

InstruTech

TECHNICALMAGAZINE

A.Y.2023-24



ICONS

Instrumentation & Control Student's Chapter

Department of Instrumentation and Control Engineering
Maratha Vidya Prasarak Samaj's
Karmaveer Adv. Baburao Ganpatrao Thakare College of
Engineering, Nashik-422013 (India).

Institute Vision

To be internationally accredited, Multidisciplinary, and Multi-collaborative institute working on technology enabled platform fostering innovations and patents through state-of-art academic system designed by highly qualified faculty for the development of common masses at large.

Institute Mission

To educate and train common masses through undergraduate, post graduate, research programs by inculcating the values for discipline, quality, transparency and foster career and professional development for employment thereby contributing to the development of society

Department Vision

To be an accredited department of preferred choice among common masses in the multidisciplinary field of automation and control engineering.

Department Mission

- To prepare competent professionals to meet current and future demands of industry, academia and society of multidisciplinary field of automation.
- To strengthen collaboration with reputed industries and institute of global insight.
- To inculcate spirit of research and entrepreneurship amongst the students.

Program Educational Objectives

Following are the competencies will developed in the students after 3-5 years of his/her graduation.

1. To build core competency in the multidisciplinary field of automation to cater the industry and research needs.
2. Develop multi-disciplinary skills, team spirit and leadership qualities with ethics, to excel in professional career and higher studies in Instrumentation and Control Engineering.
3. To learn and apply contemporary technologies for addressing impending challenges for the benefit of organizations and society.

About This

This department magazine covers the abstracts of the projects participated in the project competition under InstaTech-2k23 Techfest. This competition provides an excellent opportunity for students to showcase their talent, research orientation, and potential. The goal of this competition is to prepare the future generation of engineers to not only be problem solvers but also innovative leaders and responsible citizens. The students deserve recognition for the hard work they put into their projects.

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1. FIRE ALARM SYSTEM USING NODE MCU AND GSM MODULE

Name of Student: Ujjwal Jadhav,
Rohit Dabhade, and
Rutik Diwan

Year: B.E. _2023-2024

Abstract:

Fire alarm systems are essential in alerting people before fire engulfs their homes. Therefore, we are proposing a fire alarm system based on Node MCU (ESP8266) and GSM (Global System for Mobile Communication) module. In this project, we are using components like, Node MCU (ESP8266), GSM Module, smoke sensor, fire sensor and temperature sensor. We are using Node MCU for Wi-Fi connection. When the sensor detects fire or smoke the GSM module will send a message to the registered phone number. Example: “smoke detected” or “fire detected” and it will also display a message on LCD display.

2. SAFE BRAKING SYSTEM WITH BRAKE FAILURE INDICATOR

Name of Student: Mohini Kulthe,
Lalit Chavan, and
Vedant Sonawane

Year: B.E. _2023-2024

Abstract:

The braking system is one of the most essential components of an automobile. The aim of this work is to create a safe braking system with brake failure indicator. Brake failure occurs mostly because of cut in liner and worn out of brake shoe. The signal from both the sensors is delivered to a microcontroller. The sensor senses signal to the microcontroller when the brake shoe is worn out and also if the brake liner is cut. The microcontroller analyses the signal and operates the corresponding indicator. If there is no defect anywhere, green indicator glows and the red indicator glows if there is a problem with brake shoe or brake liner. If the brake failure occurs while the vehicle is running, automatically an alternate brake will be operated by the microcontroller. This system plays a major role in the safety by preventing unnecessary accidents. Our project guides in indicating the status of the brake, facilitating the user to identify and limit the chances of malfunction.

3. SCADA BASED AUTOMATIC FUEL TANK AT LOCAL PETROL PUMP

Name of Student: Harshali Vijay Ahirrao, and
Darshana Sahebrao Bhoi

Year: B.E. _2023-2024

Abstract:

Now-a-days, the transportation of fuel from fuel reservoirs to the local petrol pump are held by or carried by fuel trains and tankers. But in some cases, tankers catch fire. Therefore, this SCADA based automatic fuel tank system at local petrol pumps is a technologically advanced solution that aims to streamline the processes of fuelling filling in underground tank. This system is designed to monitor the fuel levels in the tanks and automatically replenish them when required, eliminating the need for manual intervention. This system consisting of the level transmitter, solenoid valve and pump interconnected through a network and monitored through SCADA. The SCADA system provides the real-time data on fuel levels, its' consumption, and other vital parameters, allowing the petrol pump operators to make informed decisions and optimize their operations. This system with its advanced feature is ensure and will improve efficiency along with minimizing the risk of loss of the fuel or theft/pilferage.

4. IOT BASED COLOUR SORTING MACHINE USING ARDUINO

Name of Student: Pomnar Poonam,
Datir Khushi, and
Nikam Gitanjali

Year: B.E. _2023-2024

Abstract:

In this digital world, colour processing in different industries gives us more leverage to solve the consistency problem of continuous manual sorting. This document will be a new approach to continuously detect and classify object and keep them in a specific place. Colour processing attracts a lot of attention since the help of modern technology leads to the possibility of expanding the scope of its application in various areas. The Arduino Nano microcontroller, TCS3200 colour sensor, servo motor, and other electronic components are used to study, develop, and build a colour sorter.

5. WATER SUPPRESSION FOR SHRINK RAP TUNNEL

Name of Student: Vaishnavi S. Khandre , and
Komal Dinde

Year: B.E. _2023-2024

Abstract:

In this project for suppression for shrink wrap tunnel water mist fire suppression has increased within the fire protection industry due to its ability to control the spread and development of fire without using environmentally damaging agents. It has been used for many years in various application such as machinery spaces, combustion turbine enclosures and onboard passenger's sea vessels. It is able to identify the fire and sense by the flame detector sensor give an input to relay and water supply will on be and water will drop. More affordable equipment with similar performance would be breakthrough in the field of tunnel safety. These improvements enhance tunnel safety and make tunnel conditions during a fire less threatening to human health. The basic concepts of fire suppression systems are depicted. There are mainly two water-based fire suppression systems used in tunnels, that is, water spray systems and water mist systems. The main differences are the water density, pressure, and droplet size. The extinguishment mechanisms are explored and the critical conditions at extinction are discussed. Further, suppression of realistic fires is discussed considering both the water flow rate and the total water flow rate used for fire suppression. A summary of fire suppression tests carried out in tunnels is presented followed by a short discussion of tunnel fire detection.

6. IOT TEMPERATURE BASED AUTOMATIC FAN SPEED CONTROL AND MONITORING SYSTEM

Name of Student: Sakshi Honrao,
Sanika Naik, and
Aditi Jagtap

Year: B.E. _2023-2024

Abstract:

This project is a standalone automatic fan speed controller that controls the speed of an electric fan according to our requirement. Use of embedded technology makes this closed loop feedback control system efficient and reliable. Microcontroller (ATMega8 / 168 / 328) allows dynamic and faster control. Liquid Crystal Display (LCD) makes the system user-friendly. The sensed temperature and fan speed level values are simultaneously displayed on the LCD panel. It is very compact using few components and can be implemented for several applications including Air-conditioners, water-heaters, snow-melters, ovens, heat-exchangers, mixers, thermal baths and veterinary operating tables. ARDUINO micro controller is the heart of the circuit as it controls all the functions. The temperature sensor LM35 sense the temperature and convert it into an electrical signal, which is applied to the microcontroller. The sensed and set values of the temperature are displayed on the 16x2 – line LCD. The microcontroller drives Transistor to control the fan speed. This project uses regulated 12V, 2A power supply. This project is useful in process industries for maintenance and controlling Boilers temperature.

7. IMPLEMENTATION OF OUTPUT TIME MEASUREMENT CIRCUIT

Name of Student: Prashant Shinde,
Harshad Udmale, and
Prajwal Shinde

Year: B.E. _2023-2024

Abstract:

In this mini project explores verification of complex theoretical problems with practical electronic circuit. Hardware implementation is done with LM311, 7486 and 7404 IC. Where exist different between theoretical answer published in literature and practical value. Same problem is simulated using matlab software. This mini project explore and developed analytical skills using electronics components, signal generator and oscilloscope.

8. LOW-COST SOLUTION FOR AUTOMATIC WATER COOLER

Name of Student: Ahirrao Jayesh Vikas, and
 Tidke Vaishnavi

Year: B.E. _2023-2024

Abstract:

Automatic water cooler provides a good quality water. In day to day life intelligent systems are used in a wide range and these are embedded in design. Automatic Water Cooler are designed to fetch water from the bottle cans and dispense water. A water cooler is a machine that dispenses and often also cools or heat up water with a refrigeration unit. The concept behind making this project is to make automatic water cooler very easy and simple to handle. We observed that, many times the water is spilling out on the floor. So, this is a small step towards the less wastage of this renewable resource. This technique changes the lifestyle of the public since they don't need to operate tap manually through their hands. With many more modifications this cooler has a very good future scope which also ensures minimum wastage of water.

9. DISTANCE MEASURING DEVICE

Name of Student: Kajal Pomnar,
Tejal Jagdale, and
Sonali Kasav

Year: B.E. _2023-2024

Abstract:

Ultrasonic Distance Measurement is a useful tool in various applications lately. It can be used in various applications such as positioning, locating, dimensioning, selecting, level measurement, controlling and profiling. So, keeping these applications in mind, the Ultrasonic Sensor is a great tool to measure distances without making any physical contact for small distances. They use the concept of ECHO to measure the distance. In this project, we'll learn how to measure the distance by interfacing HC-SR04 sensor module with Arduino and display the distance on a 16×2 LCD. These distance measurement sensors connect with all common types of automation and telemetry equipment. Machinery and processes in a wide range of industries use distance measurement sensors where size or position feedback is required. Distance measurement sensors are used to control or indicate the position of objects and materials. Distance measurement sensors can determine the dimensions of objects such as height, width and diameter, using one or more sensors.

10. WIND TURBINE BATTERY CHARGE

Name of Student: Savi Khairnar,
Pooja Jadhav, and
Avantika Benke

Year: B.E. _2023-2024

Abstract:

In recent days' power generation using renewable energy sources gained more attraction. The most commonly available and used energy resources are solar energy and wind energy. Now a day, there is shortage of fuel in our country. So, we have to import it from other countries and it will effect on our economic conditions, because of this the use of electrical appliances has been increased day by day. In this project wind energy has been used to charge battery this technology can help to meet power requirement when electricity is not available. This project is pollution free and hence environmental friendly and also beneficial to society. So, by using the renewable energy i.e., wind energy source we are able to generate electricity and able to charge battery.

11. REMOTE MONITORING OF PHYSICAL PARAMETERS

Name of Student: Atharva Aher,
Onkar Dhawle, and
Prapti Gundecha

Year: B.E. _2023-2024

Abstract:

This work conceptualizes the idea of remotely connecting and monitoring real-world objects (things) through the Internet. When it comes to monitoring industrial parameters like temperature, humidity, CO₂, etc., this concept of remote connection helps a lot. Here in the project, we have utilized a microcontroller and different sensors to demonstrate parameters. Arduino Uno is used as a microcontroller to complete project objectives. For sensing industrial parameters such as temperature we used LM35, for humidity DHT11, and CO₂ we used MQ135. All the sensors sense respective parameters and convert them into electrical signals. This signal is then given to the microcontroller. We are using a Wi-Fi module that consists integrated TCP/IP protocol stack for broadcasting sense data on web pages. This project will help us to monitor industrial parameters remotely, moreover, with the use of our created algorithm, we can analyse the data example graphical representation, day average.

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Website: www.kbtcoe.org

Email : hod.instru@kbtcoe.org