brakes work on the principle of repulsion and attraction between two electromagnet field coils. The repulsion between the field coils opposes the motion of the wheel. This repulsion is initiated within the field coils by a switch or a lever that allows current to be supplied to the coils. Each coil is separately spaced evenly on both the outer and inner array of field coils. The disc is connected to a shaft and the electromagnet is mounted on the frame. When electricity is applied to the coil a magnetic field is developed across the armature because of the current flowing across the coil and causes armature to get attracted towards the coil. As a result, it develops a torque and eventually the vehicle comes to rest.

Introduction:

A brake is a device, where it restricts motion. It is commonly known that the brakes use friction to convert kinetic energy into heat. But the Electromagnetic brakes have been used as supplementary retardation equipment in addition to the regular friction brakes on heavy vehicles. They work on the principle of electromagnetism. The working principle of this system is that when the magnetic flux passes through and perpendicular to the rotating wheel the eddy current flows opposite to the rotating wheel/rotor direction.

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Design and Thermal Analysis on Transformer Fin Using CFD

Dwarapudi Sai Balaji[1*], Dwarapudi Ashok[2], Gondesi Gopala Reddy[3], Gandi Upendra[4], Nakka Suneel Kumar[5]

[1,2,3,4]*B.Tech. Student, Department of Mechanical Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Visakhapatnam, India*
[5]*Assistant Professor, Department of Mechanical Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Visakhapatnam, India*

***Abstract*: The design problem considers minimization of the short circuits and explosions due low heat reduction through fins. The transformer design involves the optimum transfer of heat through fins to minimize the leakage field, short circuits and explosions. While designing the transformer, original dimensions of the transformer should be taken and not consider the before used materials of manufacturing the transformer. The design of transformer involves in considering the two different materials one is alumina 96% and another one is structural steel to get the temperature distribution and temperature changes within the transformer by giving the boundary conditions of transformer including atmospheric temperature. Then compare both the materials with present used material of the transformer using software analysis. Then choosing the best material for better heat reduction (to atmosphere) through the fins (extended surface) of transformer. Generally mild steel is better than the aluminum as it in a strength. The analysis has proved that mild steel has better strength than the aluminum materials. Comparing the mild steel with the aluminum on the transformer for better heat rejection by conducting the steady state thermal analysis, transient analysis. The results of comparing these two different materials on the transformer is that the mild steel has better strength and good temperature capacity for high capacity of transformers than the aluminum. Results based on equivalent stress, static deformation and natural frequencies shows that mild steel transformer performed better in that it has high strength and good temperature bearing capacity and will deflect far less that aluminum. The aluminum materials are assigned to the transformer body and fins will become melts and damaged because aluminum has low strength and low temperature bearing capacity than the mild steel material. So that aluminum is used only for low heat sink or rejection of the fins. Mild steel is better suited for the high temperature holding transformer because mild steel is more rigid. These structural analysis results are gained through experimental work. These structural analysis results are gained through experimental work. These structural analysis results are gained through experimental work.**

***Keywords*: Transformer fin.**

1. Introduction

Transformer is a unit which helps in step up and step down the voltage. While doing the operation, transformer core gets heated up to a temperature ranging from 105 degree Celsius to 220 degrees Celsius. Transformer consists fins which helps in transmitting the heat generated inside core to outside atmosphere. If the temperature is increased beyond the mentioned temperature, even in 1 degree rise in temperature also reduces the efficiency by 50%. So, in order to minimize the loses caused to overheating, we are developed a project which can withstand a temperature ranging from 220 degree Celsius to 335 degrees Celsius. In order to get that output we redesigned the fins by changing the material as well as dimensions.

Heat transfer in transformer generally takes place in 3 modes.

1. Conduction
2. Convection
3. Radiation

Conduction: Conduction is a mode of heat transfer in which heat is transferred through direct physical contact between two or more solid bodies. In transformer this mode of heat transfer occurs in transformer core. Heat generated inside the transformer core get transferred to outside atmosphere by means of conduction.

Convection: Convection is also a mode of heat transfer in which heat is transferred within the fluid itself. In transformer this mode of heat transfer occurs within the coolant (mineral oil).

Radiation: Radiation is a special mode of heat transfer in which heat is transferred in form of electromagnetic waves. For this mode of heat transfer does not require any medium. In transformer this phase of heat transfer occurs at transformer fins and air. Heat from transformer fins is dissipated to atmosphere through radiation process.

By redesigning the transformer fins, the area of contact of fins to outside atmospheric air gets increases, due to increase in area of contact to outside atmosphere heat transfer rate increases.

In this design we make use of aluminium as transformer material, so that weight of the transformer gets reduced.

Aluminium has excellent corrosion resistant property and also has good thermal conductivity.

A. Problem Definition

Day by day number of research works are going on thermal stream to proper utilization of thermal energy.

1. Its time to proper utilization of thermal energy, cooling

*Corresponding author: 19nu5a0316@nsrit.edu.in

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Enhancement of Design and Fabrication of a Composite Automobile Body Based on Integrated Structure and Analysis of Gases using Gas Analyser

V.V.S.S.R.Krishna Murthy.Ch, Indala Sampath, Ch.Yeswanth, D. Pavan Sandeep, S. Pavan Kumar, A.V.P.Sai Vardhan, D. Vasmi, B. Guna Sekhar and B.Naresh

Department of mechanical engineering, N S raju institute of technology (NSRIT), Visakhapatnam, A.P , India

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ABSTRACT

In this project we have Designed and fabricated a Composite Automobile Body Based on Integrated Structure by ourself-interest-based racing car model. The Design of the car was carried out using CATIA software and the analysis is done by using ANSYS Software. The car was fabricated in one of our laboratories at our Institute. The car has been tested for its performance.

KEYWORDS:Composites, CATIA, Ansys

1. INTRODUCTION

A car (or automobile) is a wheeled motor vehicle used for transportation. Most definitions of cars say that they run primarily on roads, seat one to eight people, have four wheels, and mainly transport people rather than goods. Cars came into global use during the 20th century, and developed economies depend on them. The year 1886 is regarded as the birth year of the car when German inventor Carl Benz patented his Benz PatentMotorwagen. Cars became widely available in the early 20th century. One of the first cars accessible to the masses was the 1908 Model T, an American car manufactured by the Ford Motor Company. Cars were rapidly adopted in the US, where they replaced animal-drawn carriages and carts. In Europe and other parts of the world, demand for automobiles did not increase until after World War II.

Cars have controls for driving, parking, passenger comfort, and a variety oflights. Over the decades, additional features and controls have been added tovehicles, making them progressively more complex. These include rearreversing cameras, air conditioning, navigation systems, and in-carentertainment. Most cars in use in the early 2020s are propelled by an internalcombustion engine, fuelled by the combustion of fossil fuels. Electric cars,which were invented early in the history of the car, became commerciallyavailable in the 2000s and are predicted to cost less to buy than gasoline carsbefore 2025.

2. METHODOLOGY

According to the report of KPM Indian automobile industry is a developed industry that is having high opportunities when we compare among the others

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Experimental Analysis of Heat Transfer of a Fin by using Compressed Graphite Sheet

Pittala Sai Radha Krishna | D. Tulasi Ram | A. Teja Shakar | M. Rajesh | P.Upendra Varma

Department of Mechanical Engineering, N.S. Raju Institute of Technology(A), Visakhapatnam, Andhra Pradesh, India
Corresponding Author : sai.radha788@gmail.com

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ABSTRACT

An experimental investigation of heat transfer from a square fin using graphite sheets is addressed in the present work. The test has been performed on three different thickness of graphite sheet having 1mm,3mm and 6mm thickness placed in the slotted fin. The experimental setup comprises centrifugal blower, test section, heater and test panel. Results are obtained for local fin temperature distribution, rate of heat flux. The local fin temperatures of a fin with graphite sheet are higher than that of a plane square fin due to an increased rate of heat conduction. The rate of heat flux is also increased with the increase in the thickness of graphite sheet. The Effectiveness and Efficiencies of fin with Graphite sheet are also increased

KEYWORDS: Square fin, Graphite sheets, Thermal Conductivity, Effectiveness.

1. INTRODUCTION

Now a day's heat dissipation from electronic and mechanical components is the major problem. Electronic components like LED lights, CPU in computers, different electronic chips, transistors, and some mechanical devices produce heat while it is working. If this heat is not dissipating from the device properly it becomes over heated and system will have damaged and it didn't work properly. So many studies and experiments are done on this problem by using fins, heat sinks with different geometries. Typically, the fin material has a high thermal conductivity. The fin is exposed to a flowing fluid, which cools or heats it, with the high thermal conductivity allowing increased heat being conducted from the wall through the fin. Present work deals with the thermal performance of a square fin using compressed graphite sheets by using the graphite sheets the thermal conductivity of a fin can be increased which intern increases the heat conduction from the fin. Fins are the extended surfaces, which are directly or indirectly attached to the hot body to dissipate the heat by conduction, convection and radiation. Fins are used to increase the heat transfer rate from a surface to a fluid. The heat removed by conduction from body, which it is attached, then by convection and radiation from fin. The use of fins in very common and they are designed in different shapes. Circumferential fins around the cylinder of a motor cycle engine and fins attached to the condenser tubes of refrigerator are a few examples.

Heat sinks are devices that enhance heat dissipation from a hot surface, usually the case of a heat generation

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Design and Fabrication of Multidirectional Rotational Trolley

Kona Ramprasad | Golagani Satish | Pasumarthi Hari Krishna | Pangi Sathish Kumar | Penuganti Lova Raju

Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.
Correspomding Author Email Id: golaganisatish2001@gmail.com

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ABSTRACT

Normal dumper vehicle unload materials only in one direction that too only at the backside of the tipper trolley by using various powerful hydraulically operated cylinders, which may cause the problems of blockage when the work area is limited. The Multidirectional dumper overcomes the problem of unloading the vehicle on side way by using Pneumatic cylinder used in our prototype but hydraulic cylinder would have to be used in a standard vehicle. By using cylinder and Geneva mechanism the material can be unloaded in as per requirement. However, the Multidirectional dumper is developed and tested for its rotation in all 360° possible angle to unload the materials in the tipper trolley and monitor the inclinations for its gradualism by using Geneva mechanism.

KEYWORDS: 360 degrees trolley, Prototype hydraulic cylinder and truck.

1. INTRODUCTION

Material handling in construction and civil works is one of the basic necessities. The material supply to civil and construction is provided through trucks, dumper etc. The material should be properly loaded, managed, stacked, transported and unloaded. The dumper carries the material which is loaded from the site, where the material is initially stored. It is then loaded to the dumper and transported to the required site and then unloaded. The major issues raises over here, the incompatibility of the site with the fully loaded dumper causes a lot of settling time for the trolley to get the material properly arranged and transportation time to reach its location.

The dumper unloads the material in only one direction. But this incapability can be full new method mechanism as the Multidirectional dumper. Gothic mechanism is an approach to reduce the idle time to settle the dumper. The material is unloaded in any direction and hence can be boldly stated as "Multidirectional Dumper." The major outcomes of Multidirectional dumper has overcome space requirement which often result in road blocking. Hence, we have inversion in the existing mechanism providing the unloading in 3600 rotations. This mechanism prevents blocking of road, saves time and enhances productivity at lowest cost. The automotive sector is fast booming section in India. There are variable in automotive industry light and heavy motor vehicle.

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Fabrication and Experimental Analysis of Heat Sink Fins

Kona Ram Prasad[1] | R.Raju[2] | R.Balu[2] | R.Prasad[2] | S.Deva Krishna[2]

[1]Assistant Professor, Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.
[2]Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.

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ABSTRACT

In this project we had fabricated the different types of fins like circular and square. This fins made up of aluminium because it is low cost and high heat transfer rate. The experiment is carried out on fins test rig. We took the different temperatures of fins with help of this test rig and the results of this fins has been compared with efficiency and heat transfer rate. Finally, we want to conclude that which fin has high rate heat transfer and efficiency

1. INTRODUCTION

Heat transfer is the study of the flow of heat. In chemical engineering, we have to know how to predict rates of heat transfer in a variety of process situations. For example, in mass transfer operations such as distillation, the overhead vapour has to be condensed to liquid product in a condenser, and the bottoms are boiled off into vapour in a reboiler. Often the feed stream is preheated using the bottoms product in a heat exchange.

Another example is the production and use of process steam, which is brought to various locations in a plant through steam pipes as a heating utility. Also, these steam pipes need to be insulated to minimize heat loss to the ambient air. Such insulation is also important when transporting hot fluids from one place to another.

A similar application is the transport of refrigerated liquids through piping – here we need to insulate to avoid transferring heat into the liquid from the ambient air. Chemical reactors can generate heat if the reaction is exothermic, and this heat must be removed to avoid a runaway reaction; likewise, endothermic reactions need a supply of heat to maintain the reaction. Heat transfer also is important in our daily lives.

For example, we heat our homes in the winter using hot water in baseboard heaters. We boil water routinely for cooking purposes. If you look inside a modern personal computer, you'll see a fan that is used to cool the electrical circuitry, which becomes warm because of the flow of electrical current through resistances. Sometimes when the circuits are dense, a refrigerant is used in a sealed tube that is boiled at one end where it is warm, to take away the heat, and condensed at the other end where it is cooler.

The three basic mechanisms of heat transfer.

They are conduction, convection, and radiation. Next, we discuss each of these mechanisms in some detail.

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Experimental Analysis of Heat Transfer Rate by Applying Ceramic Coating on Metal Surface

Kona Ram Prasad[1] | G. Anvesh[2] | G.Mani Ram[2] | G.Prasanth Kumar[2] | G.Prudhvi[2]

[1]Assistant Professor, Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.
[2]Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.
Corresponding Author Email Id: prassu61084@gmail.com

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ABSTRACT

In this project we have study the heat transfer analysis of ceramic coating applied on stainless steel metal surface. The experiment is carried out emissivity test rig. The coating technique is used by Plasma Electrolysis Oxidation (PEO). The result has been compared to the pure stainless steel and ceramic coated stainless steel with reference of the black body.

KEYWORDS: stainless steel,ceramic coating, Plasma electrolysis oxidations,heat transfer rate, Emissivity.

1. INTRODUCTION

Energy is a core subject to education in Mechanical Engineering (ME). Among the various issues, technologies for energy recovery and conversion are at the forefront of any mechanical engineering curricula.

Heat

Heat is the amount of energy that flows spontaneously from a warmer object to a cooler one. More generally, heat arises from many microscopic-scale changes to the objects, and can be defined as the amount of transferred energy excluding both macroscopic work and transfer of part of the object itself. The process of heat, also called heating

Heat transfer

Heat transfer is a discipline of thermal engineering that concerns the generation, use conversion, and exchange of thermal energy (heat) between physical systems. Heat transfer is classified into various mechanisms, such as thermal conduction, thermal convection, thermal radiation, and transfer of energy by phase changes. Engineers also consider the transfer of mass of differing chemical species, either cold or hot, to achieve heat transfer. While these mechanisms have distinct characteristics, they often occur simultaneously in the samesystem.Heat conduction, also called diffusion, is the direct microscopic exchange of kinetic energy of particles through the boundary between two systems. When an object is at a different temperature from another body or its surroundings, heats flows so that the body and the surroundings reach the same temperature, at which point they are in thermal equilibrium. Such spontaneousheattransferalwaysoccursfromaregionof hightemperaturetoanotherregionoflower temperature, as described by the second law ofthermodynamics.Heat convection occurs when bulk flow of a fluid (gas or liquid) carries heat along with the flow of matter in the fluid. The flow of fluid

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Design and Fabrication of 3D Printer

***B.* Usha Rani[1],A. Pravallika[2], B. Tirupathi Reddy[3],G. Vinay Varma[4], D. Vinay Kumar[5]**

Assistant Professor[1], Students of Mechanical Engineering[2,3,4,5,6]Department of Mechanical, NSRIT, affiliated to JNTUK, AP, INDIA

ABSTRACT

3D printing is called as desktop fabrication. It is a process of prototyping where by a structure is synthesized from a 3d model. The 3d model is stored in as a STL format and after that forwarded to a 3D printer. It can use a wide range of materials such as ABS, PLA, and composites as well.3D printing is a rapidly developing and cost optimized form of rapid prototyping. The 3D printer prints the CAD design layer by layer forming a real object. 3D printing process is derived from inkjet desktop printers in which multiple deposit jets and the printing material, layer by layer derived from the CAD 3D data.

3D printing significantly challenges mass production processes in the future. This type of printing is predicted to influence industries, like automotive, research and development team, medical, education, consumer products industries and various businesses.

KEYWORDS: 3D printing, Rapid Prototyping, ABS, PLA

INTRODUCTION

3D-
printing or additive.manufacturing is.the construction of a three-dimensional object from a CAD model or a digital 3D model. It can be done in a variety of processes in which material is deposited, joined or solidified under computer control, with material being added together (such as plastics, liquids or powder grains being fused), typically layer by layer.

In the 1980s, 3D printing techniques were considered suitable only for the production of functional or aesthetic prototypes, and a more appropriate term for it at the time was rapid prototyping.[3] As of 2019, the precision, repeatability, and material range of 3D printing have increased to the point that some 3D printing processes are considered viable as an industrial-production technology, whereby the term additive manufacturing can be used synonymously with 3D printing. One of the key advantages of 3D printing is the ability to produce very complex shapes or geometries that would be otherwise impossible to construct by hand, including hollow parts or parts with internal truss structures to reduce weight. Fused deposition modeling (FDM), which uses a continuous filament of a thermoplastic material, is the most common 3D printing process

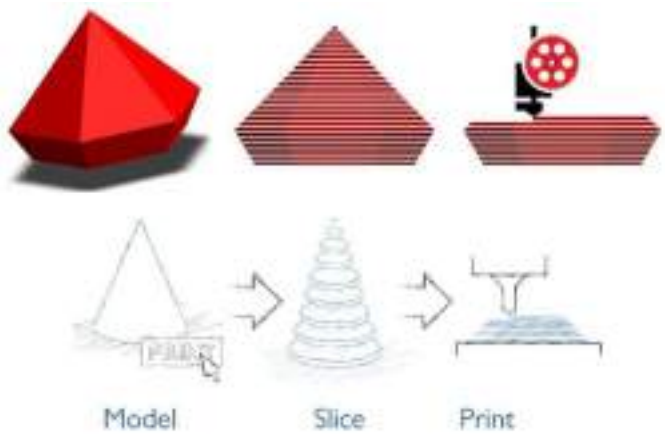

Fig : Process of 3D Printing

EXPERIMENT AND METHODOLOGY:

Our objective is to study, design and fabrication of a 3d printer. We studied the history, different printing methods and overview of the past research in the previous chapter. This chapter includes design and fabrication of the same mentioned earlier. First we ordered the whole tool-kit including all the parts and components those are used to manufacture a 3d printer. It took a while

EVALUATION OF METAL FOAM IN BATTERY THERMAL MANAGEMENT SYSTEM

B. Usha Rani[1] ,K.JanakiRao[2],Rajgopal Mahata[3],G.Krupa Raj[4],P.Kalyan Ram[5]

[1]Assistant Professor,[2,3,4,5]Students fromDepartment of Mechanical ,NSRIT, affiliated to JNTUK,AP,INDIA

ABSTRACT

Batteries, especially lithium-ion ones, are the main energy sources of electric vehicles. In order to remove the generated heat in these batteries, passive cooling systems such as those employing phase change materials (PCMs) can be used, without any energy consumption. The main drawback of conventional PCMs is their low thermal conductivity, which can be solved by adding conductive additives to pure PCM. In this study, nine passive battery thermal management systems (BTMSs) based on paraffin wax as pure PCM, and copper foam as conductive additive, but with nine different amounts (from 1 to 9 volume%), are numerically simulated to reveal the role of additive content. The results show that the addition of metal foam greatly influences the time evolution of PCM liquid fraction. It is turned out that the addition of 6 volume% copper foam can create the best cooling effect and preserves the cell in the desired temperature range. In fact, adding more than this value can significantly reduce the heat absorption capacity of BTMS and makes the BTMS unreliable.

Keywords: Conjugate heat transfer · Porous media · Battery thermal management system (BTMS) · Li-ion battery · Phase change materials (PCMs)

INTRODUCTION

ELECTRIC VEHICLES (EV)

Today,accordingtothereductioninfossilfuelresourcesandalsodangerouscontaminantscomingoutofconventionalvehicles,human is forced to design and utilize different types of electric vehicles (EVs). Lithium-ion(Li-ion) batteries are the main sources of energy in thementioned vehicles due to their high power andenergy density, long lifecycle and lowrate of self-discharge. However, the Li- ion batteries suffer from high level of heat generation while they work at high discharge rates. The excess amount of generated heat should be removed from the battery cells, otherwise it may cause thermal runaways and safety concerns. In order to remove excess generated heat, researchers have looked for effective ways to develop battery thermal management systems (BTMSs) with higher performance.

An electric vehicle (EV) is one that operates on an electric motor, instead of an internal-combustion engine that generates power by burning a mix of fuel and gases. Therefore, such as vehicle is seen as a possible replacement for current-generation automobile, in order to address the issue of rising pollution, global warming, depleting natural resources, etc

Electric Vehicle (EV)

BATTERYTHERMAL MANAGEMENT SYSTEM (BTMS)

TheBatteryThermalManagementSystem(BTMS)isthedeviceresponsibleformanaging/dissipatingtheheatgenerated duringtheelectrochemicalprocessesoccurringincells,allowingthebatterytooperatesafelyandefficiently. TheBTMS´s (BatteryThermalManagementSystem)objectiveistopreventaccelerated batterydeteriorationbymanaging theheatgenerated byitscomponentssothatitoperatescontinuouslyunderoptimumtemperatureconditions..TheBTMSisthebattery-packcomponentresponsibleforensuringthatthecellsoperateundertheoptimumtemperature conditionsspecifiedbythemanufacturer.

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Experimental Investigation of Phase Change Material on Battery Thermal Management System

B. Usha Rani [1], K. Hemanth[2], K. Ramchandrudu[3], K. Tharakeswaracharyulu[4], P. Ram Prasad[5], Ch. Chenchu Ramya[6]

[1]Assistant Professor, Department of Mechanical, NSRIT, affiliated to JNTUK, AP, India
[2,3,4,5,6]Students of Mechanical Engineering, Department of Mechanical, NSRIT, affiliated to JNTUK, AP, India

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ABSTRACT

Electric vehicles (EV) develop fast and have become popular due to their zero emission and high tank-to-wheels efficiency. However, some factors limit the development of the electric vehicle, especially performance, cost, lifetime and safety of the battery. Therefore, the management of batteries is necessary in order to reach the maximum performance while operating at various conditions. The battery thermal management system (BTMS) plays a vital role in the control of the battery thermal behavior. In this study, the paraffin (PCM) was prepared and characterized. And then the PCM have been applied in the LiCOo2 battery module for experimental research. Different discharge rate and pulse experiments were carried out at various working conditions, including room temperatures (25C) and high temperature (350c). Testing result indicated that PCM cooling system can control the peak temperature under40 I. The results exhibit that PCM cooling in battery thermal management ha promising advantages over traditional air cooling.

Keywords: Aluminum, Battery Thermal Management System, paraffin, PCM.

INTRODUCTION

As is well known, the electric vehicle is a very important alternative transportation and gains more and more attention due to the shortage of conventional fossil energy. Because of its renewable property, zero pollution, zero emission and high energy utilization, electric vehicle has become a hot research topic in the automotive industry. For that reason, the United States, China, Japan and Europe have proposed their own development plans for renewable energy vehicles. In the United States, Obama firstly proposed a commitment to reach 1 million electric vehicles in 2015 in the state of the Union address in 2011. In 2012, China released the development plan of renewable energy automotive industry and clearly stated that by 2015 and 2020, the total sales volume of all-electric vehicles and plug-in hybrid vehicles should exceed 500,000 and 5,000,000 respectively. In 2010, the Japanese government announced the "new generation of automotive strategy", which planned to by 2020 develop electric vehicles and hybrid electric "new generation vehicle" to the level that total sales accounted for about 50% of its new vehicle sales.

European major automobile country Germany, in its "national electric vehicle development plan", proposed that the total number of electric vehicles in Germany would reach 1 million by 2020. The efforts made by all countries in the world for the development of electric vehicles have led to the continuous progress of electric vehicle technology. Electric cars include three types: plug-in hybrid vehicles, pure electric vehicles, and fuel cell cars. The electric vehicle contains three main technologies: battery and its management system, motor and its controller, vehicle control technology.

The main research of battery technology is concentrated on positive and negative materials, membrane materials, additives in electrolyte, and management system of battery pack. The battery management system also includes electrical management, thermal management and safety management.

To avoid the adverse impacts of high-temperature conditions, battery systems designed for vehicle applications typically employ convective thermal management in the form of air or liquid cooling. Thermal management system designs can vary widely in complexity and in cost.

On the low end of complexity, the management system might use a small fan to circulate ambient air from the environment through the battery chamber. This approach is fairly simple and inexpensive to implement, but it might not manage heat effectively enough to permit high-rate battery use in all conditions or to prevent a sizable temperature

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Design and Fabrication of Power Generation Through Smart Speed Breakers

P N E Naveen | Shankar Mukkala | Kumar Raja Seela | Yerra. Arunkumar | Behara Teja | N.Mahesh | B.Sai Ganesh | G.Bhaskar Rao | M.Ganesh

Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.

Corresponding Author : kumarraja6530@gmail.com

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ABSTRACT

It is very significant to design pollution free energy generation system. Speed breaker Power Generator (SBPG) is the most emerging technique which produces electrical power with minimum input.

❖ *An experimental study to generate the electricity by SBPG is described in this paper.*

❖ *In this system, a Rack and pinion mechanism is used for the production of electricity.*

❖ *The rotary motion is transferred to DC generator which generates DC power which is stored in batteries same as in solar technology.*

❖ *The generated power can be used for the domestic purpose or commercially, which are present near the speed breaker. Wecantaptheenergygeneratedandproducepowerbyusingthespeedbreakeraspowergeneratingunit.*

It is observed that the generated voltage is directly proportional to the angular speed of the generator gear. Further, it is found that the total power generated from the rotational induction generators is 691 kW while that from the translational induction generators is 8.2922 kW per day on 12-hour basis.

One such example of producing power in order to provide energy for a smaller area / scale is from speed breakers cheapest and new source of energy is obtained by the conversion of one form of energy into other. The renewable sources of energy become more popular because of nonpolluting and easily available from the nature. The number of vehicles passing over the speed breaker on the road is increasing day by day. Such speed breakers are designed for heavy vehicles, thus increasing input torque and ultimately increasing the power as output. There are many suitable and compact mechanisms to enhance efficiency. The generated power can be used for the lamps near the speed breakers and this will be a great boon for the rural villages too. In this paper it is mainly focused on the working of the newly developed rack and ratchet (pinion) mechanism which is used to develop the power from speed breakers, its practical implementation.

It generates about 43 watts from one push of 65 kg weight. which can convert into electric energy by generator and later stores in batteries. In this particular study gear, rack and pinion were used for fabrication of the experimental setup. Contact stresses of rack and spur gear were analyzed under static loading and finite element analysis

KEYWORDS:Speed Breaker, Kinetic Energy, Rotational induction, Boost converter,renewable energy, Rack and pinion mechanism, Finite element analysis, Generator,Passenger Car.

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Design and Fabrication of 360 Degree Flexible Drilling Machine

Kommuri Govinda Sai | P N E Naveen | Korupolu Bharath Kumar | Kothara Naveen | Pilla Pavan Sai Kumar

Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT), Visakhapatnam, A.P, India.
Corresponding Author Email Id: govindasai.k@gmail.com

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ABSTRACT

Drilling is a cutting and material removal process in which holes are made with the help of a drill bit, often multi-point cutting tool. Drilling process involves, the drill bit to rotate at high rpm (revolutions per minute) against the surface of the workpiece.Thus, the unwanted partwill bedrilled, and the material will bedrawn from the hole in the form of chipsalong the shank. Therefore, Drilling machine is one of the machines which is very importantand is the heart of an industry. The purpose of our project is to make the drilling machine to rotate flexiblyin 360 degrees to make it more convenient. The machine is compact and by using this machine, total cycle time will be reduced and also,once the workpiece is clamped on the base plate, there is no need to move the workpiece to different locationsfor the purpose of drilling, itminimizesthenumber of machines required and human fatigue is alsominimized. With the contrast of this machine, we can drill in any direction at any angle with minimizedhuman effort. The machine is mounted on a flat surface which is supported by legs. In this drilling machine we haveused rack and pinion mechanism to move the drill in different angles, so the machine canwork in less space with efficiency.Multiple operations can be done by changing the tool in the tool holder. This machine can also be used in automation.

INTRODUCTION

360-degree flexible drilling machine is a type of drilling machine which can drill in 360-degree angle with accuracy and precision in circular cross-section. We have chosen this project as the drilling machine is the heart of any industry. It is very essential and plays a crucial role in an industry. Drilling is a cutting process in which it uses a drill bit usually multi point cutting tool to cut a hole of circular cross-section in solid materials. The drill bit cuts a hole with its sharp cutting edges and rotary motion and as the drill bit fed into the surface of the workpiece, hole will be cut. The drill bit head makes the drill bit to rotate at hundreds to thousands of rotations per minute (revolutions per minute) which makes cutting edges of the drill bit to remove the unwanted material from the workpiece along the shank.With these high-speed revolutions of the drill bit, it can cut almost any material with accuracy and precision except for rocks. In rock drilling even these high speeds and sharp cutting edges cannot make a hole just with the drill bit and the speed. Therefore, we use a hammer, the hole usually made in rock drilling by hammering thedrill bit into the hole by quick short movements and the hammering action can be

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Design of Water Heater cum Water Cooler Using Refrigeration System

T T V S R Krishna Kumar[1], B.Jeevan Kumar[2], G.Shiva[3], K.Shyam Sekhar[4], K.Naveen Subash[5]

Assistant Professor[1], Students of Mechanical Engineering[2,3,4,5,6]Department of Mechanical, NSRIT, affiliated to JNTUK, AP, INDIA

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ABSTRACT

The purpose of this study is to use water cooler and water heater to improve the convenience of the user so that they can use the water cooler and mobile water heater properly and comfortably. This study focuses on how refrigeration and water heaters use thermoelectric pads as a cooling and heating medium. Peltier works when the voltage is flowing from the power bank. The temperature difference on the surface of the processor allows the heat to occur at a fast rate. Arduinouno is used as a voltage regulator and temperature sensor to improve product performance. concept designs are designed, created and evaluated. The final prototype will include some markers that will be used as temperature readings by cooling and heating. Based on the results shown, the prototype can achieve the desired result with optimized energy consumption. When the temperature supplier produces a good temperature, the amount of water temperature will rise and the heat in the water will reach thermal equilibrium until the cold and hot temperatures reach a better minimum. Therefore, the temperatures in the cold and hot areas are more efficient in achieving thermal equilibrium in rising water.

I. INTRODUCTION

REFRIGERATION SYSTEM

The mechanism used for lowering or producing low temp. in a body or a space, whose temp is already below the temp. Of its surrounding, is called the refrigeration system. Here the heat is being generally pumped from low level to the higher one &is rejected at high temperature.

Refrigeration

The term refrigeration may be defined as the process of removing heat from a substance under controlled conditions. It also includes the process of reducing heat& maintaining the temp. of a body below the general temp. of its surroundings.In other words, the refrigeration means a continued extraction of heat from a body whose temp is already below the temp of its surroundings.

Refrigerator & Refrigerant

A refrigerator is a reversed heat engine or a heat pump which takes out heat from a cold body & delivers it to a hot body. The refrigerant is a heat carrying medium which during their cycle in a refrigeration system absorbs heat from a low temp. system& delivers it to a higher temp system.

Refrigeration Cycle

In refrigeration system the heat is being generally pumped from low level to higher one & rejected at that temp. This rejection of heat from low level to higher level of temp can only be performed with the help of external work according to second law of thermodynamics. The total amounts of heat being rejected to the outside body consist of two parts:

- The heat extracted from the body to be cooled.
- The heat equivalent to the mechanical work required for extracting it.

A refrigerator is a reverse heat engine run in the reverse direction by means of external aid.

Every type of refrigeration system used for producing cold must have the following four basic units:

• Low temp thermal sink to which the heat is rejected for cooling the space.
• Means of extracting the heat energy from the sink, raising its level of temp before delivering it to heat receiver.
• A receiver is a storage to which the heat is transferred from the high temp., high pressure refrigerant.
• Means of reducing the pressure & temp of the refrigerant before it returns to the sink.

The processes of the cycle are evaporation, compression, condensation & expansion.

By reversing the heat engine cycle completely & by changing the working agent, a refrigeration cycle is

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DESIGN AND THERMAL ANALYSIS OF THERMOELECTRIC BATTERY FOR ENERGY PRODUCTION

Vangara.Balaraju [*1], Vemulapudi.Srinivas[*2], Vemulapudi.Swamy[*3], Pilaka.Sai kiran Reddy[*4], T.T.V.S.R.Krishna kumar[*5]

* [1,2,3,4,]UG-Student, Department of Mechanical Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Sontyam,Visakhapatnam, Andhra Pradesh,India

[*5]Assistant Professor, Department of Mechanical Engineering, Nadimpalli Satyanarayana Raju Institute of Technology, Sontyam,Visakhapatnam, Andhra Pradesh,India

ABSTRACT

Currently humans are facing delicate issues, similar as adding power costs, environmental pollution and global warming. In order to reduce their consequences, scientists are concentrating on perfecting power creators concentrated on energy harvesting. Creators (TEGs) have demonstrated their capacity to transfigure thermal energy directly into electric power through the Seebeck effect. In this paper considered different types of shapes similar as blockish- leg, trapezoidal- leg, Y- leg, I- leg and X-leg, for P- N- Module all grounded on their separate shape structures along different top and nethermost contact as magnesium alloy, copper alloy, aluminum alloy all grounded on their separate thermal parcels to Optimizing the module with respect to input parameters for maximum affair parameters like current viscosity, voltage flux, temperature distribution, and remaining affair parameters using Ansys- 21 software

Keywords: Different shaped legs, different top and bottom contact plate materials like magnesium, copper and aluminium alloy, Ansys-21.

I. INTRODUCTION

The concept of thermo electricity can be classified into 2 parts. Thermo electric Coolers (TEC) and Thermo electric Generators (TEG). In order to run a TEC, a certain amount of current has to be input along with maintaining a temperature difference which gives a cooling power and the coefficient of performance of the device can then be measured. However, in a TEG, a load resistance is input along with maintaining a temperature difference and electricity is thus generated from these conditions.

THE SEEBECK EFFECT

when there is a temperature difference in a thermo electric material, an electric current is created due to movement of holes and electrons in the semiconductor materials the effect that causes this behavior is called the seebeck effect.

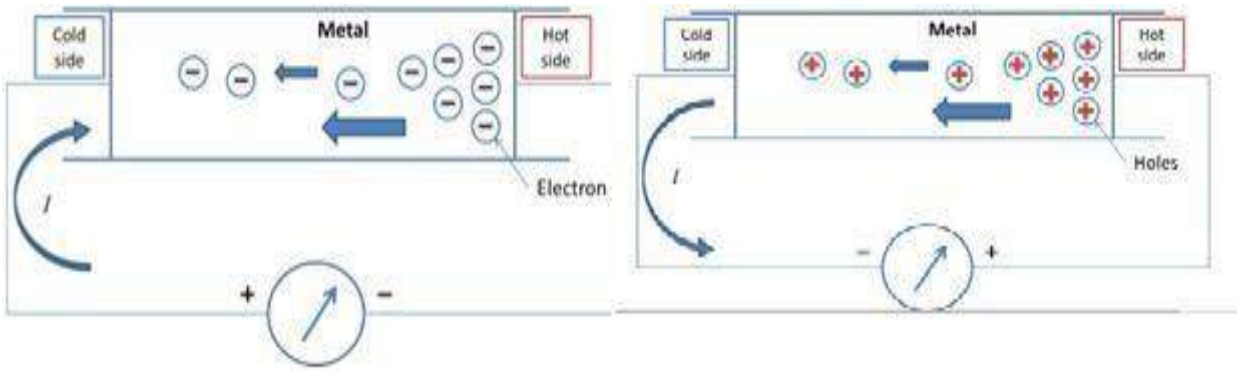

Figure1.1. The movement of (a) holes (b)electrons in the Seebeck Effect

Mathematical relation

$$V=\alpha\Delta T \qquad 1.1$$

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Application Design of an Integrated Outdoor Air Quality Monitoring Device Based on Solar Power

V. V. Ravi kumar[1], N. Sai Nishanth[2], Pawan Gopal[3], P. Devi[4], B. Nagaraju[5], S. Dileep Kumar[6], T. Mohan[7], B. Yogesh[8], G. Karthick Varun[9],

[1]Assistant Professor, Department Mechanical, NSRIT, Affiliated to of JNTUK, AP, INDIA

[23456789]Students of Mechanical Engineering, Department Mechanical, NSRIT, Affiliated to of JNTUK, Visakhapatnam– 531173, Andhra Pradesh, India

sainishanthnalla@gmail.com, ravikumar.me@nsrit.edu.in

Abstract

Pollution has rocked the world with skyrocketing pollution levels. Though the long-term solution to the pollution problem lies in finding and minimizing pollution sources, we need to bring the current pollution levels under control by the time. The best way of controlling pollution is by using air purifiers. But regular indoor air purifiers are small low power devices that don't posses enough purifying capability needed for outdoor spaces. Along with this there is also an issue of power supply in outdoor machines.

So here we design a heavy-duty outdoor air purifier that is made for outdoor purification along and powered by solar panels so it is energy independent. Our solar air purifier consists of a heavy-duty suction fan that pulls air from the bottom of the purifier through a layer of HEPA and Carbon filters for elimination of PM 10 PM 2.5 pollutants as well as gases.

Keywords: OUTDOOR SOLAR AIR PURIFIER, HEPA AIR FILTER, SOLAR PANEL.

1. Introduction

As we know that air pollution level in cities is very high. Most of pollution comes as by-product from vehicle and construction of buildings; these are in form of particulate matter which are like methane, carbon dioxide, dust particulate etc. These create a lot of health problems like respiratory illness, decreased lung functions, development of diseases like asthma etc. Larger dust particles are major particulate among these and if its air quality value is down to minimum then air has very improved quality in which all type of living things can breathe easily. Although there are many types of air purifier that are available in market but none of them are sufficient enough to deliver its working efficiency in public places like bus stand, near hospitals, traffic signals etc. Many institutes are also not able to afford these because of high cost and installation cost. Government organizations have very low budget for air purifier like extra expenditure. So, it is advisable to develop such air purifier which can cost less and are highly efficient. So, we are making solar powered air purifier, which runs on solar energy without use of filters and also works for longer duration than others. It uses component like solar panel, fan, converter, pump, etc.

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–Design and Fabrication of Emergency Braking System‖

Akala Swathi Kiran[1], Diyya Hemanth Kumar[2], Kedari Vamsi[3], Sanjeev Sunil Singh[4], Dr. P. N. E. Naveen[5]

[1,2,3,4]Bachelor of Technology In Mechanical Engineering, Nadimpalli Satyanarayana Raju Institute Of Technology, Sontyam, Visakhapatnam-531173
[5]Professor & HOD, Department Of Mechanical Engineering, Nadimpalli Satyanarayana Raju Institute Of Technology, Sontyam, Visakhapatnam-531173

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ABSTRACT

The general public, policymakers and the automobile industry have developed a growing amount of interest in automotive safety. It is more than explained by the figures on road collisions, where around 1 a year. Thanks to road traffic collisions 2 million people die. This paper introduces a cost-effective crash warning system concept for low-budget cars. Rear-end crashes are typical crash situations, and driver fatigue is a major cause of such incidents and therefore does not respond on time. No security program is a substitution for the most critical safety device of any driver's car. Many vehiclesmanufacture now use revolutionary technology for a day to help warn drivers to stop crashes and reduce possible impact speed when a collision cannot be stopped. Another such feature is Collision Warning with Automatic Braking where the area in front of the car is constantly tracked with the aid of the long-range sensor and driver is alert in the case of a collision and with the brake assist for collisions with other cars, both driving and stationary. Additionally, if the driver fails to respond given the warning and the potential collision is considered inevitable; brakes are automatically applied to stop the vehicle. This helps to reduce the level of effect and therefore the chance of repercussions. Finally, it was discussed how, using traffic incident data, the utility of these programs can be measured from the real- life safety viewpoint.

Keywords: Crash, Arduino Ultrasonic System, Automatic Braking system

INTRODUCTION

The Automatic Braking Collision Warning system is a mix of many innovations. Over the years, vehicle safety has acquired a growing attention from the general public, governments and the automobile industry. Increasing demand from the general population, governments and the automotive market. An effective means of making ongoing progress in the development of safety is a working cycle focused on real-world scenarios and input on the production of this knowledge. This working approach was found to be very successful for the production of passive protection. This research extends this cycle of working towards the production of modern active protection systems. Strong safety programs require a broader field of research and success targets, thereby extending to incident of injuries next to injury defence and adversary vehicle next to host car. The aim of this paper is to address some of the latest innovations in active protection and put them in perspective. Using blinking LED and LCD monitor, the identification of collisions is achieved by using the Ultrasonic sensor and the Stop signal. Braking is achieved by means of a servo motor attached to a parking brake lever to ensure maximum braking power and minimum braking time. Electromechanical actuation by means of mechanical actuator which makes the action extremely fast, thus ensuring safety braking. Prime mover control is cutoff by means of a relay switch to reduce power wastage and split wear. All these devices are operated using Arduino Super 2560 which is a programmed microcontroller to perform the specified function.

Overall efficiency in the improvement of an industrial boiler using COAL ACTIVATOR

Pendyala Veera Venkata Rajesh
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India
Koilada Abhinash
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India
P N E Naveen
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India

Abstract
The main objective of this project is to find out the boiler capacity and its development. The thermal industry is considered to be the major source of conventional energy in India. The chemical energy of coal is converted into electricity in a thermal power plant. It is now the most in demand industry due to high energy demand. The boiler is a very important part of the power plant. Running the plant with maximum result we need high boiler efficiency. Calculating boiler efficiency as one of the most important types of performance measurement in any power plant. For calculation of Boiler efficiency basically we use Direct and Indirect method. It is a measure of how effectively chemical energy in fuel is converted into heat energy in steam going to the turbine. We also improve boiler efficiency by using coal activator.
The art of converting plastics into useful fuels was scaled up a few decades ago, but this side is far less likely. Plastic contains most of the organic polymers made up of carbon and other elements. Various processes such as gasification and pyrolysis are used to convert plastics into smaller hydrocarbon units such as naphtha. This is named as a "COAL ACTIVATOR". This paper aims to provide the best options that will help reduce fuel (Coal) prices in the future.

Keywords: Boiler, Boiler Efficiency, Boiler Losses, Performance, Coal Activator, Direct Method and Indirect Method.

Introduction

Saving energy may the one of most interested themes and then one of the most important subjects for boiler. According to bureau of energy efficiency "thermal efficiency of boiler is defined as the percentage of heat input that is effectively utilized to generate steam." It is also defined as "Boiler efficiency is a ratio between the energy supplied to the boiler capacity and the energy received from the boiler." It is expressed in percentage. And the boiler fuel (coal) is mixed with coal activator to improve the efficiency.

Companies around the world and people started producing fuel from waste plastic. Only 8% of waste plastic is recycled in the U.S., in 15% Western Europe, and very few in developing countries, this recycling of plastic keeps it vast the amount of plastic from landfills and from the oceans. Over 500 billion pounds of new plastic made every year and almost 33% of it is single use and thrown. Since less plastic is recycled, we need it reframe plastic waste versus landfill as a less used resource destination. According to the United Nations Environment Program, global plastic consumption has gone up from 5.5 Million tons in the 1950s and 110 million tons in 2009. Due to technical limitations or inconvenience of recycling, only a portion of that material will reappear in the new plastic products. This leads to extra-normal amounts dumped in landfills for thousands of years. Pacific ocean is the largest landfall in the world: The Great Pacific Garbage Patch.

Department of Plastics The American Chemical Council asked the Earth Institute Earth Engineering Center to explore recovery paths the energy inherent in non-recycled plastics. As a

AA7xxx alloy in order to reduce the grain size of with addition of AA7xxx+0.5% SC; Study their Microstructure, Mechanical properties,Thermal properties and Stress Corrosion cracking behaviour

Siyyadri Adinarayana
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India

P. N. E. Naveen
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India

V.V. Ravi Kumar
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India

K. Ram Prasad
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India

Abstract
Purpose- In order to reduce the grain size with addition AA-7xxx+Sc alloy, study their mechanical properties, microstructure and corrosion behaviour of AA-7xxx with AA-7xxx + wt% (0.5Sc) alloys. Precipitation hardening of above conditions was investigated.
Design/methodology/approach- Precipitates at different age-hardening conditions were measured of nano scale precipitates $MgZn_2$, Al_2Cu and Al_3Sc. The precipitation hardening behaviour of AA-7xxx+0.5 wt.% Sc alloys are studied on the basis of optical microscopy, electron microscopy (SEM & TEM), XRD observations, mechanical properties and electrochemical analysis.
Findings- AA 7xxx and AA-7xxx+0.5 wt.% Sc alloys were developed casting method and comparing mechanical properties, microstructure and stress corrosion cracking behaviour ofusing 3% NaCl solution medium to understand the corrosion behaviour of alloy such as AA 7xxx and AA-7xxx+0.5 wt.% Sc ally , AA-7xxx+0.5 wt.% Sc precipitation hardened (T6) alloy.
Originality/value- Hardness, mechanical properties and Stress corrosion cracking behaviour of AA-7xxx with AA-7xxx + wt% (0.5Sc) alloys and understand the corrosion behaviour of alloy such as AA 7xxx and AA-7xxx+0.5 wt.% Sc ally , AA-7xxx+0.5 wt.% Sc precipitation hardened (T6) alloy and potentio-dynamic polarization (PDP) curves.

Keywords: AA7xxx alloys, Stress corrosion cracking, Precipitation hardening, Transmission electron microscopy (TEM), AA-7XXX+0.5%Sc.

Introduction

Aluminium alloys are prominent materials like aerospace, marine, naval and auto mobile applications. Ultra-fine grained (UFG) materials possess superior mechanical properties which have attracted the scientific community in the past few decades. These structured materials offer a significant improvement in strength without compromising ductility and toughness. In specific, AA7xxx series alloys are most recommended light weight aluminium alloy for aerospace applications due to their high specific strength, resistance to various corrosive media, etc. Proper selection of alloying additions and thermo- mechanical processing will be considered as key strengthening factors which facilitate the formation of the desirable compounds and refining

Evaluation of Thermal Properties of a Plastic Gears Composed of Sugar Bagasse Reinforced with Polyester/ Graphene Blends

P. N. E. Naveen[1*], B. Usha Rani , Borra Teja
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India[1]

Abstract
Currently, bagasse sugarcane, a waste product of the sugar industry, is mainly burned as fuel in sugar mill boilers. The low cost, low density and acceptable mechanical properties of bagasse fibre make it an ideal candidate to be considered for value-added applications such as reinforcement in plastic composites. In this by varying the composition of bagasse sugarcane with graphene as the filler material five specimens are prepared. The Structural deformation, bending stress and strain of gears with different materials are analyzed through ANSYS software. The heat flow rate on the surface of the gear tooth is analyzed with the help of CFD software under dry and wet run condition. The performance of the gears under various speeds and torques are observed in this work.

Keywords: Sugarcane bagasse, Graphene, Ansys, CFD, Heat flow rate, tooths Surface.

1. Introduction

Now-a-days natural fibers such as banana, pineapple, and flax fiber composite materials are replacing the glass and carbon fibers owing to their easy availability and cost. Natural fibers may play an important role in developing biodegradable composites to resolve the current ecological and environmental problems. Natural fibers are lighter and cheaper, but they have low mechanical properties than glass fibers. By use of hybrid fibers may solve this issue. Most of the studies on natural fibers are concerned with single reinforcement. The addition of natural fibers to the glass fiber can make the composite hybrid which is comparatively cheaper and easy to use. Natural fibers are chosen as reinforcement because they can reduce the tool wear when processing, Respiratory irritation and serves as alternatives for artificial fiber composites in the increasing global energy crisis and ecological risks. A fiber reinforced polymer is a composite material consisting of a polymer matrix embedded with high strength fibers, such as glass, aramid and carbon. The major advantages of composite materials are that they have a high ratio of stiffness to weight and strength to weight. A principal advantage of composite materials lies in the ability of the designer to tailor the material properties to the application.

2. Literature Review

Barnasree, Kumar, and Bhowmik et. al. [1] were studied wood dust particle reinforced in epoxy based composite for analysis of mechanical behavior. The sundy wood dust particle used as reinforcement and LY 556 epoxy for resin. The six different percentage of filler particle used in study. Tensile and flexural test were carried out using UTM and sample size based on ASTM Standard. The different design parameters like as filler content and speed for loading with tensile and flexural strength using GRA were optimized. Optimization by GRA has the advantage of selecting best and worst options. GRG shows that test run number 13 is the best suited and test run number 3 is the least important. Epoxy composite with 10 filler contents (wt%) at corresponding speed of 1 mm/min shows best performance and on the other hand with 0 filler content (wt%) at the speed of 3 mm/min shows the worst performance.

Dry sliding wear behaviour of WC-Co coating on Ti6Al4V using Thermal Spray coating technique

K. Raghu Ram Mohan Reddy
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India

P. N. E. Naveen, Hema Kumar
Department of Mechanical Engineering, N S Raju Institute of Technology (NSRIT) Autonomous, Visakhapatnam, A.P, India

Abstract
The titanium alloys are extensively using in defence, aerospace, automobile, chemical plants and biomedical applications due to their very high strength and lightweight properties. The most commonly used titanium alloy is the two phase Ti6Al4V. But, it has poor wear and corrosion resistance when exposed to different environment conditions. In this work, surface coatings were applied on Ti6Al4V substrate using high velocity oxy fuel (HVOF) to improve wear characteristics. The ceramic coating (WC–Co) were deposited on Ti6Al4V substrate with different thicknesses 300μm, 400μm and 500μm.
In the present investigation, hardness of both coated specimens and substrate were found by conducting Vickers hardness test. The cross sectional and surface morphology of substrate and coated system with varying thickness were made using SEM.
Pin-on-disc tests are performed for evaluating sliding wear behaviour of substrate and coated system where the counter disc was made of chrome steel. Wear test was carried out at different sliding distances of 1000m, 2000m, 3000m and 4000m at a constant load of 50N and the disc speed was recorded as 600rpm. The mass loss of substrate material and coated system was measured for all the test conditions to demonstrate the wear behaviour. SEM analysis showed the wear behaviour of coated and uncoated samples. The mass loss of the above test conditions expressed that the coating system found to be better improvement in wear resistance of substrate. However, the thicker coat samples (500μm) shows maximum hardness and highest wear resistance.
Keywords: Ti6Al4V, HVOF, WC-Co, wear, hardness.

1.Introduction

Thermal sprayed coatings are used in a wide range of other applications such as the gas turbine, petroleum, chemical, paper/pulp, automotive and manufacturing industries. Metals, carbides and cermets are the most widely used coating materials. The most familiar thermal spray techniques such as high velocity oxy fuel (HVOF) process and detonation spray (DS) or detonation gun (D-gun) spraying system. Selection of coating material, coating technique and the process parameters is an important factor, which influence the tribological performance.

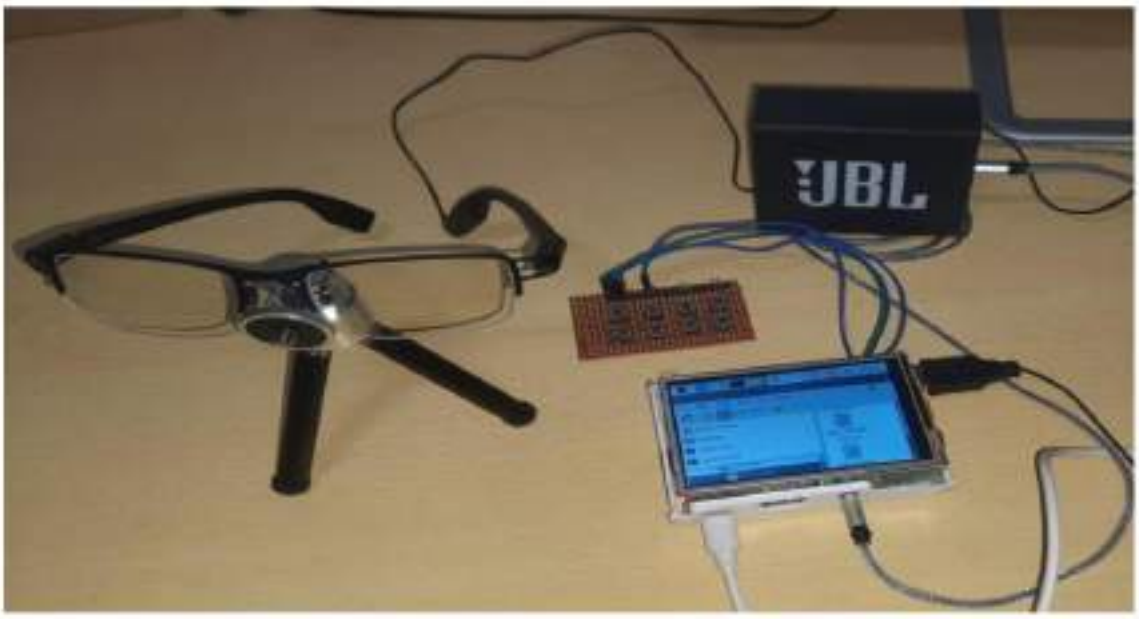
2.Literature Review

Tungsten Carbide with different compositions of Cobalt such as WC–12%Co, WC–20%Co and WC–6%Co coatings were deposited on steel MoCN315M by Y. Wang [1] using D-gun spray and plasma-spray.

Surface coating technology can efficiently and economically improve the properties of metals such as wear resistance, corrosion resistance and high temperature oxidation resistance, etc. [2,3]

M. Magnani et al. [4] fabricated WC–Co coatings on an AA 7050 aluminium alloy using HVOF technology to improve wear resistance. H. Zhang et al. [5] deposited WC–24% Cr3C2–6%Ni coatings by HVOF. They reported that the thermal spray cermet coatings improved wear resistance compared to the substrate material.

Prototype device interfaced with USB Camera



Prototype device interfaced with Spectacle Camera

Projected view of Hardware features

GAME DEVELOPMENT

Mr. K.HARSHA VARDHAN SRINIVAS[1], Mr. DEEPAK PEMMISETTY[2],
Mr. DEBASHISH NANDI, Mr. S.MIRZA DUWAL ALI BAIG[4] , Mrs. R. PRIYA VAIJAYANTHI [5]

[1] *BTECH*, NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY PENDURTHI-ANANDAPURAM RD, HIGHWAY, SONTYAM, ANDHRA PRADESH 531173.
[2] *BTECH*, NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY PENDURTHI-ANANDAPURAM RD, HIGHWAY, SONTYAM, ANDHRA PRADESH 531173.
[3] *BTECH*, NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY PENDURTHI-ANANDAPURAM RD, HIGHWAY, SONTYAM, ANDHRA PRADESH 531173.
[4] *BTECH*, NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY PENDURTHI-ANANDAPURAM RD, HIGHWAY, SONTYAM, ANDHRA PRADESH 531173.
[5]ASSISTANT PROFESSOR OF COMPUTER SCIENCE AND ENGINEERING, NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY PENDURTHI-ANANDAPURAM RD, HIGHWAY, SONTYAM, ANDHRA PRADESH 531173.

Abstract— *In today's world, games are a $200 billion industry, with highly skilled developers working around the clock to create interactive works of art. Project Rescue is a third-person shooter with a strong focus on gameplay and originality. The scenario takes place in space, with a large number of "invaders" attempting to take over the spot where you are. The goal of the game is to eliminate the invaders while keeping your location safe. The game should be adapted to PC devices and made available through the appropriate shop. The game must be able to be expanded in the future for updates and makeovers. The project participants will source all of the assets used in the project. The project concept must include the ability to add multiplayer functionality and the ability to add new levels in the future. The assets and game components must have a "space style" art style, similar to Warframe. The game's size must be lowered to fit the mobile space, and assets must be added from scratch. Except for the PC version, which must adhere to graphical quality criteria. Project Rescue will hopefully provide us with the opportunity to break into this business and make a bold move toward combining our passion and future chances.*

Index Terms—War frame PC Device Graphical quality

I Introduction

Project Rescue is a first-person shooter game for one player. This game is available for the PC and Android platforms. With its Shooting Hack & Slash sort of gameplay, this game is designed to be intense while still being a stress-relieving way of entertainment. With a scenario situated in space, there are a slew of invaders who are now computer AI designed to behave as foes. The game's assets and components were entirely created from scratch or obtained from a free open-source platform. The game is also built in such a way that the developers should be able to add new features in the future. There will also be several levels enabling players to modify the game's rythm. As well as the combat's ferocity. The game's

combat style is basic, with little to no stealth, but it will also contain Hack and Slash undertones, giving it a fresh feel.

Project Rescue is a game that takes place in space. First Person Perspective, Shooting, Space, and Single Player are the game's genres. The team's game is designed to provide gamers with an intense yet comfortable gameplay experience.

This project also aims to reconstruct all of the world's needed physics systems, resulting in a far more realistic experience. The AI in the game was created from the ground up and is completely unrelated to the gameplay premise. Customized 3D objects, sounds, and music are also used in the game.

textures and shaders that aid in the compression of the game's size in terms of storage. The game is also built in such a way that the developers should be able to add new features in the future. This will allow the game's developers to add more content in future releases. The game presently has numerous levels that the user can play, each with a different geography and gameplay. The fighting system should be simple to use and enjoyable to play, with a fast-paced experience. The game must load quickly, allowing for minimal wait times and a seamless experience.

3rd online Virtual Alumni Meet July 17th, 2022 (Sunday)

3rd Online Virtual Alumni meeting of NSRIT Alumni Association (NAA) was assembled on July 17, 2022, at Zoom Platform.

In the meeting Principal Dr. M.A. Khadar Baba, Director Dr. J. Raja Murugadoss, Treasurer Shri N. Kanaka Raju, General Secretary Dr. N. Prasada Raju, TPO Shri D.D.P. Varma and all HODs with Senior Teaching Faculty members were present.

In the beginning Mr. K. Shankar Coordinator of NSRIT Alumni Association (NAA) welcomed all the members. Presented 15 min presentation for NSRIT and the main thing the coordinator said that the NAA has opened the Wall Of Fame for the alumni. Around 150 frames of the alumni are kept on the Wall Of Fame.

Dr. Raja Murugadoss directly pointed about principal views that students and Alumni are the complete backbone of the Academic institutions. He gave a brief presentation how the Alumni can contribute to this institution for spending of 4 years

of lifetime at NSRIT. In the presentation he talked about NAAC, Placement offers, Alumni engagement, Merit Scholarship Schemes, Online courses and Online certification. He spoke about the placements the students are getting in third year itself, the IT companies which are on board. He also spoke about NSRIT Radio which will be implemented in the upcoming days. He then concluded with thanking the institution and NSRIT Alumni Association.

After the Director's speech , the interaction between the Alumni started.

Sandhya Alumni of CSE Department shared her journey in with members in the meet. She has been relieved from the institute in the year 2018. She was placed in HCL in the same year 2018. She has worked in HCL for 3 years and then she moved to LNT Infotech, she is working as a engineer and has been promoted to a senior data analytic engineer. Then she concluded by saying thanks to the institution for giving her this opportunity.

Shivam Rai Gupta Alumni of ECE Department has shared his experiences after he got relieved from the NSRIT institution in the year 2015. He is currently working as Lead Developer in Axentro Technologies. He first started off with a small level company which hardly had 300 to 350 employees. So, he started as Data Warehouse Engineer in Interdata and then switched to Data Engineering Bit Data Hadu and now he is in Data Science were he works in Data Science Consultants. He suggested his juniors to do other courses in online as there are plenty of opportunities for you. He advised to concentrate more on Data Science as there is a lot of demand for Data Science in the outside world. He is also doing his Masters in AIML from Upgrad. He the thanked the institution for giving him this opportunity to share his memories.

Dinakar Alumni from CSE Department shared his memories after he graduated from NSRIT institution. He shared a lot of things about placements and about how different companies look for different requirements, like checking the company website before attending the interview and all. He encouraged his juniors to work hard and not to get discourage if you didn't achieve the goal you wanted to, just give it an another try until you get it. These were his encouraging words. He also congratulated the institution for getting NBA and for the institution being Autonomous. That was all from his side.

Prasad Alumni from Mechanical Department shared his views on his life has been after he graduated from NSRIT institution. He is currently being working in Amazon. He also said about how the Mechanical students think that they will not place in IT Companies but that's not the case from him at all. He also added that there are a lot of job opportunities in IT Companies for non-IT jobs. He also said that there is no need to always start first in an small IT Company then you can switch to other companies, you can actually start at a big company.

Sudhakar Alumni from EEE Department who graduated from NSRIT institution in the year 2013. He shared a few moments for his memories. He got selected in VisionTech in a campus interview. Now he works in a Xilinx SemiConductor Company. He suggested his juniors to get a strong hold on basics of whatever you do, as basics of anything will help a lot. He also said to give best and be best in whatever you do, even if it is testing be good in it, if it is coding you be best in it.

Revathi Alumni from ECE Department, relived in the year 2017, she shared her experience on how difficult it was for her at the starting of her training period, how she was all frustrated and pressured on how to do these things. She thanked her faculty for giving her advice on how to stick on what you did for years, how the faculty advised her what to do after she graduated from the institution. She even thought a lot of times to give up on her carrier as she was struggling a lot and couldn't take it anymore. But she had a hold there and thought to herself that I shouldn't give up. She suggested that work hard no matter how hard it gets for you and never give up. She then thanked the institution for giving this opportunity.

Surya Alumni from EEE Department, he shared his memories on how he got placed. He is now working in Access Global Automation which is the core company for he studied for 4 years. He suggested the college to develop more lab facilities on different types of courses. He then thanked the institution for giving him this opportunity.

Suresh Alumni from EEE Department, shared his views on how his life as been after his graduation from NSRIT institution. He got relived from the institution in the year 2018. He currently works as a Application Engineer in Access Global Automation. He was thankful to the institute for providing lab facilities to their core subjects and how the faculty helped him in his hard times. As he works as an application engineer, he talked about robotics and how the company works on it. He then talked about how strong you have to be with your subjects, and no matter which side you go you have to learn automation, then if you want to go for IT Company you apply Automation to Java or Python or any other language. He then thanked the institution as he got selected in the company by an On Campus Interview. He showed us how he works there, this is how he works. With that he the thanked the Institution for conducting this meet.

Naga Suresh Alumni of ECE Department, shared his experience about his journey. He got relived from NSRIT Institute in the year 2019. After his graduation he once visited the institute and thought to himself that why he was not studying now. He met the faculty, and he was so impressed on how they treated him with same energy on the day he left the college. He said that no matter what type of engineer you become every engineer is important in then real world. He told how he never give up even tho he attended 64 interviews and in all he got rejected. Now he is working for HPCL Barmer Rajasthan Plant which is now of 40 to 50,000 cores project. He then thanked the institute for conducting this meet.

Shiva Rama Krishna Alumni from ECE Department, he got relived from the NSRIT Institute in the year 2014. He currently works in TCS in New Delhi. He has experience of 6 years, in his past 6 years he worked in 3 MNC Companies. At first, he started working in LNT, he worked there for 3 years then he got switched to Samsung Manufacturing which was held in New Delhi. Then he got switched to TCS. He shared how different is every IT Company. Then he thanked the Institution from giving him this opportunity.

Divakar Alumni from ECE Department, shared his views on how the outside world is. He is now currently working as a Problem-Solving Infrastructure Engineer in HCL for more then 2 years. He shared how he got selected in 6+ Companies and how he uses to crack every single Interview he faced. The only thing he did is, he believed himself and thought himself to be confident enough to face anything. He got selected as a highest paid intern of 7 lakhs package from the institute. He also told how the companies select and what they require from this engineer and all they see is how confident you are and how your communication skills are. With that he thanked the NAA for conducting this meet.

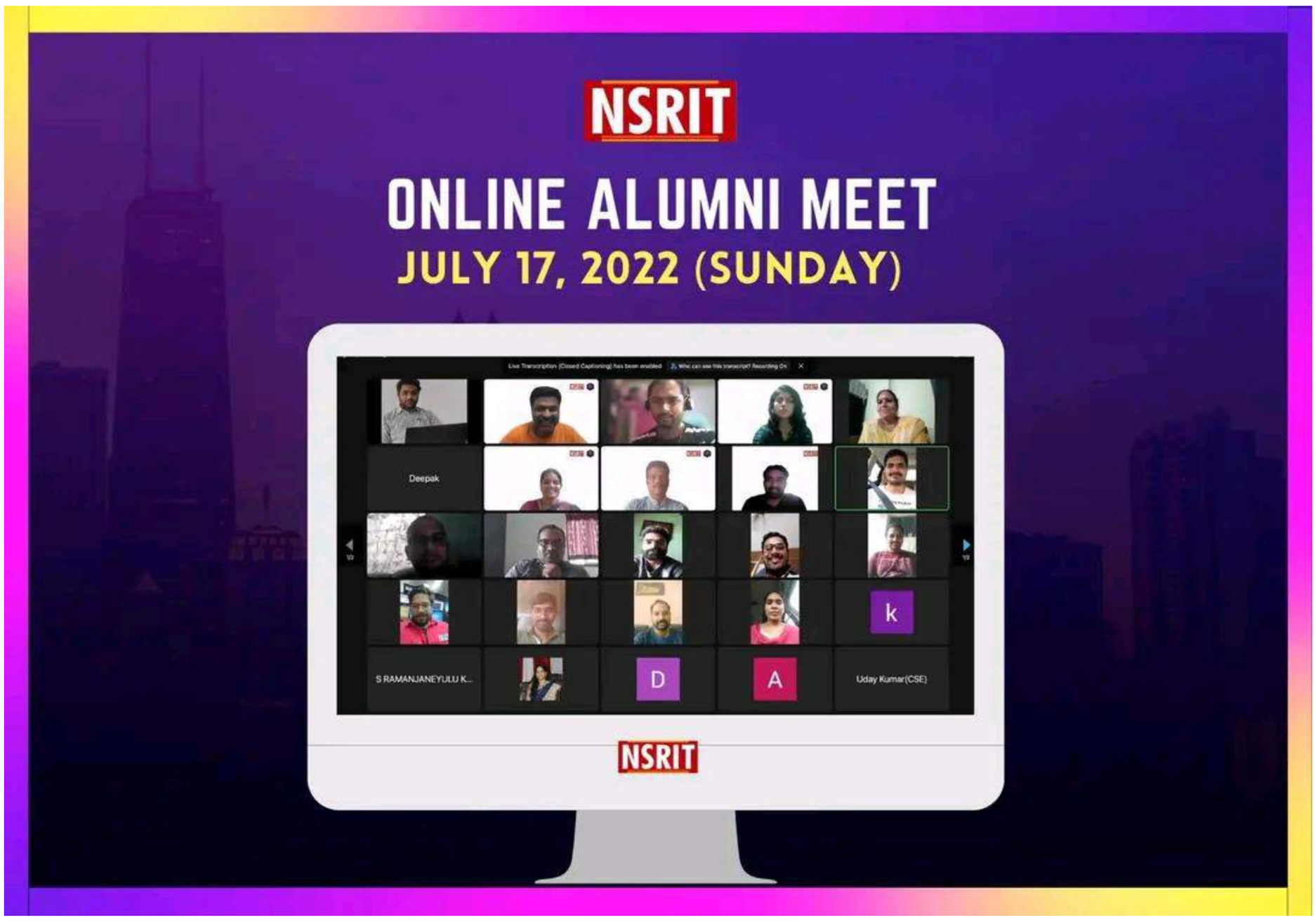
Pavan Alumni from ECE Department, who got relived from the NSRIT Institute in year 2020. He is now currently working in Tech Mahindra as an Associate Software Engineer. He said how he studied in Electrical Engineering and now he is working in IT Company. He shared his experience on how his batch was the last batch to spend every year in the Institute as after that the Corona has started. He also said how encouraging the faculty were in the Institute, how they used to do projects (like Electrical car, Robotics). Then he thanked NAA for conducting this meet.

After the interaction between the Alumni, our Secretary Mr. Prasad Raju thanked the Coordinator Mr. Shankar for conducting this meet, he basically thanked the covid situation as all the Alumni from different States and some even from Abroad can

connect through. He thanked every Alumni by saying that they are the Institutes brand ambassador' s as they have landed there footprints in every corner on the Country.

Treasurer Mr. Kanaka Raju gave this thanks to every Alumni who voluntarily cam to participate in the Alumni Meet.

Finally vote of thanks is given by the Ms. Prasathi, HOD of CSE Department and the event is closed with National Anthem.



3rd Online Alumni Meet

July 17th, 2022(Saturday) @ 10:30 AM

PROGRAMME SCHEDULE

10:30 AM-10:35AM	-	Welcome Address Mr. Shankar Alumni Coordinator
10:35 AM-11:00AM	-	College Presentation Dr. J. Raja Murugadoss Director
11:00 AM-11:45AM	-	Interaction with Alumni
11:45 AM-11:55AM	-	Special Address Dr. N. Prasad Raju Secretary
11:55 AM-12:00AM	-	Presidential Address Shri N. Kanaka Raju Treasurer
12:00 AM-12:05AM	-	Vote of Thanks Mrs.M.Prsanthi

Timestamp	Name	Branch	Passed Out Year	Mobile Number	Mail ID	Present Working	Designation	Location
8/25/2021 15:38:34	Shaik	Cse	2021		Test	Test	Test	
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9/28/2021 10:45:18	ABOTHU YERRI NAIDU	MECHANICAL	2021	9347856077	yerrinaiduabothu225@gr	No	B.tech	Bheemannadorapalem
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9/28/2021 11:05:10	Nadigatlla Vinay bhaskar	Mechanical	2021	8501992771	vinaybhaskar423@gmail	N/A		
9/28/2021 11:30:09	BAILAPUDI SIVA PRASA	MECHANICAL	2021	8309999082	sivaprasad86928@gmail.com			VISAKHAPATNAM
9/28/2021 11:41:19	Kota Anantha rao	Mechanical	2018	9154041314	Kananthsaisri@gmail.cor	Telangana POLICE depa	HYDERABAD city POLIC	HYDERABAD
9/28/2021 12:20:37	Allu sravan kumar	Mechanical	2019	9502504056	Sravankumarallu2@gma	Smart village planning de	Mandal executive	Narsipatnam

Timestamp	Name	Branch	Passed Out Year	Mobile Number	Mail ID	Present Working	Designation	Location
9/28/2021 12:31:41	B Manikanta akash	Mechanical	2021	8639842943	manikantaakash930@gm	HOBEL BELLOWS	Trainee Engineer	Visakhapatnam
9/28/2021 12:33:10	WUNNA MANIKANTA	MECHANICAL	2021	7013459602	mani6068078@gmail.cor	HOBEL BELLOWS	TRAINEE ENGINEER	VISAKHAPATNAM
9/28/2021 16:51:48	BONI JAGAN	Mechanical engineering	2021	7036962383	jaganboni@gmail.com	Not working		Visakhapatnam
9/28/2021 16:55:25	Kolagani Srinu	Mechanical	2020	9912653612	srinukolagani058@gmail	Trivitron healthcare pvt L	Production executive	Visakhapatnam
9/28/2021 17:09:49	Thamatam venkatesh	Mechanical	2019	7416673145	Thamatamvenkatesh36@	Airtel-territory sales mana	TSM	visakhapatnam
9/28/2021 17:11:07	BANDARU MANOHAR	Mechanical	2021	9704621960	manulovedad111@gmail.	Practically	Jr. BDA	Visakhapatnam
9/28/2021 17:28:14	Dhinakar Reddy Pothired	CSE	2014	9494916631	dhinakarreddyp@gmail.c	Agusth	ECM Consultant	Hyderabad
9/28/2021 17:33:45	OLLEPU RAMBABU	Mechanical	2021	7780341555	ollepurambabu@gmail.c	70	Mech	Visakhapatnam
9/28/2021 18:02:49	Amulya Vavilapalli	CSE	2015	8885822290	amulyavavilapalli94@gm	Randstad Offshore	Talent Onboarding- Train	Vizag
9/28/2021 18:28:06	VOMMI VENKATA BALA	Mechanical engineering	2021	7799888044	venkatabalaji02021999@	7799888044	Graduate	Visakhapatnam
9/28/2021 21:10:08	pramod kumar setty	cse	2012	8801186003	pramod.pkrdi@gmail.con	oracle		hyderabad
9/28/2021 21:45:42	Shivaprasad	Mechanical	2020	9666916228	cvacherryweb@gmail.co	Business	CEO	Vizag
9/28/2021 21:50:23	Gurava Reddy Boreddy	EEE	2012	9492822363	reddy6985@gmail.com	Self Employ		Visakhapatnam
9/28/2021 21:52:23	Sabbarapu bharath kuma	Mechanical	2020	7702708480	bharathbobby25@gmail.com			Visakhapatnam
9/28/2021 21:54:20	Vegi Aravind Kumar	Mechanical	2020	9885535035	vegiaravind988@gmail.c	Yes	Agent	Visakhapatnam
9/28/2021 21:57:00	Rowthu jaya krishna	Mechanical	2021	7036096086	jkrouthu2013@gmail.com	No	No	Vso
9/28/2021 22:00:05	L V M M RITISH KOUSH	Mechanical	2021	9618105507	koushikritish2000@gmail.com			
9/28/2021 22:00:28	B. Vinod Kumar Reddy	Mechanical	2019	7732025883	bvkr7997@gmail.com	ICICI BANK	Value banker	Hyderabad
9/28/2021 22:03:48	Nambaru Eswar Kumar	Mechanical	2020	7386888677	eswarkumar063@gmail.c	Hobel bellows	Junior Engineer	Vsez duvvada
9/28/2021 22:04:48	Kollipaka naresh	Mechanical	2021	7981016218	danielnaresh25@gmail.c	Seoyon e-hwa summit	B.tech	Visakhapatnam
9/28/2021 22:05:10	Kalimisetti chakradhar	Mechanical	2021	8309101456	kalisettichakri70@gmail.c	Nill	No	No
9/28/2021 22:07:50	SHAVUKARU RAVI KIRA	MECHANICAL	2020	8978370029	shavukaruravikiran@gma	Hobel bellows Co.	Trainee engineer	Visakhapatnam
9/28/2021 22:09:41	MEESALA CHAITANYA S	MECHANICAL ENGINEE	2021	8106521167	chaitumeesala123@gma	Practically	Jr. Business Developmer	Visakhapatnam (work from home)
9/28/2021 22:10:28	Mutha Sai Tarun	Mechanical	2020	8019518351	saitarun0817@gmail.com	No		Visakhapatnam
9/28/2021 22:13:15	Akula Chandra Mouli	Mechanical	2020	9160527173	moulichandra450@gmail.com			
9/28/2021 22:17:01	Allada mahesh	Mechanical	2021	6264301959	maheshallada002@gmai	Hetero	Jr supervisor	Nakkapalli, vishakapatnam
9/28/2021 22:21:11	MULAKALAPALLI MANC	Mechanical Engineering	2020	9640753880	manojmech031@gmail.c	Radhe Shyam Honda Au	Sales Manager	Visakhapatnam
9/28/2021 22:22:16	N V S RAVI VARMA	MECH	2020	9160711302	nvsravivarma1996@gma	Vasudha Pharma Chem L	Gr.trainee	Vizag(atchuthapuram)
9/28/2021 22:33:18	Pinnapuralla Raju	Mechanical	2021	7013510518	rajupinnapuralla9447@g	Yes	Trainee engineer	Viskhapatanam
9/28/2021 22:35:18	Pavan satya	Mechanical	2019	9640899123	pavansatya79@gmail.co	SGK.EPC	Piping Engineer	Hyderabad
9/28/2021 22:49:40	Kishore	Mechanical	2019	9705324332	Koiladakishore16@gmail	Hpcl	Inspection	Vizag
9/28/2021 23:22:27	Murukithi Jogendrakuma	Mechanical	2020	8317697089	jogendrakumar1111@gm	Hobel bellows	Btech	Visakhapatnam
9/28/2021 23:43:04	TANAKALA MANIKANTA	MECHANICAL	2020	7671097126	manikantasantoshtanaka	Yes	Trainee Engineer	Visakhapatna
9/29/2021 6:05:55	G naveen	Mechanical	2021	8247822005	gidijalanaveen712@gma	TVS	Trainee	Chennai
9/29/2021 6:39:42	CHINNI LOHITH	MECHANICAL	2020	7013869894	lohithchinni1998@gmail.com		Mechanical Engineer	Visakhapatnam
9/29/2021 6:54:56	CHOPPA VARAHA SATY	Mechanical	2020	7036556442	venkateshchoppamech@	BUYERINTEREST ONLI	Chief operating officer	Jagadamba Visakhapatnam
9/29/2021 7:12:15	Balaga Eswar	Mechanical engineering	2021	9640538432	eswar22448@gmail.com			
9/29/2021 7:38:43	J Naga sanjay bhargav	Mechanical	2021	9550888968	Jnsanjay2000@gmail.co	Yes	Neem trainine	Gumidimpoondi
9/29/2021 7:46:31	POLAMARASETTI MOU	Civil	2021	9502103227	Polamarasettymounika59@gmail.com			
9/29/2021 8:58:35	LAXMAN dheeraj	Civil	202	9618314996	lakshmandheeraj1999@	Hindustan aeronautics lin	Trainee	Banglore
9/29/2021 10:31:29	I HARIDHAR VARMA	ECE	2021	6301518320	varmaraju0010@gmail.c	Vlsi Training	Trainee	Visakhapatnam
9/29/2021 10:32:27	Nagisetty chaitanya	ECE	2021	9182585201	chaitanyanagisetty5@gm	No	Student	Vishakapatnam
9/29/2021 10:33:47	Uppala.Jaya Bharathi	ECE	2021	7075322890	uppalajayabharathi@gma	IELTS Preparation	Student	Visakhapatnam
9/29/2021 10:47:39	P.Razkumar	Electronics and communi	2021	8919364612		Tech mahindra	Associate software engineer	
9/29/2021 11:03:49	Bvk mohan	Ece	2021	9182177652	krishnamohanbvk4@gmail.com			
9/29/2021 14:32:16	D.Chandra Mouli	Mechanical	2021	9652636209	darlingchandudakarapu0	No		Chodavaram
9/29/2021 15:48:33	Bora Harika	ECE	2018	7036505488	bora.harika97@gmail.cor	No	Intern	Visakhapatnam
9/29/2021 16:32:47	PAVAN KALYAN	EEE	2021	7286936090	kalyan.pavan1312@gma	No	No	Vishkapatnam
9/29/2021 19:35:52	Vadlamani Dinakar	Cse	2018	8500641755	dinakar.chinna9@gmail.c	Accenture	Software engineer	Hyderabad
9/30/2021 0:04:07	GARIKINA HESA	ECE	2021	8919462415	hesagarikina@gmail.com			VISAKHAPATNAM
9/30/2021 10:45:31	Khanderayani V M Swara	Mechanical	2021	9398615120	tarakvms.226@gmail.cor	No	No	No

Timestamp	Name	Branch	Passed Out Year	Mobile Number	Mail ID	Present Working	Designation	Location	
9/30/2021 12:28:09	S. Jahnavi	Civil Engineering	2021	9440588531	jahnavisikhaa2000@gma	Competitive exams	Under Graduate	Visakhapatnam	
9/30/2021 21:20:22	Devika Priya	Ece	2016	7989144313	priya94.devika@gmail.co	Curia GSS (formerly Alb	AP Associate	Visakhapatnam	
9/30/2021 22:00:09	B Sivaji Dinesh	ECE	2015	7075656241	bandaluppi.sivaji@gmail.	eSupport Solutions Pvt L	Network Support Enginee	Hyderabad	
9/30/2021 23:25:46	K. Sai adithya	Mechanical	2020	9182402442	kuppannagariadithya@gı	No	-	Vizag	
9/30/2021 23:32:13	Gorle Harshavardhan	Mechanical	2021	799543804	Gharshavardhan2@gmail.com			Vishkapatam	
10/1/2021 9:40:11	Vamsi Sagi	ECE	2020	9133684314	sagivamsi24@gmail.com	Capgemini	Analyst	Bangalore	
10/1/2021 11:14:24	Bhavani	ECE	2016	8886933299	bhoni419@gmail.com	Digicomm semiconductor	Sr.Analog layout designe	Bangalore	
10/1/2021 17:32:58	Gorrela venkata Sai yath	Mechanical	2020	7679941354	yatishgorrela@gmail.com	No			
10/1/2021 19:21:41	Vedula Aswani	ECE	2016	9491322068	vedulaaswani444@gmail	NSRIT Engineering colle	Assistant professor	Visakhapatnam	
10/1/2021 20:27:42	B.Harika	CSE	2021	8639294232	harikabrundavanam2000	TCS	Assistant system enginee	Banglore	
10/1/2021 22:28:51	Silaparasetty Ashok	EEE	2021	8096708199	ashoksrinuvas@gmail.co	-	-	-	
10/1/2021 22:41:39	Vishnu Priya Konkipudi	Ece	2020	6301580378	priyakonkipudi964@gma	Atos Global It Solutions	Analyst	Pune	
10/6/2021 23:53:26	Hemanth	Cse	2025	7288829958	pottibangaram764464@g	Student	My dream is to High	Srungavarapukota	

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Experimental Investigation On Design Of Flexible Pavement

S. Lovaraju[1], U. Deepika[2], A.Chiranjeevi[3] , D. Bhargav[4], S. Charika[5] , T. Jyothi Kiran[6]

S.Lovaraju[1] Asst.Prof Civil Department & Nsrit College
U.Deepika[2] Student Civil Department & Nsrit College
A.Chiranjeevi[3] Student Civil Department & Nsrit College
D. Bhargav[4] Student Civil Department & Nsrit College
S.Charika[5] Student Civil Department & Nsrit College
T. Jyothi Kiran[6] Student Civil Department & Nsrit College

ABSTRACT-

Pavements are required for the smooth, safe and systematic passage of traffic. Pavements are generally classified as flexible and rigid pavements. Flexible pavements are those which have low flexural strength and are flexible in their structural action under loads. Rigid pavements are those which possess note worthy flexural strength and flexural rigidity.

The profound development in automobile technology has resulted in heavy moving loads on the existing highways for optimization of the transport cost. In the project report, an attempt is made to design a road near Sontyam, based on the principles of pavement design. On the existing alignment of the road, soil samples are collected for the determination of soil characteristics like consistency limits, sieve analysis, C.B.R. values etc.., Based on this the thickness of the pavement (flexible) is designed. The alignment of the road is also designed and fixed by surveying and leveling. The total road length being 497 meters of which, one section is 247m, other is 200m and the third section is 50m.

***Key Words*:** Flexible Pavement, Bitumen, Base course, Wearing course, Highway

1. INTRODUCTION-

For economic and efficient construction of highways, correct design of the thickness of pavements for different conditions of traffic and sub-grades is essential. The science of pavement design is relatively new. In India, previously road crust was designed on some rational data but more on the experience of the road engineer.

Some arbitrary thicknesses of the pavements were used which lead to costly failures and wastage as in some cases, the thickness of pavements was insufficient and in the other cases expensive. As there are no proper design criteria, the construction of roads was more or less uneconomical in almost all cases. Hence judicious method of designing and calculating the crust thickness on the basis of estimation of traffic loads and bearing capacity of sub-grade etc.., will lead to economical construction of roads.

2. OBJECTIVES-

• The surface of a pavement should be stable and non-yielding, to allow the heavy wheel loads of the

road traffic to move with least possible rolling resistance.

• The road should be even along the longitudinal profile to enable the fast vehicles to move safely and comfortably at the design speed.

• The elastic deformation of the pavement should be within the permissible limits, so that the pavement can sustain a large number of repeated load applications during the design life.

• It is always desirable to construct the pavement well above the maximum level of the groundwater to keep the sub-grade relatively dry even during monsoons.

3. METHODOLOGY-

In this project we have considered Group index method and california bearing ratio.some of the properties are Traffic load and Temperature

3.1. GROUP INDEX METHOD:

D.J.Steel suggested the thickness requirements with the Highway Research Board method based on the group index values in 1945. Group index value is an arbitrary index assigned to the soil types in numerical equations based on the percent fines, liquid limit and plasticity index. GI values of soil vary in the range of 0 to 20. The higher the GI value, the weaker is the soil subgrade and for a constant value of traffic volume, the greater would be the thickness requirement of the pavement.

3.2.CALIFORNIA BEARING RATIO METHOD

In 1928, California divisions of highways in the USA developed the CBR method for pavement design. The majority of curves developed later are based on the original curves developed by O.J.Porter. At the beginning of the second world war, the corps engineer of the USA made a survey of the existing method of pavement design and adopted the CBR method for designing military airport pavements. One of the chief advantages of the CBR method is the simplicity of the test procedure.

Most of the road pavements designed in CBR method on the CBR value of sub grade soil determined by conducting CBR test in the laboratory on the sub grade soil disturbed or remoulded depending on whether an existing subgrade is utilized for the pavement without improvement or a new sub grade is to be constructed with proper control over its properties, especially compaction characteristics.

CBR value is defined as the ratio of load required to cause a specified penetration, say 2.5mm or 5mm of a standard plunger into the sample to the load required to produce the same penetration of same plunger into standard stone aggregate sample, expressed as a percentage.

CBR value varies from 0 to 100%. More CBR indicates stronger soil. If density

is less, CBR is less. The CBR is expressed as the percentage of penetration resistance of a given pavement material to that of a standard value of penetration resistance obtained for a crusher stone aggregate available in California.

4. RESULT

Liquid limit of soil = 33.5

Plastic limit of soil = 21.12

California Bearing Of Soil = 14.36%

5. CONCLUSIONS-

- In this project work, an attempt is made to incorporate latest techniques of geometric design, pavement design for a road for an existing colony which is 2 km away from NSRIT college, sontyam.
- The IRC specifications are based on rational thinking, the proposed road is safe in both geometrics as well as pavement design.
- It is also proposed to design a flexible pavement by Group Index method and CBR method.
- Some more methods are available in the design of flexible pavement, which are much more advanced like California resisting value method, Mc load method, Tri-axial method and Burnister method.
- Because of the limitations of time and scope, only the GI method and CBR method are adopted.
- To have a practical concept of estimation analysis, an attempt is made to estimate the quantities of earth work of flexible pavement.

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SOIL STABILIZATION USING INDUSTRIAL WASTE

G.CHANIKYA[1],K. SRAVANI[2],R. BALAJI[3],K.YAMINI [4], CH. SAI VAMSI[5]

Civil engineering & NSRIT college

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ABSTRACT:

Due to rapid increase in urbanization, the lands are required essentially. The role of land in developments is very important. For the development of any country or nations sufficient land should be available, but the land resources are limited. Some of them are suitable for structures or buildings, but there are some land resources which are not suitable for structures for example soft soil. Soft soils have low bearing capacity. Due to this reason, it is not suitable for structures. The bearing capacity of soft soil can be maximize are increased with the help of some industrial wastes and by using some methods. Soils are made stronger and more durable by mixing additive materials. In particular, the use of waste provides environmental and economic advantages for this case. Wastes form in large quantities, however, which create storage problems. The main objectives of the soil stabilization is to increase the bearing capacity of the clay soil, it's resistance to weathering process and soil permeability.IS: 10500-2012..

Key words: *Black cotton, soil stabilization, bagasse ash unconfined compressive strenth test, standard proctor testr.*

1. INTRODUCTION:

Improvement of physical, hydraulic, mechanical and chemical properties of poor soil is called soil stabilization. India produces an enormous amount of different types of waste materials as byproducts from different sectors like industrial, agricultural, etc. These waste materials if not deposited safely it may be hazardous. The amount and type of waste generated increases with increase in population. These wastes remain in the environment for longer duration since it is unused. Waste materials such as industrial waste sand, rice husk, wheat husk offer a cheaper method for stabilizing marginal soils. As an added benefit, utilizing waste materials in soil stabilization applications keeps these materials from being dumped into Landfills, thereby saving already depleting landfill space. In many set of circumstances, road service layers, foundation layers and construction material cannot utilize the soil directly. The rising cost of the land and huge demand for high rise buildings makes the improvement of soil at a site unavoidable. Therefore, it is required to revamp the quality of the soil. The expansive soil used in this research also known as black cotton soil.

OBJECTIVES: The main objectives of conducting this study include:

- The main objective of the study is to enhance the quality of the soil using the rice husk ash and sugarcane straw waste.
- Addition of such material will enhance both physicals well as chemical properties of the soil. This research undertakes the use of agricultural waste in stabilizing black cotton soil, various attempts have been made to improve the strength of soil using different chemical

additives in combination with straw ash. Therefore, by using agriculture waste various properties of soil are improved.

- The physical properties of soil include horizonation, color, texture, structure, consistency and bulk density.

- The chemical properties consist of soil cation exchange and soil reaction that is pH value.

COLLECTION OF MATERIALS:

- Black cotton soil
- Industrial waste sand
- Rice husk ash
- Bagasse ash
- Wheat husk ashdustrial waste is collected

2. METHODOLOGIES:

- Collection of materials.
- Tests conducted on Black cotton.
- Partial replacement of Black cotton soil with Bagasse ash intervals of 2.5%, 5%, 7.5%,10%,to get optimum strength compared to 0%.
- Compare the Index, Engineering properties and strength parameter of Black cotton soil, with and without replacement of Bagasse ash .
- Results and Discussions
- Conclusion

3. EXPERIMENTAL INVESTIGATION

these experiments were conducted in project

- Specific gravity
- Liquid limit
- Plastic limit
- Plastic index
- Proctor compaction test
- California Bearing Ratio test

4. ADVANTAGES:

- It improves the strength of the soil, thus, increasing the soil bearing capacity.
- It is more economical both in terms of cost and energy to increase the bearing capacity of the soil rather than going for deep foundation or raft foundation. It is also used to provide more stability to the soil in slopes or other such places.
- Sometimes soil stabilization is also used to prevent soil erosion or formation of dust, which is very useful especially in dry and arid weather.
- Stabilization is also done for soil water-proof; this prevents water from entering into the soil and hence helps the soil form losing its strength.
- It helps in reducing the soil volume change due to change in temperature of moisture content. Stabilization improves the workability and the durability of the soil.

5. RESULT:

it has been observed that with increasing the percentage of SCBA in black cotton soil, the degree of expansiveness decreases. The value of DFS for black cotton soil is determined 55% and in addition SCBA. The maximum dry density and optimum moisture content is 1.708 gm/cc and 18.2% determined but when 5% SCBA is added in black cotton soil, the maximum dry density and optimum moisture content are increased up to 1.740 gm/cc and 16.4% respectively. It is also observed that when up to 5% SCBA is mixed in black cotton soil, the UCS and CBR value increasing.

Specimen Name	MDD (gm/cc)	OMC (%)
BCS	1.708	18.2
BCS+2.5% SCBA	1.724	17.8
BCS+5% SCBA	1.740	16.4
BCS+7.5% SCBA	1.712	18.4
BCS+10% SCBA	1.686	20.2

LIQUID LIMIT& PLASTIC LIMIT

Specimen Name	Liquid limit WL %	Plastic limit WP %	Plasticity index P.I %	Specimen classification
Soil	54.880	26.64	27.94	CH
Soil + 2.5% SCBA	57.36	27.64	29.72	CH
Soil + 5% SCBA	58.74	28.945	29.80	CH
Soil + 7.5% SCBA	46.45	25.28	21.17	CI
Soil + 10% SCBA	41.48	23.865	17.62	CI
Soil +12.5%SCBA	33.94	19.475	14.47	CL

CALIFORNIA BEARING RATIO TEST

Specimen Name	CBR Value (%)	% Variations
BCS	9.56	-
BCS+2.5%SCBA	9.71	1.53
BCS+5%SCBA	10.15	6.11
BCS+7.5%SCBA	9.34	-2.29
BCS+10%SCBA	8.91	-6.87
BCS+12.5%SCBA	8.61	-9.92

FREE SWELL INDEX

Specimen Name	Free swell index%	Degree of expansiveness	Percentage decrease %
BCS	55.00	VERY HIGH	-
BCS +2.5% SCBA	50.00	HIGH	9.09
BCS + 5% SCBA	47.62	HIGH	13.42
BCS +7.5% SCBA	33.33	MODERATE	39.40
BCS +10% SCBA	28.57	MODERATE	48.05
BCS+12.5%SCBA	19.05	LOW	65.36

6. CONCLUSION:

Black cotton soil is an expansive material, when soil is dry it becomes shrink and soil is wet it becomes swelling nature. So, black cotton soil is not suitable for construction purpose because of its shrink-swell nature. We have to improve their characteristics by mixing miscellaneous material i.e., bagasse ash to the black cotton soil by using ground improvement High expansive black cotton soil can be effectively utilized by as a geotec hnical material by addition of 2.5 to 7.5% of Bagasse ash At this dosage of admixture black cotton soil can be behaves as non plastic and non swelling can reduce the problems of volume change. With increasing percentage decreases

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STRENGTH COMPARISON BETWEEN NORMAL CONCRETE AND SELF HEALING CONCRETE

P. Haragopal[1],V. Pratyusha [2], A.Lakshman Dheeraj[3] , K. Sai Lakshmi[4], M. Gayathri[5] , P. Sai Kumar[6]

P. Haragopal[1] Asst. Prof Civil Department & Nsrit College
V.Pratyusha[2] Student Civil Department & Nsrit College
A. Lakshman Dheeraj[3] Student Civil Department & Nsrit College
K. Sai Lakshmi[4] Student Civil Department & Nsrit College
M.Gayathri[5] Student Civil Department & Nsrit College
P. Sai Kumar[6] Student Civil Department & Nsrit College

ABSTRACT-

The strength can be defined as the ability to resist force. With-regard to concrete for structural purpose it can be defined as the unit force required to cause rupture concrete is very good material to resist the compressive load to a limit but if the load applied on the concrete is more than their limit of resisting load, it causes the strength reduction of concrete by producing the cracks in the concrete and the treatment of the cracks in very expensive.

***Key Words*:** Concrete, Microstructure, Mineral, Polymer, Autonomic Self Healing

1. INTRODUCTION-

Normal cement concrete has clearly emerged as the material of choice for the construction in the world today. This is mainly due to low cost of materials and construction for concrete structure as well as low cost of maintenance. Therefore, much advancement of concrete technology has occurred depending on the speed of construction, the strength of concrete, the durability of concrete and the environmental friendliness of industrial material like, fly ash, blast furnace slag, silica fume etc.

2. OBJECTIVES-

To develop and observe the strength comparison of self healing concrete with normal concrete

- To Develop efficient self-healing techniques for bending cracks in concrete
- To heal cracks by bacterial precipitation.
- To investigate the effect of bacillus species bacteria in gaining strength.
- Enhancing the durability and compressive strength of concrete.

3. METHODOLOGY-

3.1 MATERIALS & METHODS

Self-healing concrete is one of the modern smart concretes, which can heal the cracks formed in it by itself

1. Chemical encapsulation.
2. Bacterial encapsulation.
3. Mineral admixtures.
4. Chemical in glass tubing
5. Self healing with self controlled tight crack width

3.2 MECHANICAL AND PHYSICAL PROPERTIES OF SELF HEALING CONCRETE

Self-Healing Phenomenon: Self-healing concrete is one of the modern and smart concretes, in which the cracks can be healed by themselves. French Academy of Science has been the first to notice autogenous shealing of cracks in fractured concrete in water retaining structures in 1836.Calcium carbonate crystallization within the crack fracture surface is the major mechanism for self-healing of matured concrete.

particular, a calcite formation in the region of water-effecting cracks takes place in the material arrangement CaCO3-CO2-H2O corresponding to the following reactions:

(Ca^2+) + (Co^2-)3 ------ CaCo3 (pH > 8)

(Ca^2+) +HCo3^------- CaCo3+H^+ (7.5<pH water<8)

3.3 Mix Design:-

Design of Concrete mixes is made according to ACI 211-91 Concrete with compressive strength of 35 MPa , slump of 75 to 100 mm, and unit mass equal to 2280 kg/m3.

The mixing proportion used is 1:2 ½: 5:0.45 along with 30 ml liquid form of Bacillus Subtilis with the cell concentration of 105 cells/ml

Mix proportion by weight of concrete materials according to ACI 211-91

Material	Cement	Gravel	Sand	Water
Mix proportion by weight (kg/m³)	456	1040	555	205
Mix proportion	1	2.281	1.217	0.45

Cement:

Ordinary Portland Cement(OPC) of 53 grade having specific gravity of 3.16 is used.

Fine aggregate:

River sand belongs to Zone II having specific gravity of 2.668 is used.

Coarse aggregate:

Crushed angular aggregate of size 20mm having specific gravity of 2.686 is used.

Water:

Locally available potable water is used.

Bacteria:

Bacillus Subtilis bacteria of gene Bacillus, a laboratory cultured bacteria is used.

Mix Design:

We designed a mix forM25grade concrete for the following data:

a. Grade designation : M25

b. Type of cement : OPC 53 grade

c. Maximum nominal size of aggregate : 20mm

d. Minimum cement content : 320kg/m3

e. Maximum water-cement ratio : 0.50

f. Workability :100mm(Slump)

g. Exposure condition : Moderate

h. Method of placing : Manual

i. Degree of supervision : Good

Comparison of Compressive Strength results

The change of compression strength for the 7 days ,14 days & 28 days

Comparison of Compressive Strength for 7 days

7-DAYS RESULT	STRENGTH (N/MM^2)	INCREASE IN STRENGTH (%)
NORMAL CONCRETE	16.25	-
BS of 10ml	17.18	5.72
BS of 20ml	18.41	7.15
BS of 30ml	24.55	9.23

Comparison of Compressive Strength for 14 days

14-DAYS RESULT	STRENGTH (N/MM^2)	INCREASE IN STRENGTH (%)
NORMAL CONCRETE	17.61	-
BS of 10ml	19.65	11.58
BS of 20ml	25.16	20.15
BS of 30ml	36.37	24.37

Comparison of Compressive Strength for 28 days

28-DAYS RESULT	STRENGTH (N/MM^2)	INCREASE IN STRENGTH (%)
NORMAL CONCRETE	20.25	-
BS of 10ml	26.10	28.88
BS of 20ml	34.03	30.34
BS of 30ml	38.36	33.41

4. RESULTS-

Compressive Strength = $(9.81\times380\times1000)/(150/150)=16.5\ N/mm^2$

Compressive Strength = (9.81×400×1000)/(150/150)= 17.59 N/mm^2

Compressive Strength = (9.81×410×1000)/(150/150)= 18.25 N/mm^2

5. CONCLUSIONS-

- Water mixed with microsilica particles supports an external crack closure as well as induces flexural strength regain.
- The silica particles possible act as nucleation sites for the formation of self-healing products.
- From the compressive test results, it can be observed that on addition of certain minimum quantity of bacillus subtilis, the increase in strength is maximum for BS-30% and at-least BS-10%.
- On addition of bacillus subtilis there is a substantial increase in the earlier age strength of concrete compared to 28 days increase in strength.
- The overall strength of concrete is the compression strength test results shows that quality

of self healing concrete is prevented on addition of bacillus subtilis.

6. REFERENCE-

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