VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590 018

AI AURDINO ROBOT

Submitted as Subject Assignment Work for

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

BY

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S. Sri Harshith	**4AL21CS165**
Shivarama Reddy G V	**4AL21CS142**
Santhosh H	**4AL21CS131**
Vinith S B	**4AL21CS182**
Srinivas L V	**4AL21CS156**

Under The Guidance Of

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2022 – 2023

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AI ARDUINO ROBOT
INTEGRATED ROBOT WITH ARTIFICIAL INTELLIGENCE

1.1 INTRODUCTION:

This project will do our talking robot with artificial intelligence-based Arduino.
Then in our previous project, we made our robot we checked into the phone's voice command. In this project we develop our robot, voice commands will send the phone the same way again, giving us a voice response. This way, your robot will speak to you. You can also use educational robots for kids. For example, the integrated robot that detects whether color can color an educational robot for kids says it aloud.

1.2 PROCEDURE:

The following are the steps involved in building the Arduino Android robot project:

- Necessary components.
- Assembling the robot's hardware.
- Code to control the robot.
- Testing the robot.

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ANDROID AURDINO ROBOT

Submitted as Subject Assignment Work for

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

BY

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Sumanth Herla	**4AL21CS163**
Ullal Mohammed Adhif	**4AL21CS169**
Varshith V Hegde	**4AL21CS170**
Vikhyath Rai MS	**4AL21CS177**

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1.ANDROID ARDUINO ROBOT

Figure 1 Android Arduino Robot

1.1 INTRODUCTION:

The objective of this project is to build an Arduino Android robot that can be controlled by an Android phone. The robot will use a Bluetooth module to connect to the phone, and then you can use the phone's touchscreen to control the robot's movements. Android controlled Arduino robot car make use of an Android mobile phone for robotic control with the help of HC-05 Bluetooth technology. This is a simple robotics projects using Arduino microcontroller. This project is a Bluetooth controlled robot. The robot can move forward, backward, left, and right and can also be stopped.

1.3 PROCEDURE:

The following are the steps involved in building the Arduino Android robot project:

- Necessary components.
- Assembling the robot's hardware.
- Code to control the robot.
- Testing the robot.

1.3 COMPONENTS REQUIRED:

- Arduino UNO

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ANDROID CONTROLLED ROBOT USING BLUETOOTH

Submitted as Micro-controller and Embedded systems assignment work

BY

Manvitha S Rai	**4AL21CS069**
Pallavi U	**4AL21CS090**
Poorvi K Shettar	**4AL21CS094**
Prathiksha S Hegde	**4AL21CS100**

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Chapter 01

ANDROID CONTROLLED ROBOT USING BLUETOOTH

Abstract:

This report outlines the implementation of an Android-controlled robot using Bluetooth communication. The project involves designing a robot that can be controlled remotely through a mobile application running on an Android device.

Bluetooth technology is utilized to establish a wireless connection between the robot and the Android device, allowing users to send commands and control the robot's movements. The report covers the hardware components, software design, and implementation details of the project.

1.1 Introduction:

The advancement in wireless communication technologies has led to the development of remote-controlled robots for various applications, including education, entertainment, surveillance, and more. Bluetooth, a short-range wireless technology, offers a convenient way to control robots using smartphones or tablets. In this project, we explore the design and implementation of an Android-controlled robot using Bluetooth communication.

Android controlled robot project make use of an Android mobile phone for robotic control with the help of Bluetooth technology. This is a simple robotics projects using microcontroller.

This project is a Bluetooth controlled robot. For this the android mobile user has to install an application on her/his mobile. Then user needs to turn on the Bluetooth in the mobile. The wireless communication techniques used to control the robot is Bluetooth technology. User can use various commands like move forward, reverse, stop move left, and move right. These commands are sent from the Android mobile to the Bluetooth receiver.

Android based robot has a Bluetooth receiver unit which receives the commands and give it to the microcontroller circuit to control the motors. The microcontroller then transmits the signal to the motor driver ICs to operate the motors.

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An ASSIGNMENT REPORT ON

Arduino-Based Water Dispenser

Submitted as subject assignment work,

for the subject

Microcontroller And Embedded System (21CS43)

By

Mohammed Abrar	**4AL21CS071**
Naorem Shitaljeet Singh	**4AL21CS082**
Preethesh D Souza	**4AL21CS102**
Sagar M Hadapad	**4AL21CS122**
Sanjay R	**4AL21CS127**

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This is to certify that **Mohammed Abrar** bearing USN **4AL21CS071** has successfully demonstrated the working of **Arduino-Based Water Dispenser** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 even Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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ARDUINO-BASED WATER DISPENSER REPORT

1. Introduction:

The Arduino-based water dispenser is a project that aims to automate the process of dispensing water using an Arduino microcontroller. This report outlines the design, components used, working principle, and potential applications of the water dispenser.

An Arduino-based water dispenser is a project that utilizes an Arduino microcontroller board to create an automated system for dispensing water. This project involves connecting various components, such as water pumps, sensors, and valves, to the Arduino board to control the flow of water. The Arduino board processes user input or sensor data and triggers the water pump to dispense a desired amount of water through a nozzle or valve.

The primary goal of an Arduino-based water dispenser is to provide a convenient and automated way to dispense water. This can be particularly useful in scenarios where manual dispensing might be inconvenient or where accurate measurement of water volume is desired.

2.Design and Components:

The water dispenser consists of the following main components:

2.1 Arduino Microcontroller:

An Arduino board serves as the brain of the system. It receives inputs, processes them, and controls the output components accordingly. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button.

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ELECTRONIC VOTING MACHINE USING AURDINO

Submitted as Microcontroller and Embedded System assignment work

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AKSHAY V MENDON	**4AL21CS016**
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ELECTRONIC VOTING MACHINE USING ARDUINO

INTRODUCTION

This project is all about Simple & Smart Electronic Voting Machine Using Arduino. The basic idea of this project is to create an electronic voting machine that will help to eradicate defrauding of the manual voting systems and prior versions of electronic voting.

The system is provided with n number of the switch where n is the number of a political party. Here the voter will be allowed to proceed for choosing their preferred candidate from the panel of buttons. The final vote is then displayed onto an LCD for the satisfaction of voters. In the end, the result can be automatically calculated by pressing the result button

COMPONENTS REQUIRED :

Sl No	Components Name	Quantity
1	Arduino UNO Board	1
2	16x2 LCD Display	1
3	Potentiometer	1
4	Push Button Switch	4
5	Connecting Wires	20
6	Bread Board	1

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VIRTUAL LAB REPORT

Submitted as Microcontroller and Embedded System assignment work

BY

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Revana Sidda P	4AL21CS116
Rithu S.S	4AL21CS117
Rohit S.M	4AL21CS118
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This is to certify that, assignment work for the subject "~~Design and Analysis of Algorithms~~" has been successfully completed and report submitted by Pragati S.M during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and score 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "Design and Analysis of Algorithms "has been successfully completed and report submitted by Rohit S.M during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and score 09 Marks out of 10 and deposited in the departmental library.

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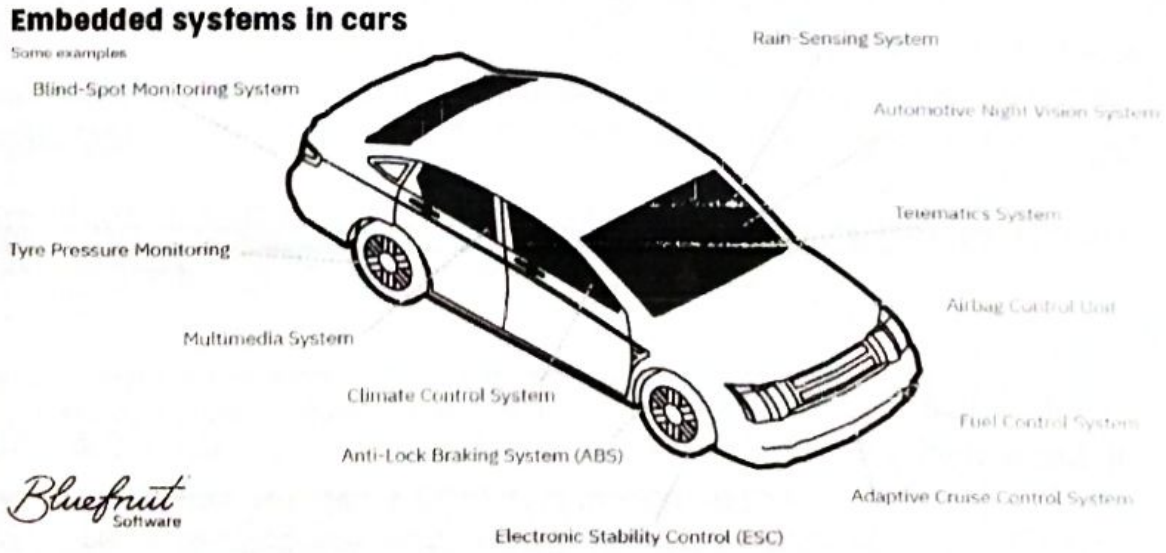
AUTOMATION OF CARS USING EMBEDDED SYSTEM TECHNOLOGY.

Introduction to Automation of Cars Using Embedded System Technology:

In recent years, the automotive industry has undergone a remarkable transformation, with the advent of automation paving the way for a new era in transportation. At the heart of this revolution lies the fusion of cutting-edge embedded system technology with the world of automobiles, giving birth to what we now know as autonomous or self-driving cars. These vehicles represent a remarkable intersection of technology, safety, convenience, and sustainability, and their emergence is poised to reshape the way we live, work, and move.

Embedded systems, the unsung heroes of modern engineering, are the driving force behind the incredible capabilities of autonomous cars. These systems are intricately woven into every facet of the vehicle, from sensing the environment to processing vast amounts of data in real-time, and ultimately, making split-second decisions to ensure safe and efficient travel. Embedded systems are what enable these vehicles to perceive their surroundings, navigate complex roadways, and interact intelligently with other vehicles and infrastructure.



VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI – 590 018

An Assignment on

DIGITAL ALARM CLOCK USING ARDUINO

Submitted as Subject assignment work for

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

BY

SHETTY YASH	4AL21CS139
SHREYAS B L	4AL21CS146
SHINIVASRADDI	4AL21CS148
SUDARSHAN T BHAT	4AL21CS160
VINAYAKUMARA S S	4AL21CS181
VISHNUNAIK N T	4AL21CS184

Under the Guidance of

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Assistant Professor

And

Mrs. Babitha Poojary
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DIGITAL ALARM CLOCK USING ARDUINO

Abstract-

In this project, we designed an Arduino based Real Time Clock with alarm. A Real Time Clock or RTC is a battery powered clock that measures time even when there is no external power or the microcontroller is reprogrammed. An RTC displays a clock and calendar with all timekeeping functions. The battery, which is connected to the RTC is a separate one and is not related or connected to the main power supply.

When the power is restored, RTC displays the real time irrespective of the duration for which the power is off. Such Real Time Clocks are commonly found in computers and are often referred to as just CMOS . Most microcontrollers and microprocessors have built in timers for keeping time. But they work only when the microcontroller is connected to the power supply. When the power is turned on, the internal timers reset to 0. Hence, a separate RTC chip is included in applications like data loggers for example, which doesn't reset to 0 when the power is turned off or reset.Real Time Clocks are often useful in data logging applications, time stamps, alarms, timers, clock builds etc. In this project, a Real Time Clock, which displays accurate time and date along with an alarm feature is designed.In this project an attempt is made to develop and explain the use of Digital alarm clock using Arduino.

1.INTRODUCTION

Embedded system is otherwise called an implanted PC framework, much the same as its name suggests, it is an uncommon type of an overall PC. To under- stand what precisely an inserted framework is, we should give it away from a PC. "A PC is an electronic gadget, working heavily influenced by directions put away in its own memory. These guidelines instruct the machine. The PC is equipped for tolerating information (input), preparing information numerically and intelligently, delivering yield from the

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI – 590 018

Assignment report on

Digital Soil Moisture Sensor Meter

Submitted as subject assignment work

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

BY

SHARVARI RAO	**4AL21CS135**
SHETTY SAKSHI SUKHANANDA	**4AL21CS138**
SHREYA	**4AL21CS144**
TEJASWINI VENKATESH GUDIGAR	**4AL21CS167**
VINAY KUMAR S N	**4AL21CS178**
NAVEESH KUMAR	**4AL21CS190**

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DIGITAL SOIL MOISTURE SENSOR

Soil moisture sensor, can detect amount of moisture in soil (roots of a plant).It is a low –Tech sensor. This sensor is compatible with Arduino UNO, Arduino mega 2560, Arduino ADK etc. Soil moisture sensors aid good irrigation management. Good irrigation management gives better crops, uses fewer inputs, and increases profitability. Soil moisture sensors help irrigators to understand what is happening in the root zone of a crop.

With an increase in globalization and urbanization, a need for more productive and efficient methods for growing crops for an increasing population and a decreasing amount of farmland is very prominent. There has also been an increase in pollution in the global hemisphere that has and will continue affect the production of crops. Thus, a need arises to create a soil moisture system with statistical analysis of the data to aid in the monitoring of crop growth and production. Furthermore, pollution will be decreased with the production of a self-sufficient device which does not require external electrical power.

OBJECTIVE

The objective is to create moisture sensor that is convenient for farmers. The system will measure the moisture of the soil periodically throughout the user-selected time period. It will report the measured data to the user through a statistical interface which will allow for data analysis.

Soil Moisture Sensor System

Soil moisture sensor systems can be implemented in a variety of ways. A simple resistive soil moisture sensor can be used to measure the resistance of the soil, which is proportional to the amount of water content in the soil.

However, the resistance of soil is also dependent on temperature, thus an accompanying temperature sensor would increase the accuracy of the sensor.

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Activity Report on

DIGITAL THERMOMETER

Submitted as subject assignment work

MICROCONTROLLER AND EMBEDDED SYSTEMS (21CS43)

Submitted as subject assignment work

BY

VEDA ISHWAR CHAVAN	**4AL21CS171**
SANTHOSH V D	**4AL22CS412**
SATHISH S	**4AL22CS413**
SHAMBU K BADANIKAI	**4AL22CS414**
SRINIVASA	**4AL22CS415**
VARSHITHA A R	**4AL22CS416**
MOHAMMED KHIZER M	**4AL22CS417**

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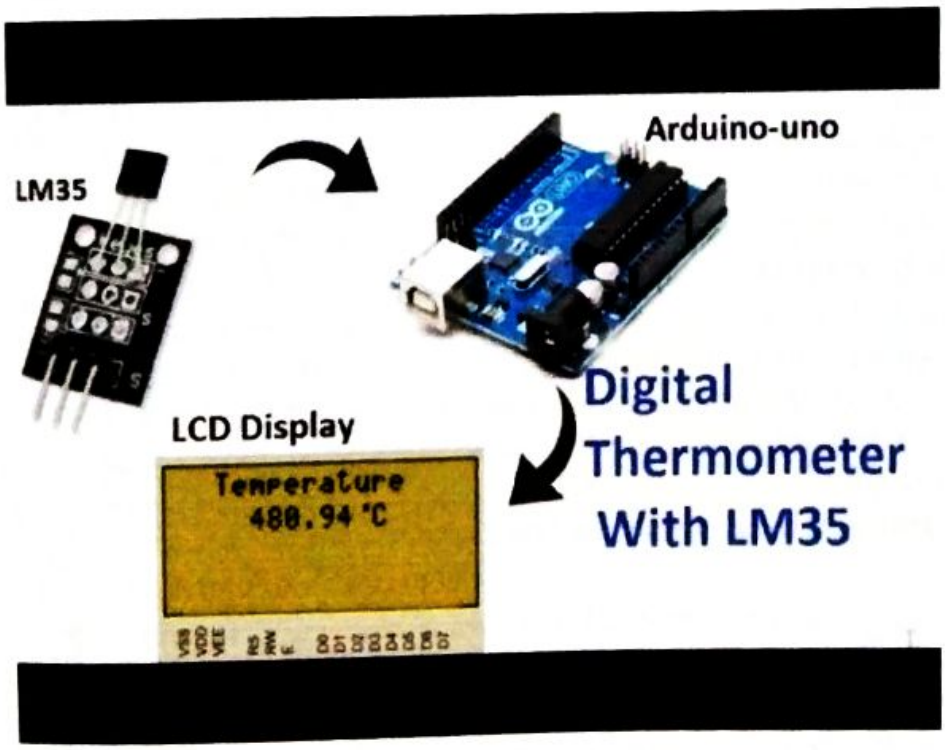
Introduction to Digital Thermometers

In today's fast-paced and technologically advanced world, the measurement of temperature has been greatly enhanced by the introduction of digital thermometers. These electronic devices have transformed temperature monitoring by offering accuracy, speed, and convenience that surpass traditional mercury-based thermometers. With their widespread applications in various fields, digital thermometers have become an indispensable tool for professionals and individuals alike.

Gone are the days of relying on mercury columns to ascertain temperature; digital thermometers have taken center stage due to their reliability and ease of use. Leveraging principles of modern electronics, these devices convert temperature readings into digital signals that can be swiftly processed and displayed on a screen. This not only ensures precision in measurement but also provides an instantaneous and easily readable result, eliminating the need for interpretation or guesswork.

The adoption of digital thermometers is not confined to a single domain. From medical environments to industrial processes, culinary settings to meteorological stations, digital thermometers have found their place as indispensable tools for obtaining accurate temperature readings. Their versatility, coupled with advancements in sensor technology and design, continues to drive innovation in temperature measurement.



VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

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An Assignment Report on

DOOR UNLOCK SYSTEM USING FACE RECOGNITION

Submitted as subject assignment work

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

BY

MOOLYA CHAITRA SATISH	**4AL21CS077**
NEHA R SHETTY	**4AL21CS085**
NEHA R BARKI	**4AL21CS086**
P K VARNINI	**4AL21CS089**
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DOOR UNLOCK SYSTEM USING FACE RECOGNITION

1. Introduction

Nowadays, as the technology is increasing, facilities for human beings are increasing. In day to day activities, life of people has become very easier with the incorporation of many technologies. On the other hand, it also creates security issues . The traditional door locks have a problem that almost anyone can break and enter into your house. Hence it is a great challenge to overcome these problems. In general, in order to secure home, people make use of CCTV. Images will store in the database, so that the action can be taken when any suspicious incident happens. This type of approach is a passive . But there is a need for an active approach. This type of approach is nothing but where actions can be taken immediately as soon as a security threat occurs . Hence a smart IOT based face recognition system is the idea to develop, which recognizes the face of the person near by the door and compares with the uploaded faces stored in the database . If person is detected then the door would open and welcomes them. If an unknown person enters, the owner would be alerted by message and mail with an intruder image. To develop this system, we have used Raspberry Pi, Pi camera which will be installed near the door for recognition of face of an intruder, DC motor to open the door through relay, LED's to indicate whether the door is opened or not, GSM module is used in order to send messages to the registered mobile number.

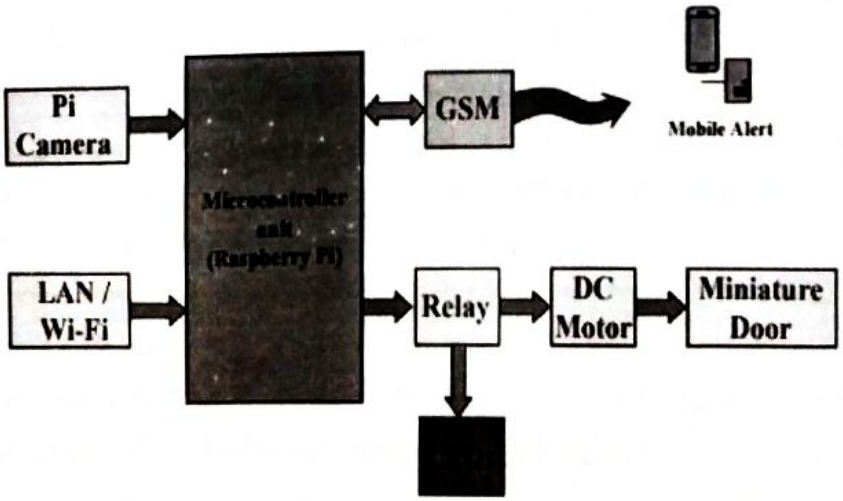

Figure 1

2. Proposed system architecture

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

An Assignment Report On

ELECTRONIC VOTING MACHINE SYSTEM USING ARDUINO

Submitted as subject assignment work,

for the subject

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

By

Poojary Prathiksha D	**4AL21CS093**
Preksha P Poojary	**4AL21CS103**
Sahana	**4AL21CS123**
Sannidhi	**4AL21CS128**
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MOODBIDRI-574225, KARNATAKA

2022 – 2023

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This is to certify that **Poojary Prathiksha D(4AL21CS093),** has successfully demonstrated the **Electronic Voting Machine Using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Preksha P Poojary (4AL21CS103)**, has successfully demonstrated the **Electronic Voting Machine Using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a reportduring the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 07 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Sahana (4AL21CS123),** has successfully demonstrated the **Electronic Voting Machine Using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Sannidhi (4AL21CS128)**, has successfully demonstrated the **Electronic Voting Machine Using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Sannidhi Shetty(4AL21CS129)**, has successfully demonstrated the **Electronic Voting Machine Using Arduino** as the assignment work for the subject**"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored

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MICROCONTROLLER AND EMBEDDED SYSTEM REPORT

ELECTRONIC VOTING MACHINE

Introduction:

The basic concept involves integrating various hardware components such as an Arduino board, a display (such as an LCD screen), input buttons, and potentially other elements like RFID or biometric authentication devices. The Arduino board acts as the central control unit, managing the interactions between the voter and the system, collecting and processing votes, and ensuring the security of the entire process.

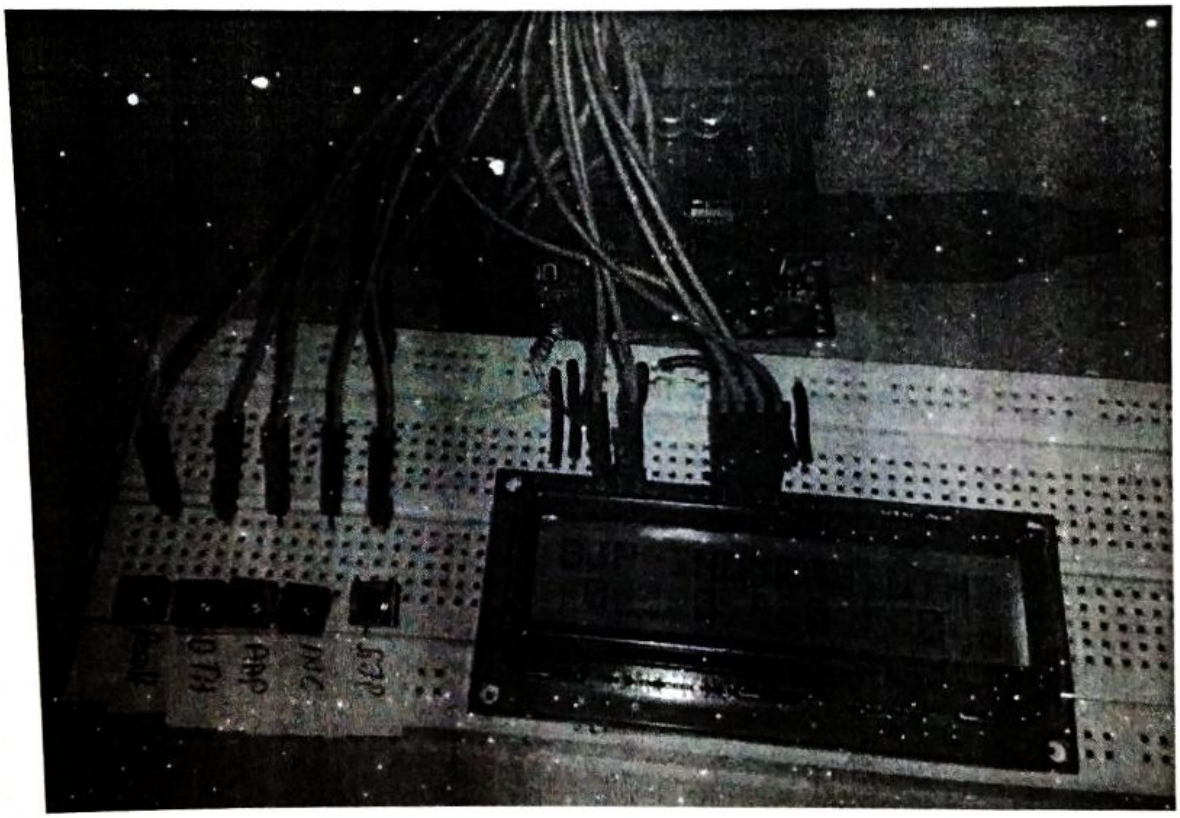

Figure 1: Arduino based Electronic voting machine

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

An ASSIGNMENT REPORT ON

FINGERPRINT DOOR LOCK SYSTEM USING ARDUINO

Submitted as subject assignment work,

for the subject

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

By

Sansitha Rajesh	**4AL21CS130**
Shetty Balija Deepthi	**4AL21CS137**
Soumya	**4AL21CS153**
Spandana Shetty	**4AL21CS154**
Vehana Naik	**4AL21CS173**
Mandira Rajiv	**4AL21CS189**

Under the Guidance of

Mrs. Babitha Poojary

Assistant Professor

Mr Abhijith Kotian

Assistant Professor

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This is to certify that **Sansitha Rajesh (4AL21CS130)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored

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This is to certify that **Shetty Balija Deepthi(4AL21CS137)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject "**Microcontroller and Embedded System (21CS43)**" and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Soumya (4AL21CS153)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Spandana Shetty (4AL21CS154)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored

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This is to certify that **Vehana Naik(4AL21CS173)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Mandira Rajiv(4AL21CS189)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject**"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored

8 Marks out of 10 and deposited in the departmental library.

FINGERPRINT DOOR LOCK

1.1 AIM

The goal of this project is to research and analyse a suitable collection of components for developing a smart door lock using Arduino that provides excellent security and quick access.
The following are the specific project goals:

- Familiarity with a smart door locking system based on a microcontroller.
- Using Arduino to create a simple and smart door locking system.

1.2 INTRODUCTION

The Fingerprint Door Lock System project we implemented a Fingerprint-Based Security System Using Arduino & Fingerprint Sensor. As thefts are increasing day by day security is becoming a major concern nowadays. So, a digital fingerprint lock can secure our home or locker easily. It will open your door only when the right fingerprint is entered. Only authorized people are allowed access to the restricted sections due to a fingerprint-based door lock mechanism. The Arduino is responsible for the entire project's operation.
A particular procedure or set of procedures demonstrating the issue is massive revision of teaching methodology. In a report or article, the methodology section allows the reader to critically evaluate a study's overall validity and reliability. So, this methodology chapter explains what we did and how we did it.

1.3 Circuit and Working Principle

The circuit shown in Fig. 1 operates using a 12V power supply. An Arduino microcontroller (MCU) requires only 5V but the solenoid electric lock requires 12V. As Arduino Uno has an inbuilt 5V voltage regulator, a common 12V supply can be used for the whole system.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI

An ASSIGNMENT REPORT ON

FINGERPRINT DOOR LOCK SYSTEM USING ARDUINO

Submitted as subject assignment work,

for the subject

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

By

Meghana V	**4AL21CS070**
Mydam Niharika	**4AL21CS079**
Najmul Huda	**4AL21CS080**
Radhika	**4AL21CS108**
Radhika B N	**4AL21CS109**

Under the Guidance of

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2022 – 2023

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This is to certify that **Meghana V (4AL21CS070),** has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Mydam Niharika(4AL21CS079),** has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Najmul Huda (4AL21CS080)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Radhika (4AL21CS108)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Radhika B N(4AL21CS109)**, has successfully demonstrated the **Fingerprint door lock system using Arduino** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

FINGERPRINT DOOR LOCK

1.1 AIM

The Fingerprint Door Lock System project aimed to design, develop, and implement a secure and convenient door access control solution using biometric fingerprint recognition technology. The system provides enhanced security compared to traditional key-based locks and offers ease of use for authorized personnel.

1.2 INTRODUCTION

The Fingerprint Door Lock System project seeks to modernize conventional door access methods by harnessing the power of biometric fingerprint recognition. Traditional lock-and-key systems are susceptible to security breaches due to lost or stolen keys, prompting the need for advanced access control solutions. This project is motivated by the uniqueness and reliability of fingerprints as a secure means of identification. By integrating fingerprint recognition with a motorized locking mechanism, the project aims to provide a robust yet user-friendly solution for secure door access.

The project's scope encompasses the development of a comprehensive system that seamlessly incorporates a fingerprint scanner, secure communication protocol, user-friendly interface, and motorized lock. This system holds potential significance in enhancing security protocols for both residential and commercial environments. Furthermore, its innovative approach showcases the project's commitment to addressing security concerns while embracing the convenience of biometric technology.

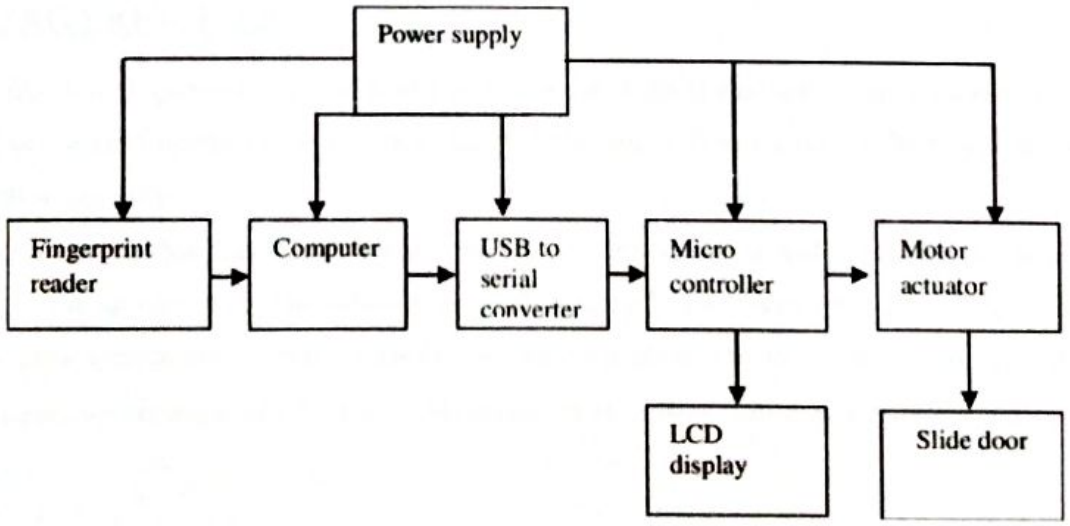

Fig 1.1 Block diagram of biometric security lock system

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An ASSIGNMENT REPRORT ON

"Fingerprint Door Unlock System"

Submitted as assignment work

MICROCONTROLLER AND EMBEDDED SYSTEMES (21CS43)

BY

PRERAN.E	4AL21CS104
RAKESH.AP	4AL21CS112
PRUTHVI.BR	4AL21CS106
MOHAMMED YASEER	4AL21CS075
MOHAMMED ILIYAS	4AL21CS074
MOHITH.R	4AL21CS076

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Fingerprint Door Unlock System

Introduction:

The fingerprint door lock system represents a pinnacle of modern security technology, seamlessly merging convenience with high-level protection. At its core, this innovative system relies on the unique patterns encoded within an individual's fingerprints to grant or deny access to a secure area. By harnessing the distinctive ridges and valleys that constitute a person's fingerprint, this system eliminates the need for traditional keys or numerical codes, offering a touch-and-go approach to unlocking doors. This biometric marvel not only provides heightened security but also eradicates the hassle of misplaced keys or forgotten combinations.

Intricately designed, the fingerprint door lock system consists of several key components working in tandem to ensure its functionality. The heart of the system lies within its fingerprint sensor, which employs advanced optical or capacitive technology to capture the minute details of a fingerprint. When a user places their fingertip on the sensor, the system's algorithm processes the image, extracting unique minutiae points that are used to generate an encrypted template. This template is then compared to stored templates in the system's database to verify the user's identity. The process is swift and accurate, granting access only to authorized individuals and preventing unauthorized entry.

The advantages of a fingerprint door lock system are abundant and diverse. Unlike traditional locks that can be picked or bypassed, this system provides an unparalleled level of security. Each person's fingerprint is inherently unique, making it virtually impossible to replicate without sophisticated equipment and intricate knowledge. This effectively deters potential intruders and enhances the peace of mind for property owners. Moreover, the touch-and-go mechanism saves time and effort, especially in scenarios where fumbling for keys is impractical or in adverse weather conditions. Elderly individuals and those with disabilities also benefit from the system's user-friendly interface, as it eliminates the need to physically manipulate keys or remember complex codes.

Businesses and organizations have embraced fingerprint door lock systems to bolster security within their premises. These systems can be seamlessly integrated into existing security protocols, providing an additional layer of defense against unauthorized access. In corporate settings, sensitive areas such as server rooms or executive offices require stringent access controls, which can be efficiently managed through fingerprint authentication. This not only prevents data breaches and theft but also creates an auditable trail of access, aiding in investigations if any security breaches occur.

In residential applications, the fingerprint door lock system redefines the concept of home security. Homeowners can rest assured that their valuables and loved ones are protected by a technology that is both unobtrusive and reliable. Parents can ensure that only authorized individuals can enter their homes, providing a safe environment for their children. Moreover, the elimination of physical keys minimizes the risk of break-ins through lock-picking or key duplication. This resonates strongly in the age of smart homes,

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BELAGAVI - 590 018

HYDROGEN GAS DETECTOR USING ARDUINO

Submitted as Subject Assignment Work for

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

BY

SHIVA SHARAN	4AL21CS140
SHREYA ANIL PATIL	4AL21CS145
SMITA NAIK	4AL21CS150
SONALI SHETTY	4AL21CS151
VIJAYALAXMI M K	4AL21CS176
VINAY B H	4AL21CS180
YAMUNA R	4AL21CS188

Under The Guidance Of

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Mrs.Babitha Poojary
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&

Mr Abhijith Kotian
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Hydrogen Gas Detector Using Arduino Uno

1. Abstract:

This report is about a Hydrogen Gas Detector developed using the Arduino Uno platform. The detector employs sensor technology to accurately identify the presence of hydrogen gas in the environment. The system offers a cost-effective solution for monitoring hydrogen gas levels in various settings, including industrial and laboratory environments.

2. Introduction:

The "Hydrogen Gas Detector Using Arduino Uno" project addresses the crucial need for reliable gas detection in diverse applications. Hydrogen gas, while widely used in various industries, poses inherent risks due to its flammability and potential for explosive mixtures. This project combines sensor technology with the Arduino Uno microcontroller to create an efficient and cost-effective gas detection system. By providing an early warning mechanism, the project aims to enhance safety measures and prevent potential accidents. This introduction sets the stage for understanding the significance of the project in promoting safer work environments and facilitating better control over hydrogen gas exposure.

3.Components Used:

- ARDUNIO UNO
- MQ-2 GAS SENSOR
- RED & GREEN LED
- BUZZER

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

An ASSIGNMENT REPORT ON

Hydrogen Gas Leakage & Alarm System

Submitted as Microcontroller and Embedded System

By

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K G SHREYA	4AL21CS052
JANUARY	4AL22CS404
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2022 – 2023

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1. INTRODUCTION

Liquefied petroleum gas is the abbreviation for LPG. This is a kind of non-renewable source. It contains more than three carbon atoms. They are mainly propane and butane. This gas is easily set on fire and must be concealed from cause of combustion and kept in highly opened region. This is odorless in its unrefined circumstances. The fragrance we note was entirely from the different gas handler called Ethyl Mercaptan. This material was top-up with the gas when it is out from main chamber areas.

In this project, we have planned to design an automatic gas leak alarm system byusing Arduino Uno board. Arduino Uno contains IC (ATMEGA 328p) plays a vital role- in microcontroller family. It is user friendly and the whole board can be controlled by using c programming. Gas leak identification is mainly designed to detect the LPG (liquid petroleum gas) which is one of the most harmful gas. These kind of gases mostly used in small scale industries & for indoor use as a cooking gas. In our platform MQ (series) sensors are mainly used for detection of gas. In MQ series we used MQ6 sensors, because they are very sensitive to petroleum gases like butane propane. MQ6 sensor activates only when the level of leaked gases reaches the threshold value at normal atmospheric air. Hence it acts as an input for Arduino. On the output side we used a suitable exhaust fan and buzzer is added. The exhaust fan is used to compensate the leaked gas with the atmosphere and the buzzer is used to alert people about the gas

2. DIAGRAM

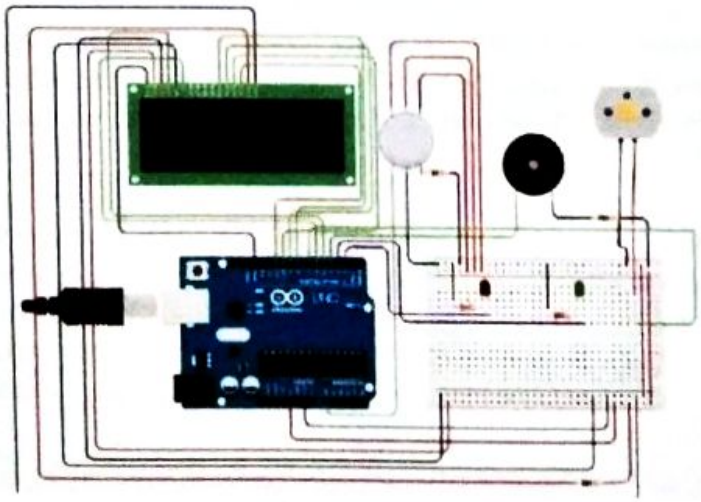

Fig 2.1

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Hydrogen Gas Sensor Circuit Built with an Arduino

Submitted as Microcontroller and Embedded System assignment work

BY

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Deepak TS	**4AL21CS037**
Kishor Rai	**4AL21CS060**
Likhith TS	**4AL21CS061**

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Hydrogen Gas Sensor Circuit Built with an Arduino

1.Introduction

Hydrogen gas (H_2), at room temperature and under standard pressure conditions, is tasteless, odorless, and colorless.

Hydrogen gas is receiving very special attention now because hydrogen is being used as an alternative energy source to operate certain new automobiles coming out in the auto industry now. The chemical energy of hydrogen is converted by a combustion method similar to current engines or in a fuel cell which produces water and electricity by reacting hydrogen with oxygen. Engineers and car manufacturers are researching the possibility of using hydrogen gas as a viable car fuel.

The hydrogen gas sensor we will use is the MQ-8 sensor. This is a sensor that is sensitive to effects of hydrogen gas.

2.Components Needed:

- MQ-8 Hydrogen Gas Sensor
- Arduino
- LED

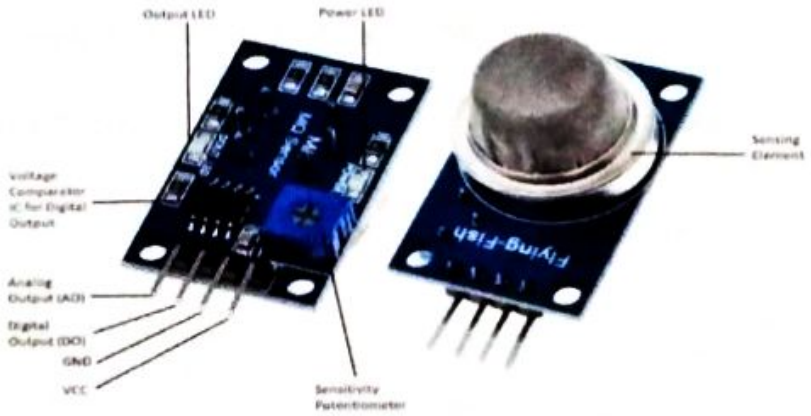

Fig 2.1:MQ-8 Hydrogen Gas Senso

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

AN ASSIGNMENT REPORT ON

IOT AIR AND SOIL POLLUTION MONITORING SYSTEM

Submitted as Microcontroller And Embedded System

assignment work

By

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IOT AIR AND SOUND MONITORING SYSTEM USING ARDUINO:

ABSTRACT:

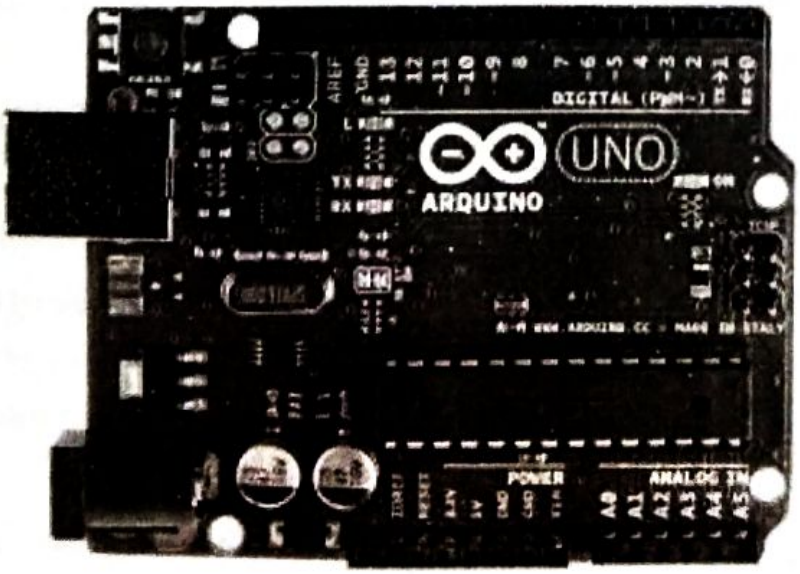
The IoT Air and Sound Monitoring System using Arduino is a project designed to monitor air quality and sound pollution levels in real-time. This system employs Arduino-based sensors to measure air pollutants and sound intensity. The collected data is then transmitted to the cloud through IoT connectivity, allowing for remote monitoring and analysis. This report provides an overview of the system's components, working principle, implementation steps, and potential applications.

INTRODUCTION:

Air pollution and sound pollution are critical environmental concerns that can affect human health and well-being. Monitoring these pollutants in real-time is essential for effective pollution management. The IoT Air and Sound Monitoring System aims to provide accurate and timely data to better understand and address these issues.

COMPONENTS USED:

1. Arduino board (Arduino Uno):



The Arduino board plays a central role in an IoT air and sound pollution monitoring system. It serves as the main microcontroller that interacts with sensors, processes data, establishes internet

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LINE FOLLOWER ROBOT

Submitted as microcontroller and embedded system assignment work

BY

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SHREYASH P S	4AL21CS147
SOORYA PRAKASH ACHARYA	4AL21CS152
SUDARSHAN SHETTY	4AL21CS159

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MICROCONTROLLER AND EMBEDDED SYSTEM REPORT

LINEFOLLOWERROBOT

LINEFOLLOWERROBOT

Introduction:

A Robot is any machine which is completely automatic, i.e. it starts on its own, decides its own way of work and stops on its own. It is actually a replica of human beings, which has been designed to ease human burden. It can be controlled pneumatically or using hydraulic ways or using the simple electronic control ways. The first industrial robot was Unimates built by George Devol and Joe Engelberger in the late 50's and early 60's.

Any robot is built on 3 basic laws:

- A robot should not harm the human being directly or indirectly.
- A robot should obey human orders unless and until it violates the first law.
- A robot should protect its own existence provided the 1st two laws are not violated.

Line follower robot

A line follower robot is a robot which follows a certain path controlled by a feedback mechanism.

Building a basic line follower robot:

Building a basic Line Follower Robot involves the following steps.

- Designing the mechanical part or the body of the robot

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

An ASSIGNMENT REPORT ON

Line Follower Robot

Submitted as subject assignment work,

for the subject

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

By

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Manoj P M	**4AL21CS068**
Nandan K L	**4AL21CS081**
Neerav V Patel	**4AL21CS084**
Pavan Kumar V	**4AL21CS082**

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Chapter 1

LINE FOLLOWER ROBOT

1.1 Introduction

The line follower robot is a simple robot that is based on automation that follows a specific direction based on a particular line, usually a dark line on a light surface. The robot consists of two sensors that are installed at the front end of the robot body and two wheels that are driven by DC motors. The circuit board present in the robot controls the wheel speed based on the input signal from the sensors. The controlling of the robot is done like that when the robot sees a black line it stops.

1.1.1 What is Line Follower Robot

Before talking about the line follower robot, let us understand what a robot is. A robot is basically an automated machine that works on itself without the presence or requirement of human beings and is implemented in such a way that it can do almost the same work, take the same burden of human being, bringing convenience and time saving for humans.

There are various ways to control a robot and George Devol introduced the first robot that was launched in the market in the early 1960s. There are some laws made for robots when it was launched.

- The first is that the robots should not do any harm to the public in any condition.
- The second is that robots should acknowledge human decisions, guidance, and advice.
- The third law is that if the first two laws do not violate the robot should protect itself from any cause.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

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Microcontroller and Embedded System (21CS43)

Submitted as subject assignment Report on
Soil moisture detection Project

BY

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CHETHAN M	**4AL21CS033**
ABHISHEK B K	**4AL21CS004**
ANDANI M R	**4AL21CS019**

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This is to certify that, assignment work for the subject " Microcontroller and Embedded System(21CS43)" has been successfully completed and submitted report by Andani M R- 4AL21CS019 during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and scored 9 Marks out of 10 and deposited in the departmental library.

Mrs.Abhijith Kotian
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SOIL MOISTURE SENSOR TO DETECT THE HUMIDITY OF WATER

1.Introduction:

we manage water usage in agriculture, landscaping, and other outdoor applications. These sensors play a crucial role in ensuring that plants receive the right amount of water at the right time, leading to improved water efficiency, healthier plants, and reduced costs.

These sensors work by measuring the moisture content in the soil, which directly relates to the available water for plant roots. They can be inserted into the ground at various depths, depending on the type of plants and the root zone. Soil moisture data collected by these sensors is then transmitted to a central control system, which can be a dedicated irrigation controller or part of a larger smart agriculture platform.

Smart irrigation systems utilize this real-time soil moisture information to make intelligent decisions about when and how much to water. By monitoring soil moisture levels, these systems can prevent overwatering, which can lead to water waste, root diseases, and nutrient leaching. Conversely, they also prevent underwatering, which can cause stress to reduce yields.

2.Block Diagram:

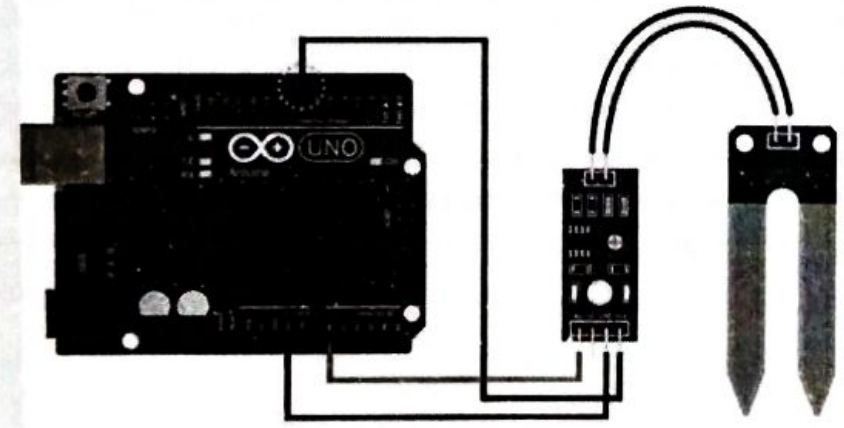

Fig.no:1.0 block diagram of soil moister detection.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI – 590 018

MICROCONTROLLER AND EMBEDDED SYSTEMS (21CS43)

Submitted as subject assignment work

BY

MANJUNATH D C	**4AL22CS406**
MANJUNATH K	**4AL22CS407**
PRASAD K	**4AL22CS408**
S ROOPESH	**4AL22CS409**
SAMPATH G M	**4AL22CS410**
SANAGMESH S	**4AL22CS411**

Under the Guidance of

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2022– 2023

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Introduction

In an era defined by technological innovation and efficiency-driven solutions, traditional methods of attendance tracking have given way to more advanced systems. The Radio Frequency Identification (RFID) Attendance System stands at the forefront of this transformation, revolutionizing how attendance is recorded, managed, and analyzed across various domains. This introduction provides a glimpse into the fundamental concepts and significance of the RFID Attendance System.

1.1 Evolution of Attendance Tracking

From manual paper-based registers to barcode scanners, the evolution of attendance tracking has been driven by the quest for accuracy, convenience, and automation. The limitations of manual processes, prone to errors and inefficiencies, have paved the way for technology-driven solutions that streamline administrative tasks and enhance data integrity. The RFID Attendance System represents a pivotal advancement in this journey, harnessing the power of radio frequency communication to redefine how attendance is captured and utilized.

1.2 Understanding RFID Technology

At its core, the RFID Attendance System operates on RFID technology, a wireless communication methodology that enables the identification and tracking of objects or individuals using radio waves. RFID systems consist of RFID tags, which are attached to objects or carried by individuals, and RFID readers that communicate with these tags. The technology enables seamless data exchange between the tags and readers, allowing for real-time identification and data capture.

1.3 The RFID Attendance System's Significance

The significance of the RFID Attendance System extends beyond mere automation. This system addresses the shortcomings of conventional methods and introduces a range of benefits that impact diverse sectors such as education, workplaces, and event management.

1.3.1 Accuracy and Data Integrity

Manual attendance tracking methods are susceptible to human errors, leading to inaccurate records. RFID technology eliminates this concern by providing a precise and reliable means of data capture. Each RFID tag carries a unique identifier, ensuring that the attendance of each individual is accurately recorded without the potential for duplication or manipulation.

1.3.2 Efficiency and Time Savings

Traditional attendance processes involve manual data entry, which consumes valuable time and human resources. The RFID Attendance System automates this process, instantly recording attendance as individuals pass through designated areas equipped with RFID readers. This automation not only reduces administrative workload but also minimizes disruptions to daily routines.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI - 590 018

Report on

Sonar Water Level Meter Using Arduino Uno

Submitted as Subject Assignment Work for

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

BY

SEETHALAKSHMI P	4AL21CS132
SRINIVAS M	4AL21CS155
SUHANA A NADAF	4AL21CS161
SULTAN NADAF	4AL21CS162
SUSHMA	4AL21CS166
VISHAL POONACHA K G	4AL21CS183

Under The Guidance Of

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(Assistant Professor) **(Assistant Professor)**

Report on Sonar Water Level Meter Using Arduino Uno

Abstract:

This report presents the development, working principle, and implementation of a Sonar Water Level Meter using an Arduino Uno microcontroller. The Sonar Water Level Meter utilizes ultrasonic waves to measure water levels accurately and is designed for applications such as tanks, reservoirs, and other water storage systems.

1. Introduction:

The measurement of water levels is crucial for various industrial, agricultural, and domestic purposes. Traditional methods may involve float switches or pressure sensors, but ultrasonic sensors provide a contactless and accurate alternative. This report focuses on the construction and operation of a Sonar Water Level Meter using an Arduino Uno and an ultrasonic sensor.

2. Components Used:

- Arduino uno
- LED and 12C module
- 5v relay
- Ultrasonic sensor
- Jumper wire
- Bread board

VISVESVARAYA TECHNOLOGICAL

UNIVERSITY,BELAGAVI – 590 018

An ASSIGNMENTREPORTON

Raspberry Pi Face Recognition-Based Door Lock

Submitted as subject assignment work,

for the subject

Microcontroller And Embedded System(21CS43)

By

Mohammed Ansar **4AL21CS072**

UndertheGuidanceof

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This is to certify that **Mohammed Ansar** bearing USN **4AL21CS072**has successfully demonstrated the working of Raspberry Pi Face Recognition-Based Door Lock as the assignment work for the subject **"Microcontroller and Embedded System(21CS43)"**and submitted a report during the academic year2022–23 even Semester. It is certified that all corrections/suggestions indicated in the presentation session have been in corporate into the report & scored Marks out of 10 and deposited in the department tallibrary.

09/10

Mrs. Babitha

Poojary Assistant Professor

Raspberry Pi Face Recognition-Based Door Lock

The face recognition-based phone unlocking system launched by Apple on its iPhones in 2017 took the world by storm and has been a disruptive technology since then in the smartphone industry. Similarly, home security, monitoring and automation devices have recently become an integral part of many people's lifestyle. A previous maker.io blog explained the complete ecosystem, the common sensors in existing commercial products, and the common concepts for the maker community.

BOM

- Raspberry Pi 4B
- Raspberry Pi Camera Module V2
- Jumper Cables
- Servo Motor
- LED Touch Screen 4.3 inches
- Raspberry Pi4 USB-C Power Supply

Introducing the Project

Computer vision technology has been an area of active research for decades because the possibilities of applications are innumerable. The common applications of computer vision and image processing include text recognition, depth perception, visual odometry, object detection and recognition, pose estimation, human face detection and recognition, among many others.

Detecting and recognizing objects in a camera's field of view is a very important task with applications in automation, robotics, and manufacturing industries.

The Difference Between Detecting and Recognizing a Face

Face Detection is the application of image processing techniques to determine if the image is/has a human face or not. It is analogous to object detection, but the distinct and consistent features of the human face make face detection a more informed task achievable by hand-tuned feature descriptors and conventional image processing methods. Face detection is the precursor to face recognition. Face detection in a scene with multiple people or objects introduces challenges in localization of the bounding box for the face.

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AN ASSIGNMENT REPORT ON

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

Submitted as Subject assignment work

BY

Jnaneshwari U S	**4AL21CS051**
Harshitha S	**4AL21CS047**
Bhoomika M	**4AL21CS028**
Madhura B S	**4AL21CS063**
Bhavana M C	**4AL22CS402**

Under the Guidance of

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Report on the Automated Self-Opening and Closing Dustbin

INTRODUCTION:

Waste management is a critical aspect of maintaining cleanliness and hygiene in both residential and public spaces. Traditional manual dustbins, while effective in collecting waste, often pose challenges such as the need for physical contact and the potential for waste spillage during use. To address these issues, the Mechanical and Electrical Engineering Society (MCES) embarked on the Smart Dustbin project.

The Smart Dustbin project represents a convergence of mechanical and electrical engineering expertise to design and construct a revolutionary waste disposal solution. At its core, this project seeks to eliminate the need for physical interaction with a dustbin, offering a hands-free, hygienic, and user-friendly experience for disposing of waste.

The motivation behind this project stems from the growing demand for innovative technologies that enhance our daily lives. In an era of smart homes and automation, traditional waste disposal methods have lagged behind. This project endeavors to bridge that gap by infusing automation into a mundane yet essential aspect of our daily routines.

The conventional method of operating a dustbin involves manual intervention, which can be unhygienic and inconvenient. The Smart Dustbin project addresses this issue by developing a dustbin that opens and closes automatically, thus promoting cleanliness and ease of use.

Key Objectives:
The project's primary objectives encompass a holistic approach to modernizing waste disposal:

Design a dustbin with an automated lid-opening mechanism: The project aims to create a dustbin that can autonomously open and close its lid, eliminating the need for manual contact with potentially contaminated surfaces.

Implement a sensor-based system for lid movement: To achieve seamless automation, the dustbin incorporates state-of-the-art sensor technologies capable of detecting when a user approaches and when to open or close the lid.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

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An ASSIGNMENT REPORT ON

Smart parking system using Arduino and IR sensor

Submitted as subject assignment work,

for the subject

Microcontroller And Embedded System (21CS43)

By

Mallikarjun	**4AL21CS065**
Manohar Naik	**4AL21CS066**
Mohammad Khalander	**4AL21CS074**
Puneeth C K	**4AL21CS107**
Rakesh	**4AL21CS111**

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This is to certify that **Mallikarjun** bearing USN **4AL21CS065** has successfully demonstrated the working of **Smart parking system using Arduino and IR sensor** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 even Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Mohammad Khalander** bearing USN **4AL21CS074** has successfully demonstrated the working of **Smart parking system using Arduino and IR sensor** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 even Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that **Rakesh** bearing USN **4AL21CS111** has successfully demonstrated the working of **Smart parking system using Arduino and IR sensor** as the assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 even Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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Assistant Professor

Smart Parking System using Arduino and IR Sensor

1.Introduction:

In these modern days finding car parking is a big issue in congested cities. There are too many vehicles on the road but not enough parking spaces. One of the biggest problems is when we enter a parking area then we realize that there are no empty parking slots to park our cars. Important time. Another biggest problem is after entering in a big parking area we confused to find the empty parking slot to park our car. Sometimes maybe we all have been facing these two problems that wasted our important time. That's why we need efficient parking management systems in all parking areas that will provide confusion-free and easy parking.

In this report, we will design a "Smart Parking System Project" to overcome this problem. This project helps the car's driver to park their car with minimum wastage of time with accurate information of the availability of the space to park.

2.Smart Parking System Project Concept:

This smart parking system project consists of Arduino, six IR sensors, one servo motor, and one LCD display. Where the Arduino is the main microcontroller that controls the whole system. Two IR sensors are used at the entry and exit gates to detect vehicle entry and exit in the parking area. And other four IR sensors are used to detect the parking slot availability. The servo motor is placed at the entry and exit gate that is used to open and close the gates. Also, an LCD display is placed at the entrance, which is used to show the availability of parking slots in the parking area.

When a vehicle arrives at the gate of the parking area, the display continuously shows the number of empty slots. If there have any empty slots then the system opens the entry gate by the servo motor. After entering the car into the parking area, when it will occupy a slot, then the display shows this slot is full.

If there is no empty parking slot then the system displays all slots are full and does not open the gate.

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SMART PARKING SYSTEM

Submitted as Subject Assignment Work for

MICROCONTROLLER AND EMBEDDED SYSTEM (21CS43)

BY

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SHUBHANGA C S	4AL21CS149
VRUSHAB JAIN	4AL21CS186
VYSHAK NARASIMHA M V	4AL21CS1187
VINAY N DODDAMANI	4AL21CS179
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This is to certify that, assignment work for the subject "**Microcontroller and Embedded System (21CS43)**" has been successfully completed and report submitted by **SUMITH K S (4AL21CS164),** during the academic year 2022– 2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and scored 9 Marks out of 10 and deposited in the departmental library.

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(Assistant Professor)

&

Mr Abhijith Kotian
(Assistant Professor)

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This is to certify that, assignment work for the subject "**Microcontroller and Embedded System (21CS43)**" has been successfully completed and report submitted by **SHUBHANGA C S (4AL21CS149),** during the academic year 2022– 2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and scored 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "**Microcontroller and Embedded System (21CS43)"** has been successfully completed and report submitted by **VRUSHAB JAIN (4AL21CS186),** during the academic year 2022– 2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and scored 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "**Microcontroller and Embedded System (21CS43)**" has been successfully completed and report submitted by **VYSHAK NARASIMHA M V (4AL21CS187),** during the academic year 2022– 2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and scored 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "**Microcontroller and Embedded System (21CS43)"** has been successfully completed and report submitted by **VINAY N DODDAMANI(4AL21CS179),** during the academic year 2022– 2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and scored 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "**Microcontroller and Embedded System (21CS43)**" has been successfully completed and report submitted by **VISHWARADHYA (4AL21CS185),** during the academic year 2022– 2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and scored 9 Marks out of 10 and deposited in the departmental library.

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SMART PARKING SYSTEM

Introduction

The growing urbanization and the increasing number of vehicles on the road have led to significant challenges in managing parking spaces efficiently. Traditional parking systems often result in congestion, wasted time, and increased pollution. To address these issues, smart parking systems have emerged as a transformative solution, leveraging advanced technologies to streamline and optimize parking operations. This report provides an overview of smart parking systems, their key components, and benefits.

Smart parking systems go beyond the limitations of traditional methods by utilizing various cutting-edge components. Sensors, such as ultrasonic sensors, infrared sensors, or cameras, are strategically installed to monitor parking space occupancy in real-time. The data collected from these sensors is communicated through a network, enabling drivers to access real-time parking availability information remotely through user-friendly mobile applications or websites. This technology not only empowers drivers to quickly locate available parking spots but also contributes to reducing traffic congestion and greenhouse gas emissions. The benefits of smart parking systems are far-reaching. By providing real-time parking availability information and optimizing space utilization, they enhance the overall user experience, saving drivers time and effort in finding suitable parking spaces. Furthermore, these systems align with sustainability initiatives by encouraging eco-friendly transportation through the provision of electric vehicle charging stations and promoting reduced fuel consumption. A smart car parking system gives a visual output indicating an available parking space rather than driving aimlessly. The driver looks up to the row of LED lights and their colour to deduct a result of determining the parking space availability. The two main colours used are red and yellow stating occupied and free respectively. These lights are placed at the ceiling of each parking space and the driver looks up and follows the set of LEDs and searches for a Yellow one. These lights are controlled automatically with sensors and the feedback is provided through the colour of the LED when a vehicle is detected. This system not only makes accessibility easy but also manages the congestion of vehicles avoiding long search and wait times. A smart car parking system gives a visual output indicating an available parking space rather than driving aimlessly. The driver looks up to the row of LED lights and their colour to deduct a result of determining the parking space

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

An ASSIGNMENT REPORT ON

Temperature Control DC Fan Using Arduino

Submitted as subject assignment work,

for the subject

Micro Controller and Embedded System (21CS43)

By

NAREN N	**4AL21CS083**
PAVAN HL	**4AL21CS091**
RAHUL GOWDA GV	**4AL21CS110**
RAMITH S SHETTY	**4AL21CS114**
HAMSENDRA JAIN	**4AL21CS120**
S MOHAN RAJ	**4AL21CS121**

Under the Guidance of

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This is to certify that Naren N bearing USN 4AL21CS083 has successfully demonstrated the Temperature Control for DC Fan Using Arduinos the assignment work for the subject **"Micro Controller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that Pavan HL bearing USN 4AL21CS091 has successfully demonstrated the Temperature Control for DC Fan Using Arduino as the assignment work for the subject **"Micro Controller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that Rahul Gowda bearing USN 4AL21CS110 has successfully demonstrated the Temperature Control for DC Fan Using Arduinoas the assignment work for the subject **"Micro Controller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that RAMITH S SHETTY bearing USN 4AL21CS114 has successfully demonstrated the Temperature Control for DC Fan Using Arduinos the assignment work for the subject **"Micro Controller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that HAMSENDRA JAIN bearing USN 4AL21CS120 has successfully demonstrated the Temperature Control for DC Fan Using Arduino as the assignment work for the subject **"Micro Controller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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This is to certify that S Mohan Raj bearing USN 4AL21CS121 has successfully demonstrated the Temperature Control for DC Fan Using Arduino as the assignment work for the subject **"Micro Controller and Embedded System (21CS43)"** and submitted a report during the academic year 2022–23 odd Semester. It is certified that all corrections/suggestions indicated in the presentation session have been incorporated into the report & scored 09 Marks out of 10 and deposited in the departmental library.

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Temperature Control System for DC Fan using Arduino

1. Introduction:

Temperature control systems play a pivotal role in a wide range of applications, from industrial processes to home appliances. Efficient temperature regulation is essential for maintaining optimal operating conditions, preventing overheating, and ensuring the longevity of equipment. This project focuses on the design and implementation of a temperature control system that utilizes an Arduino microcontroller to regulate the speed of a DC fan based on the ambient temperature.

1.1 Motivation:

The need for temperature control arises in various scenarios, such as computer systems, electronic enclosures, greenhouse environments, and more. By creating a temperature control system using readily available components and an Arduino, we can achieve an automated and precise solution for maintaining desired temperature levels. This project aims to showcase the versatility of the Arduino platform in building practical and cost-effective temperature control systems.

1.2 Objectives:

The primary objectives of this project are as follows:

1. Develop a temperature sensing mechanism using a suitable temperature sensor.
2. Interface the temperature sensor with an Arduino to measure the ambient temperature.
3. Design a control algorithm to dynamically adjust the speed of a DC fan based on temperature readings.
4. Implement the control algorithm to regulate the fan speed effectively.
5. Provide insights into the potential applications and future enhancements of the temperature control system.

1.3 Scope:

The scope of this project includes the hardware and software design necessary for temperature sensing, data processing, and fan speed control. It does not encompass complex control strategies or wireless communication. The project focuses on demonstrating a fundamental temperature control concept that can serve as a foundation for more advanced applications.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

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TEMPERATURE CONTROLLER USING AURDINO

Submitted as microcontroller and embedded System assignment work

BY

SHARTH AL	**4AL21CS134**
SRIRAM PRASAD M	**4AL21CS157**
SUBRAHMANYA J G	**4AL21CS158**
VERRESH AKKI	**4AL21CS172**
VENKATESH HULSAD	**4AL21CS175**
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This is to certify that, assignment work for the subject "Microcontroller and embedded System" has been successfully completed and report submitted by SRIRAM PRASAD M bearing USN 4AL21CS159 during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and score 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "Microcontroller and embedded System" has been successfully completed and report submitted by SUBRAHMANYA J G bearing USN 4AL21CS158 during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and score 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "Microcontroller and embedded System" has been successfully completed and report submitted by THUMMISI TAGORE SREEVAN bearing USN 4AL21CS168 during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and score 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "Microcontroller and embedded System" has been successfully completed and report submitted by VEERESH AKKI bearing USN 4AL21CS172 during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and score 9 Marks out of 10 and deposited in the departmental library.

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This is to certify that, assignment work for the subject "Microcontroller and embedded System" has been successfully completed and report submitted by VENKATESH H HULASAD bearing USN 4AL21CS175 during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report and score 9 Marks out of 10 and deposited in the departmental library.

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Mrs. Babitha Poojary
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Topic: Temperature dependent DC fan

ABSTRACT:

This report presents the design, implementation, and evaluation of a temperature-dependent DC fan control system utilizing the Arduino microcontroller platform. In today's world, efficient thermal management is crucial for various applications, including electronics, industrial processes, and renewable energy systems. The ability to control fan speed based on temperature variations is essential for maintaining optimal operating conditions and preventing overheating.

The project's main objective was to develop an intelligent and cost-effective solution for temperature-dependent fan control. The system utilizes an Arduino microcontroller, which provides a flexible and user-friendly platform for programming and interfacing with various sensors and devices. A temperature sensor (such as a thermistor or DS18B20) was employed to measure the ambient temperature accurately.

The control algorithm implemented on the Arduino continuously monitors the temperature readings from the sensor. When the temperature exceeds a predefined threshold, the DC fan is activated with an appropriate speed level to dissipate excess heat. As the temperature decreases, the fan speed is adjusted to maintain the desired temperature range.

Introduction

Project Overview:

The DC Temperature Controlled Fan project involves designing a system to regulate the speed of a DC fan based on the surrounding temperature. This concept finds applications in various domains, including electronics cooling, industrial automation, and energy conservation.

Objectives:

The primary objectives of this project are:

- To design and implement a temperature-controlled fan system.
- To develop a responsive and accurate temperature sensing mechanism.
- To create a control algorithm that adjusts fan speed according to temperature variations.
- To evaluate the system's performance, efficiency, and practicality.

Significance

The project contributes to energy efficiency by enabling the fan to operate only when necessary, reducing power consumption. It also showcases the integration of sensors and microcontrollers for real-world applications.

Components and Materials:

- The project requires the following components:

Arduino Uno: The Arduino Uno is a popular microcontroller board that is widely used for creating various electronics projects and prototypes.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

BELAGAVI – 590 018

Assignment report on

Temperature Dependent DC Fan

Submitted as Subject assignment for microcontroller and embedded System (21CS43)

BY

ABHIRAM A GOWDA	**4AL21CS003**
ALLEN ENOCH	**4AL21CS017**
ANURAG M S	**4AL21CS023**
GOPAL	**4AL21CS043**

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Temperature dependent DC fan

ABSTRACT:

This report presents the design, implementation, and evaluation of a temperature-dependent DC fan control system utilizing the Arduino microcontroller platform. In today's world, efficient thermal management is crucial for various applications, including electronics, industrial processes, and renewable energy systems. The ability to control fan speed based on temperature variations is essential for maintaining optimal operating conditions and preventing overheating.

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The control algorithm implemented on the Arduino continuously monitors the temperature readings from the sensor. When the temperature exceeds a predefined threshold, the DC fan is activated with an appropriate speed level to dissipate excess heat. As the temperature decreases, the fan speed is adjusted to maintain the desired temperature range.

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Objectives:

The primary objectives of this project are:

- To design and implement a temperature-controlled fan system.
- To develop a responsive and accurate temperature sensing mechanism.
- To create a control algorithm that adjusts fan speed according to temperature variations.
- To evaluate the system's performance, efficiency, and practicality.

Significance

The project contributes to energy efficiency by enabling the fan to operate only when necessary, reducing power consumption. It also showcases the integration of sensors and microcontrollers for real-world applications.

Components and Materials:

- The project requires the following components:

Arduino Uno: The Arduino Uno is a popular microcontroller board that is widely used for creating various electronics projects and prototypes.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

An ASSIGNMENT REPORT ON

Wireless Android Robot Control via Bluetooth

Submitted as Microcontroller And Embedded System

assignment work

By

AKSHATHA	**4AL21CS014**
DEEKSHA S.SHET	**4AL21CS035**
GAYATRI C B	**4AL21CS042**
K P MADHAVI	**4AL21CS057**
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This is to certify that, assignment work for the subject **"Microcontroller and Embedded System (21CS43)"** has been successfully completed and report submitted by ARCHANA G.HUBLIKAR (4AL22CS401), during the academic year 2022–2023. It is certified that all corrections/suggestions indicated presentation session have been incorporated in the report & scored 9 Marks out of 10 and deposited in the departmental library.

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Chapter 1

Wireless Android Robot Control via Bluetooth

Abstract

This report presents the creation of an Android-controlled robot using Bluetooth technology. The project focuses on establishing a wireless link between an Android device and a robot for remote control. The robot comprises a chassis, microcontroller, Bluetooth module, and motor driver circuit. The Android app, developed in Android Studio, allows users to control the robot's movements via Bluetooth. The microcontroller interprets app commands and controls the motors, enabling accurate motion. Challenges addressed include Bluetooth pairing and minimizing latency. The project demonstrates successful integration of mobile technology and robotics, highlighting its potential in various applications.

1.1 Introduction

In the ever-evolving landscape of robotics and mobile technology, the fusion of these two domains has led to remarkable advancements, opening avenues for innovative applications. One such promising endeavor is the development of an Android-controlled robot using Bluetooth technology. This project revolves around the idea of seamless remote control, where an Android device serves as the interface for directing the movements of a robotic platform.

The concept of remote-controlled robots has captivated human imagination for decades, finding utility in diverse sectors such as education, entertainment, industrial automation, and beyond. This project embraces this concept by capitalizing on the ubiquity and versatility of smartphones, particularly those powered by the Android operating system, and the convenience of Bluetooth communication.

The project's fundamental premise lies in the harmonious interaction between hardware and software. A robot chassis, equipped with the essential components for locomotion, takes center stage. A microcontroller unit acts as the brain, interpreting instructions from the Android app and translating them into motor control signals. Through a Bluetooth module, the Android app establishes a wireless communication link with the robot, enabling real-time command transmission.

This report delves into the intricate details of crafting an Android-controlled robot using Bluetooth. It encompasses the hardware setup, software development process, Bluetooth communication mechanism, challenges faced, and future prospects. By exploring this dynamic integration of mobile technology and robotics, we gain insights into the potential transformative impact of such collaborations in shaping the way we interact with and harness robotic systems.