Students Project 2023-24

Sr. No	Name of Project	Student
1	IoT BASED FLOOD ALERT SYSTEM	Miss. Trupti Arvind Kumbhar
		Miss. Rutuja Sunil Jadhav
2.	IOT BASED SMART IRRIGATION SYSTEM	Miss. Desai Sejal Anil
		Miss. Terani Akshata Sanjay
3.	LPG Gas Detector	Mr. Yash Swami
		Mr. Shivam Shinde
4.	"RADAR SYSTEM USING ARDUINO	Mr. Sudarshan R. Patil
		Mr. Shubham S. Pawar
5	ARDUINO BASED SALINE MONITORING SYSTEM	Miss. Ananya Netaji Jadhav
		Miss. Dipti Dilip Patil Miss.
		Snehal Bhikaji Chavan
6	Smart Washroom using Arduino	MR. Siddharth Vikas Anchi
		Mr. Vivek Vasant Buchade
7.	VOICE CONTROLLED HOME AUTOMATION	Mr. Rohit A. Chougule
		Mr. Sourav S. Gadkari
		Mr. Samir B. Pendhari

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

(Dr. C. B. Patil)
HEAD
DEPARTMENT OF ELECTRONICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

PROJECT WORK

ENTITLED

" IOT BASED FLOOD ALERT SYSTEM "

SUBMITTED TO

DEPARTMENT OF ELECTRONICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

BY

Miss. TRUPTI ARVIND KUMBHAR

Miss. RUTUJA SUNIL JADHAV

PROJECT GUIDES

Dr. M. S. PATIL

Mr. N. P. MOTE

2023-2024

PROJECT WORK

Entitled

" IoT BASED FLOOD ALERT SYSTEM "

Submitted to

Department of Electronics

Vivekanand College, Kolhapur

(Empowered Autonomous)

By

Miss. Trupti Arvind Kumbhar

Miss. Rutuja Sunil Jadhav

Project Guides

Dr. M. S. Patil

Mr. N. P. Mote

2023-2024

CERTIFICATE

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

DEPARTMENT OF ELECTRONICS

This is to certify that Miss. Rutuja Jadhav and Miss. Trupti Kumbhar students of B. Sc. III (Electronics) class has satisfactory completed the project entitled **"IoT based flood Alert System"** as a partial fulfilment of Electronics practical examination conducted by the college during the year 2023-24.

Teacher in Charge

Examiner

Head of Department

HEAD
DEPARTMENT OF ELECTRONICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

ACKNOWLEDGEMENT

At this moment of accomplishment, we are presenting our work with great pride and pleasure, we would like to express our sincere gratitude to all those who helped us in the successful completion of our venture. First of all, we would like to thank our Principal Prof. Dr. R. R. Kumbhar who provided us with all facilities and amenities for the development of our projects. We would like to thank our HOD, Dr. C. B. Patil for helping us in the successful accomplishment of our project. We would also like to thank our project guide Dr. M. S. Patil and Mr. N. P. Mote who gave us constant guidance and support throughout this journey of turbulence. We are exceedingly grateful to our staff, Mr. P. R. Bagade, Dr. P. S. Jadhav, and Mr. G. B. Jirage for his timely and valuable suggestions. We also sincerely thank Mr. Rohit Nigave and Mr. M. D. Jangam, Lab Technicians, department of Electronics for their constant support and encouragement for our project. We would also like to thank our parents and friends for their over whelming and whole hearted encouragement and support without which this would not have been successful. Above all we thank God almighty for constantly motivating us with his love, and giving us courage at each stride to step forward with confidence and self-belief

Miss. Trupti Arvind Kumbhar

Miss. Rutuja Sunil Jadhav

INDEX

Introduction

We are aware of the flooding incidents that take place in majority of the Indian States each year leading to massive destruction of both lives and property. To detect a flood, the system we observed various natural factors like humidity, temperature water level, and flow level.

The system consists of different sensors for collecting data on the above-mentioned natural factors:

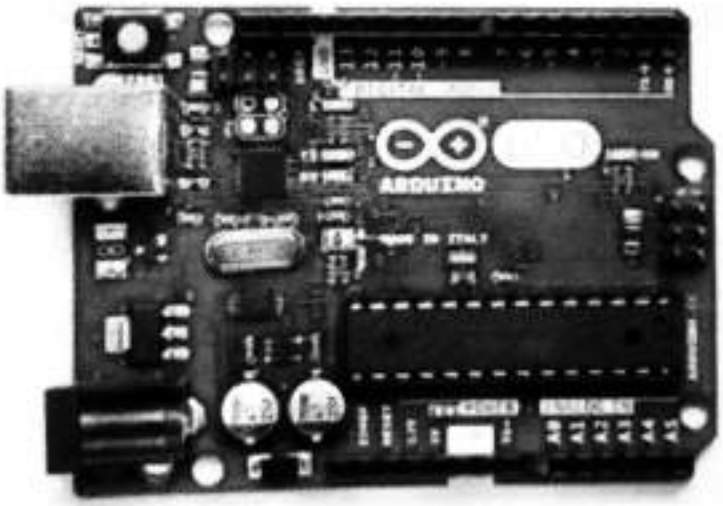
1. DHT11 (Temperature-Humidity Sensor): It is an advanced and popular sensor module used to detect the changes in humidity and temperature. It consists of resistive humidity and temperature detection components.
2. Flow Sensor: It is an advanced sensor that detects the flow of water. It consists of a plastic valve body, a water rotor, and Hall-Effect sensor. As the water level rises and falls the working is occurred by its opening and closing the circuit. When circuit is closed, no electricity passes which makes the circuit incomplete and it is in rest position. When circuit is closed, the water level drops below a predetermined point to complete the circuit and alarm is triggered.
3. HC-SR04 (Ultrasonic Sensor): It is an advanced Ultrasonic sensor used to measure the distance using ultrasonic waves. The sensor will be continuously monitoring the water level in terms of distance, and when the water level crosses the threshold, Email Alerts are triggered.

Hardware Components

If we consider the hardware requirements for our project, the following are the primary hardware tools that we are using to construct the voice-controlled home utilities via Android phone.

ARDUINO UNO:

We are utilizing an Arduino Uno, which is a circuit board with an ATmega328 built right in. It features six analog pins, a USB connection connector, a power jack, a reset button, and 14 digital input/output pins, six of which can be used as PWM output pins. This microcontroller is extremely simple and basic for demonstration purposes. The Board can be powered by a battery, an AC-to-DC adapter, or a USB cable that is plugged into a computer. One of this microcontroller's other finest qualities is that its CPU has a significant amount of RAM, ROM, and other components.

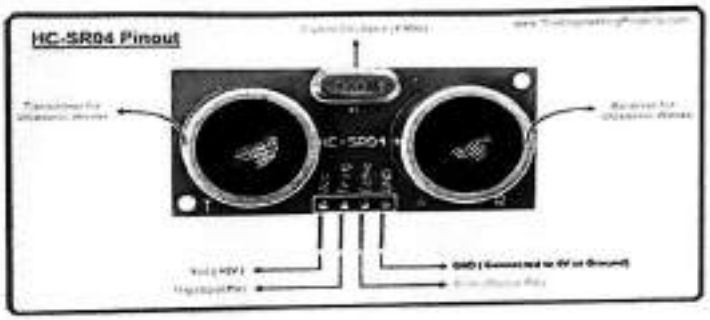


ULTRASONIC SENSOR MODULE:

Ultrasonic sensor is electronic devices that calculate the target's distance by emission of ultrasonic sound waves and convert those waves into electrical

signals. The speed of emitted ultrasonic waves traveling speed is faster than the audible sound. There are mainly two essential elements which are the transmitter and receiver. Using the piezoelectric crystals, the transmitter generates sound, and from there it travels to the target and gets back to the receiver component.

Ultrasonic sensor working principle is either similar to sonar or radar which evaluates the target/object attributes by understanding the received echoes from sound/radio waves correspondingly. These sensors produce high-frequency sound waves and analyze the echo which is received from the sensor. The sensors measure the time interval between transmitted and received echoes so that the distance to the target is known.



RELAY MODULE:

A Relay is a simple electromechanical switch. While we use normal switches to close or open a circuit manually, a Relay is also a switch that connects or disconnects two circuits. But instead of a manual operation, a relay uses an electrical signal to control an electromagnet, which in turn connects or

disconnects another circuit. Relays can be of different types like electromechanical, solid state. Electromechanical relays are frequently used. Let us see the internal parts of this relay before knowing about it working. Although many different types of relay were present, their working is same. Every electromechanical relay consists of an consists of an

1. Electromagnet
2. Mechanically movable contact
3. Switching points and
4. Spring

Electromagnet is constructed by wounding a copper coil on a metal core. The two ends of the coil are connected to two pins of the relay as shown. These two are used as DC supply pins.

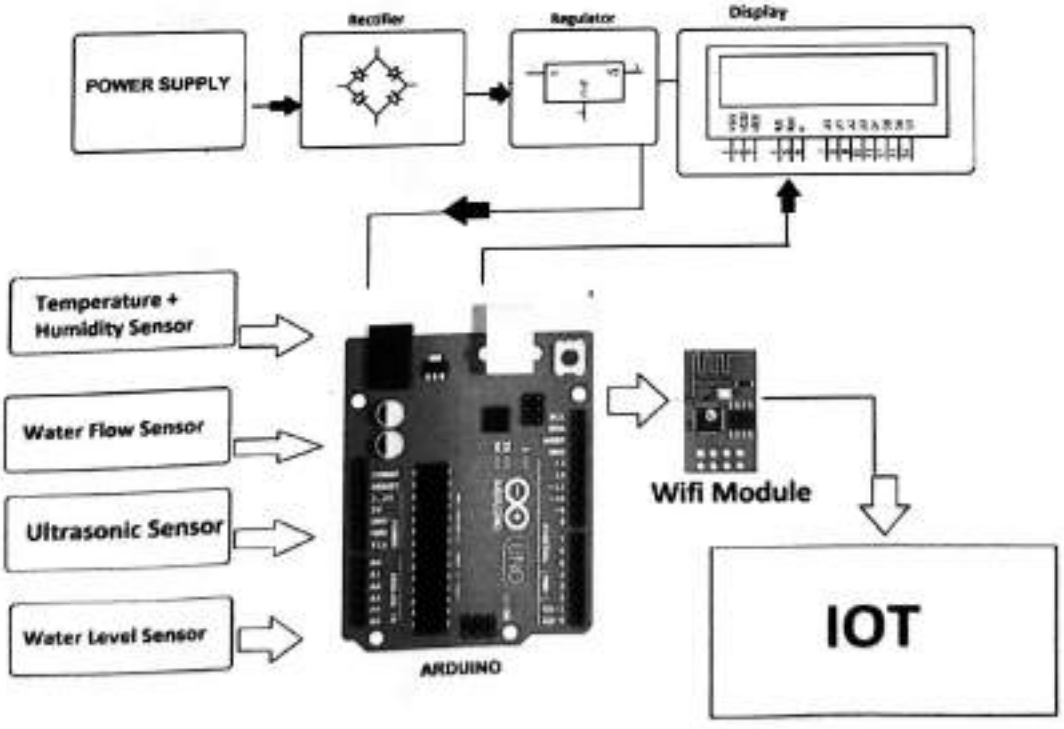
Wi-Fi MODULE:

An ESP8266 Wi-Fi module is a SOC microchip mainly used for the development of end-point IoT (Internet of things) applications. It is referred to as a standalone wireless transceiver, available at a very low price. It is used to enable the internet connection to various applications of embedded systems. It provides the solutions to meet the requirements of industries of IoT such as cost, power, performance, and design. It can work as either a slave or a standalone application. If the ESP8266 Wi-Fi runs as a slave to a microcontroller host, then it can be used as a Wi-Fi adaptor to any type of microcontroller using UART or SPI. If the module is used as a standalone application, then it provides the functions of the microcontroller and Wi-Fi network. The ESP8266 Wi-Fi module is highly integrated with RF balun, power modules, RF transmitter and receiver, analog transmitter and

receiver, amplifiers, filters, digital baseband, power modules, external circuitry, and other necessary components

Block Diagram

To detect a flood the system observes various natural factors, which includes humidity, temperature, water level and flow level. To collect data of mentioned natural factors the system consist of different sensors which collects data for individual parameters. For detecting changes in humidity and temperature the system has a DHT11 Digital Temperature Humidity Sensor. It is a advanced sensor module with consists of resistive humidity and temperature detection components. The water level is always under observation by a float sensor, which works by opening and closing circuits (dry contacts) as water levels rise and fall. It normally rest in the closed position, meaning the circuit is incomplete and no electricity is passing through the wires yet. Once the water level drops below a predetermined point, the circuit completes itself and sends electricity through the completed circuit to trigger an alarm. The flow sensor on the system keeps eye on the flow of water.



Basic Model of the System

Working

Flood is a major known natural disaster that causes a huge amount of loss to the environment and living beings. So in these conditions, it is most crucial to get the emergency alerts of water level status at river beds in different conditions. In this project, the objective is to sense the water levels at river beds and check whether they are at a normal condition or not. If they reach beyond the limit, then it alerts the people through LED indications as well as through internet application. Here we are using an **ultrasonic sensor** to sense the river levels and a **NodeMCU ESP8266** to process these data. The data will be uploaded to ThingSpeak IoT cloud, using which the river levels can be graphically monitored from anywhere in the world.

Components Required

- ESP8266 NodeMCU
- Ultrasonic Sensor
- Power supply
- LEDs (Red & Green)
- Breadboard
- Jumpers

Implementation Steps

Step 1: Sign up for ThingSpeak

First, go to https://thingspeak.com/ and create a new free Mathworks account if you don't have a Mathworks account before.

Step 2: Sign in to ThingSpeak

Sign in to ThingSpeak using your credentials and click on "**New Channel**". Now fill up the details of the project like Name, Field names, etc. Here we have to create four field names such as Humidity, Temperature, pressure & Rain. Then click on "**Save channel**".

Step 3: Record the Credentials

Select the created channel and record the following credentials.

- Channel ID, which is at the top of the channel view.
- Write an API key, which can be found on the API Keys tab of your channel view.

Step 4: Add widgets to your GUI

Click on "**Add Widgets**" and add four appropriate widgets like gauges, numeric displays, and indicators. In my case, I have taken an Indicator for the flood. Select appropriate field names for each widget.

Software Implementation

Code:

```
// include the library code:
#include <LiquidCrystal.h>
#include <NewPing.h>
#include <stdlib.h>
const int trigPin = A4;
const int echoPin = A5;
long duration;
```

```
float distinCM, distinFT;
const int analogInPin = A0;  // Analog input pin that the  is attached.
float sensorValue = 0;        // value read from the
const int RELAY = 2;

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(9,8,7,6,5,4);//

#define SSID "1"              // "WiFi Name"
#define PASS "23456789"       // "Password"
#define IP "184.106.153.149"// thingspeak.com ip
String msg = "GET
/update?key=VDGTCBHBU067BR66;//9NFQF8RKJ8CWHBX2";
float temp;
String tempC;
int error;
int countt;

void setup()
{
 pinMode(RELAY, OUTPUT);
 digitalWrite(RELAY, LOW);
 pinMode(trigPin, OUTPUT);
 pinMode(echoPin, INPUT);
 // set up the LCD's number of columns and rows:
 lcd.begin(16, 2);
  // Print a message to the LCD.
 lcd.setCursor(0, 0);
 lcd.print("WELCOME VCK      ");
 lcd.setCursor(0, 1);
```

```
 lcd.print("Dept.of Electronics  ");
 delay(2500);
 lcd.setCursor(0, 0);
 lcd.print("Internet of Things");
 lcd.setCursor(0, 1);
 lcd.print("IoT Flood Monitor ");

 Serial.begin(115200); // use default 115200.
 Serial.println("AT");
 delay(2500);
 if(Serial.find("OK"))
 {
 connectWiFi();
 }
 lcd.clear();
}
void loop()
{
 start:
 error=0;
 lcd.setCursor(0, 0);
 lcd.print("Flood level=" );

  digitalWrite(trigPin, LOW);
 delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distinCM = duration*0.034/2;
```

```
  distinFT = distinCM/30;
  sensorValue = distinFT;
 lcd.print(sensorValue);
  lcd.setCursor(0, 1);
 if(sensorValue > 10)
 {
  lcd.print("Alert!!!!    " );
  digitalWrite(RELAY, HIGH);
 }
 else
 {
  lcd.print("Safe level   " );
  digitalWrite(RELAY, LOW);
 }
  countt++;
if(countt > 100)
{
  countt = 0;
  lcd.setCursor(15, 1);
  lcd.print("*" );
  updateTemp();
  lcd.setCursor(15, 1);
  lcd.print(" " );
  delay(500);          //Wait for 0.5 second
  lcd.clear();
}
 delay(100);
}
void updateTemp()
{
```

```
String cmd = "AT+CIPSTART=\"TCP\",\"";
cmd += IP;
cmd += "\",80";
Serial.println(cmd);
delay(2000);
if(Serial.find("Error")){
 return;
}
cmd = msg ;
cmd += "&field1=";
cmd += sensorValue;
cmd += "\r\n";
Serial.print("AT+CIPSEND=");
Serial.println(cmd.length());
if(Serial.find(">"))
{
 Serial.print(cmd);
}
else
{
 Serial.println("AT+CIPCLOSE");
 //Resend...
 error=1;
}
}
boolean connectWiFi()
{
Serial.println("AT+CWMODE=1");
delay(2000);
String cmd="AT+CWJAP=\"";
```

```
cmd+=SSID;
cmd+="\",\"";
cmd+=PASS;
cmd+="\"";
Serial.println(cmd);
delay(5000);

if(Serial.find("OK"))
{
 return true;
}else
{
 return false;
}
```

ADVANTAGES

- Early Warning: It can provide early warnings by monitoring water levels and whether conditions.
- Real _ Time data: IoT sensors can provide real time data, enabling accurate flood prediction and monitoring.
- Cost Effective : Automated monitoring can be cost effective
- Public Safety: Alerts can be sent to the public through various channels, ensuring people are well inform about potential flood events.
- Environmental Benefits: Improved Flood management can have positive environmental impacts by minimizing damage and pollution.

CONCLUSION AND FUTURE SCOPE

This project highlights the possibility to provide an alert system that will overcome the risk of flood. As the project is enabled with IoT technology and hence the sensor data can be monitored from anywhere in the world. More sensors can be integrated into the system in order to create more accurate and efficient flood detection system. It can also contribute to multiple government agencies or authorities that ultimately help the society and mankind about the flood like hazardous natural disaster. It will monitor each and every aspect that can lead to flood. If the water level rises along with the speed, it will send an alert immediately.

It also ensures increased accessibility in Vol-6 Issue-2 2020 IJARIIE-ISSN(O)-2395-4396 11894 www.ijariie.com 1655 dealing and reverting to this catastrophic incident. In summary, it will help the community in taking quick decisions and planning against this disaster mankind about the flood like hazardous natural disaster. The Future scope of the project is , flood can also be related to the intensity of rainfall, which is the height of the water layer covering the ground in a period of time.

Hence the development of a rainfall forecasting sensor eventually turn up to the early flood monitoring and detection, Scholarly studies are ongoing and can be implemented to our existing system in future.

REFERENCES

[1].Early Flood Monitoring System using IoT Applications S Vara Kumari, O Sailaja, N V S Rama Krishna, Ch Thrinisha

[2].Flood Monitoring and Detection System using Wireless Sensor Network, Edward N. Udo1, Etebong B. Isong2

[3].Sms based flood monitoring and early warning system , Sheikh Azid, Bibhya Sharma, Krishna Raghuwaiya, Abinendra Chand, Sumeet Prasad, A Jacquier

[4].Development of low cost community based real time flood monitoring and early warning system by Abimbola Atijosan, Ayodeji Olalekan Salau, Rahmon Ariyo Badru, Taofeek

[5].IOT based real time flood monitoring and alert management system by Jagadeesh Babu Mallisetty1 and Chandrasekhar V

[6].Automatic monitoring & Reporting of water quality by using WSN Technology and different routing methods.A.C.Khetre1, Prof.S.G.Hate2

[7].https://lastminuteengineers.com/water-level-sensor-arduino-tutorial/

[8].https://store.arduino.cc/usa/arduino-uno-rev3

[9].https://www.maxbotix.com/articles/how-ultrasonic-sensors-work.htm

[10].https://www.elprocus.com/a-memoir-on-water-flow-sensor/

[11].https://en.wikipedia.org/wiki/Internet_of_things

[12].https://www.adafruit.com/product/386

[13].https://en.wikipedia.org/wiki/ESP8266

[14] https://thingspeak.com

PROJECT WORK

ENTITLED

"ARDUINO BASED SALINE MONITORING SYSTEM"

SUBMITTED TO

DEPARTMENT OF ELECTRONICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

BY

Miss. ANANYA NETAJI JADHAV

Miss. DIPTI DILIP PATIL

Miss. SNEHAL BHIKAJI CHAVAN

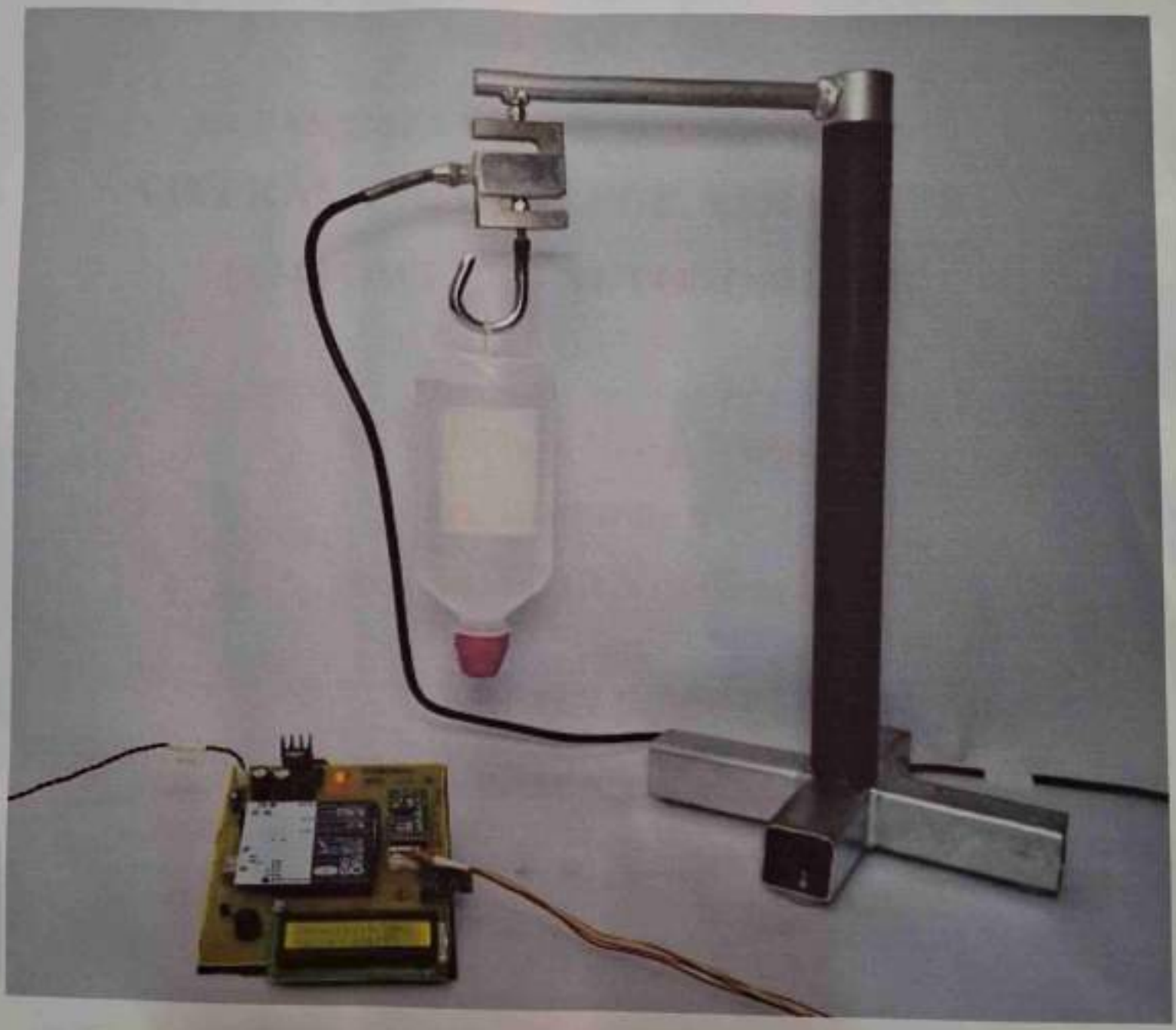
PROJECT GUIDE

Dr. M. S. PATIL

Mr. P. R. BAGADE

YEAR : 2023-24

AURDINO BASED SALINE MONITORING SYSTEM



PROJECT WORK

Entitled

"ARDUINO BASED SALINE MONITORING SYSTEM"

Submitted to

DEPARTMENT OF ELECTRONICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

By

Miss. Ananya Netaji Jadhav

Miss. Dipti Dilip Patil

Miss. Snehal Bhikaji Chavan

PROJECT GUIDE

Dr. M. S. Patil

Mr. P. R. Bagade

YEAR : **2023-24**

PROJECT WORK

Entitled

"ARDUINO BASED SALINE MONITORING SYSTEM"

Submitted to

DEPARTMENT OF ELECTRONICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

By

Miss. Ananya Netaji Jadhav

Miss. Dipti Dilip Patil

Miss. Snehal Bhikaji Chavan

PROJECT GUIDE

Dr. M. S. Patil

Mr. P. R. Bagade

YEAR : **2023-24**

Exam Seat No. :

Date :-

CERTIFICATE

VIVEKANAND COLLEGE, KOLHAPUR (EMPOWERED AUTONOMOUS)

Department of Electronics

This is to certify that Miss. Dipti Dilip Patil, Miss. Snehal Bhikaji Chavan and Miss. Ananya Netaji Jadhav students of B. Sc. III (Electronics) class has satisfactorily completed the project entitled " Arduino Based Saline Monitoring System" as a partial fulfilment of Electronics practical examination conducted by the college during the year 2023-24.

Teacher in charge

Examiner

Head of Department

(Dr. C. B. Patil)

HEAD
DEPARTMENT OF ELECTRONICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

ACKNOWLEDGEMENTS

We got this opportunity and thank all the individuals connected with this project for their useful direction, help and timely support which helped us to complete the project in specific time. We would really want to express great gratitude to our Head of Department Dr. C. B. Patil and our project guide Dr. Milind Patil for their all-important support, motivation, guidance and helpful suggestions all into the project work.

Also we express our sincere thanks to Mr. P. R. Bagade, Mr. N. P. Mote, Dr.P. S. Jadhav and Mr. G. B. Jirage for their moral support and helpful suggestions during our project work. We also thakfull to Mr.Rohit Nigave and Mr.M.D.Jangam for their valuable direction and constant support.

Lastly but not least our sincere credit goes to our family for their key support since we begin our education and also to our group members.

By:-

Miss. Ananya Netaji Jadhav

Miss. Dipti Dilip Patil

Miss. Snehal Bhikaji Chavan

INDEX

Chapter:-1

1.1 Introduction

Whenever a patient is given too much salt, they need regular monitoring by a nurse and any relative. Often due to negligence, busy time, and the additional number of patients, the nurse may forget to change the saline bottle as soon as it is completely consumed. Shortly after the salt diplets, the blood rushes back to the salt bottle due to the difference in blood pressure and pressure inside the empty salt bottle. This can cause blood to flow that distorts the salt bottles from their veins. This results in a decrease in haemoglobin levels in patients and may also lead to a deficiency of red blood cells (RBCs) in the patient's blood causing fatigue. Therefore, there is a need to develop a saline monitoring system that will reduce patient dependence on nurses or caregivers to some degree. In the proposed system salt is automatically detected using Arduino.

We use many hardware tools connected to the Arduino UNO Board Hardware devices include - Load cell, HX711, buzzer, etc. The lack of care persons with sufficient skill in hospitals and their heavy duty become a social problem in the modern world. We should develop low cost health monitoring systems available to every hospital in the days to come. Various engineering designs are carried for the benefit of hospital facility enhancement. A number of health monitoring sensors for humans in bed have been developed. Monitoring heart rate by an air pressure with an air tube in mattress in bed is also developed. System of systems using non- contact sensors is described by Yutaka HATA.

1.2 Need of Project

The most well-known effect of saline fluid is that it increases the patient's body temperature and heart rate. Saline monitoring and alert systems ensure precise and safe administration of saline fluids, preventing under or over-infusion, enhancing patient safety and treatment efficacy.

1.3 Objective

The objectives of an Arduino-based saline monitoring system project typically revolve around ensuring the accurate and reliable measurement of saline levels in a medical applications.

Here are some common objectives:

Accurate Monitoring: Develop a system capable of accurately measuring and monitoring saline levels in real-time to ensure proper saline administration and prevent under or over-dosing.

Reliability: Create a reliable system that can operate continuously without frequent maintenance or calibration, ensuring consistent performance over time.

Cost-effectiveness: Design a solution that is cost-effective, using readily available components such as Arduino boards and sensors to keep production and maintenance costs low.

User-friendly Interface: Implement a user-friendly interface for easy interaction with the monitoring system, allowing healthcare professionals or operators to easily view and interpret saline level data.

Alarm System: Incorporate an alarm or notification system to alert users in case of abnormal saline levels, helping to prevent potential medical errors or equipment malfunctions.

Chapter 2: System Review

2.1 Block Diagram:-

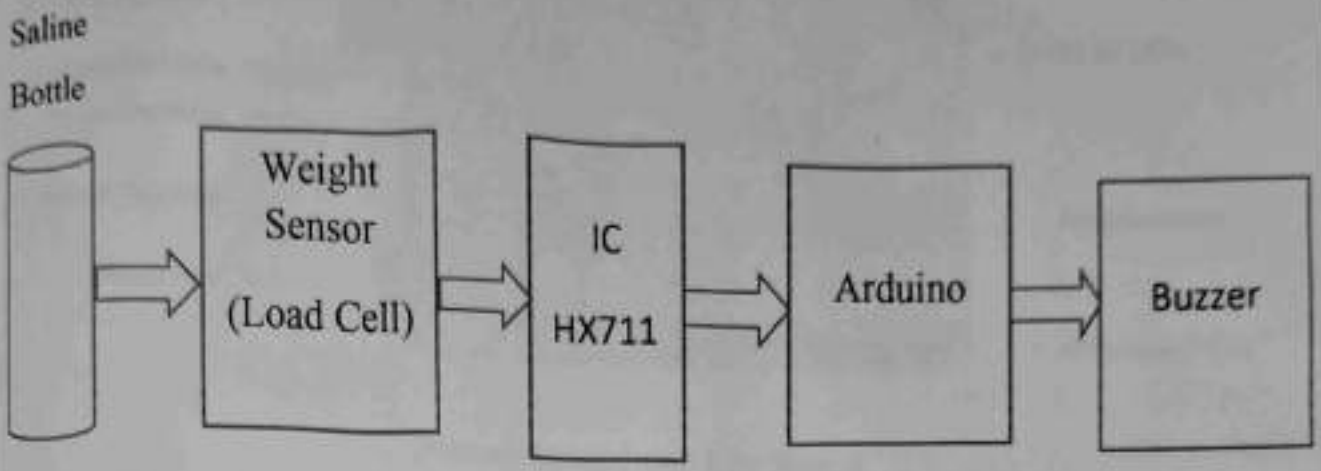


Figure 1: Block Diagram of Arduino Based Saline Monitoring System

2.2 Block Diagram Description:-

The Block diagram of Arduino Based Saline Monitoring System is as shown in figure 1. The saline bottle is connected to the load cell for measure the weight of saline bottle. A load cell is a transducer that is used to create an electrical signal whose magnitude is directly proportional to the force being measured. HX711 is a precision 24-bit analog to-digital converter (ADC) designed for weigh scales and industrial control applications to interface directly with a bridge sensor. Arduino is a small microcontroller board with a USB plug to connect to the computer, which is used to continuous monitor the weigh to saline bottle, if the weight of saline bottle come down to threshold weight, it create the alarm using buzzer.

2.3 Hardware Components Description

Required Components to build an Arduino based Saline monitoring system are Arduino Uno, Load cell (3kg), HX711 Load cell Amplifier Module, Buzzer and connecting wires.

2.3.1 Arduino UNO

Picture 1: Arduino Uno Board

The Arduino Uno is a popular microcontroller board based on the ATmega328P microcontroller chip. Here's some information about it:

Microcontroller: The heart of Arduino Uno is the ATmega328P microcontroller chip, which is clocked at 16 MHz. It has 32 KB of flash memory for storing your programs (of which 0.5 KB is used for the bootloader), 2 KB of SRAM, and 1 KB of EEPROM.

Digital and Analog I/O: The Uno has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header, and a reset button. It can be powered either via USB connection or an external power supply.

Programming: The Uno can be programmed using the Arduino Software (IDE), which is a cross-platform application that runs on Windows, macOS, and Linux. It uses a simplified version of C++ to write programs for interacting with the hardware.

Compatibility: Arduino Uno is widely used and supported in the maker community, with a vast array of libraries and examples available. It's compatible with a wide range

of sensors, actuators, shields, and other add-on modules, making it versatile for various projects.

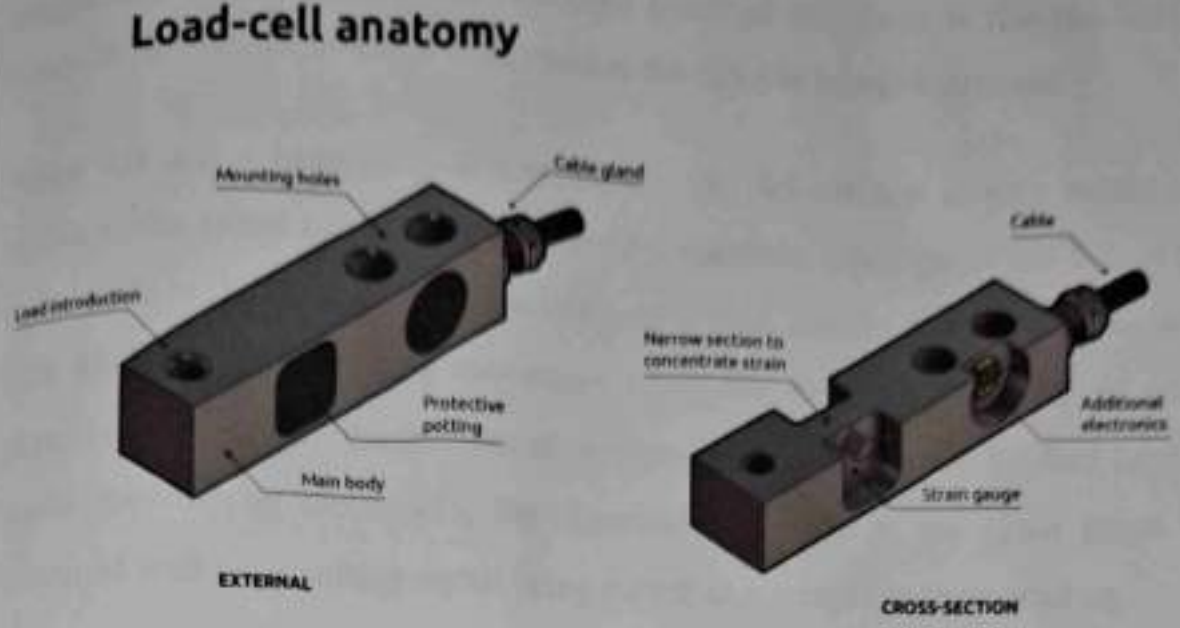
Open Source: Arduino Uno, like other Arduino boards, is open-source hardware. This means the designs of the board are freely available for anyone to examine, modify, and distribute under the terms of the Creative Commons Attribution Share-Alike license.

Community and Resources: There's a large and active community around Arduino, with forums, tutorials, and guides available online. This community support can be helpful for beginners as well as experienced users who may encounter challenges or need inspiration for their projects.

Expansion: One of the significant advantages of Arduino Uno is its compatibility with a wide range of shields – add-on boards that can extend its capabilities. Shields are available for Ethernet, WiFi, Bluetooth, motor control, LCD displays, and more, making it easy to add functionality to your projects without much soldering or wiring.

Arduino Uno is often recommended as an excellent starting point for beginners due to its simplicity, ease of use, and extensive documentation and community support. It's also capable enough to be used in more advanced projects by experienced makers and professionals.

2.3.2 Weight Sensor (Load Cell)



Picture 2: Load Cell

A load cell is an electro-mechanical sensor used to measure force or weight. It has a simple yet effective design which relies upon the well-known transference between an applied force, material deformation and the flow of electricity. They are incredibly versatile devices that offer accurate and robust performance across a diverse range of applications. It's no surprise that they have become essential to many industrial and commercial processes, from automating car manufacturing to weighing your shopping at the checkout. As technology explodes forward, many new and exciting applications are emerging that also stand to benefit from using load cells. New advances in robotics, haptic and medical prostheses, to name a few, all need effective ways to measure forces and weights. New types of load cells are continuously being designed to meet the needs of this ever-changing market.

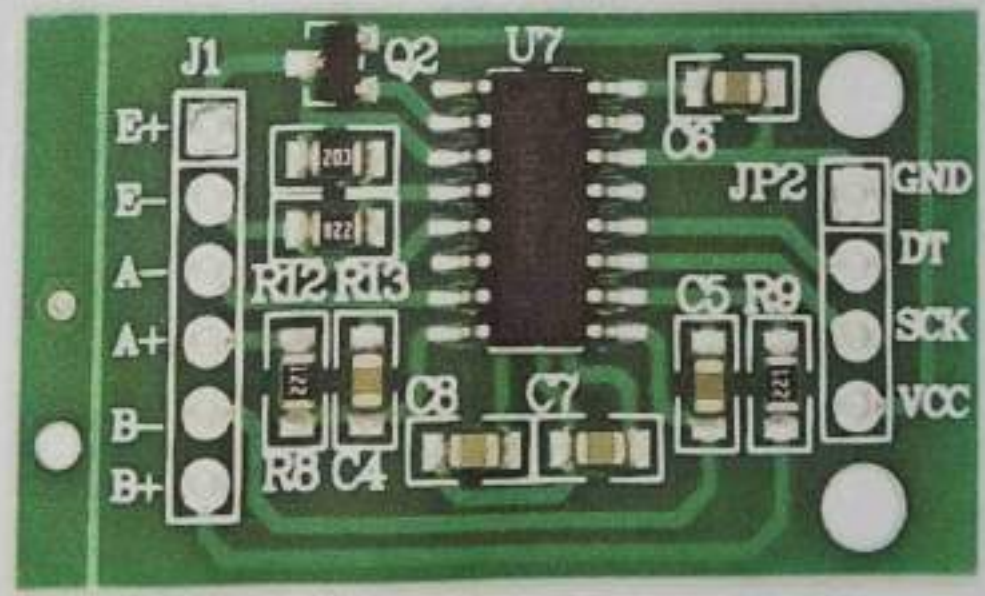
When we use load cells, one end is usually secured to a frame or base, while the other end is free to attach the weight or weight-bearing element. When force is applied to the body of the load cell, it flexes slightly under the strain. This is similar to what happens to a fishing rod when a fisherman hooks a fish.

The fisherman will secure the rod in their hands while the fish applies a pulling force on the other end of the fishing line. The result of this force is that the fishing rod bends, with a bigger, stronger fish, causing the bend to be more extreme.

When this action happens to a load sensor, the deformation is very subtle and not visible to the naked eye. To measure the deformation, strain gages are tightly bonded to the body of the load cell at pre-determined points, causing them to deform in unison with the body. The resulting movement alters the electrical resistance of the strain gages in proportion to the amount of deformation caused by the applied load. Using signal conditioning electronics, the electrical resistance of the strain gages can be measured with the resulting signal being output as a weight or force reading.

A typical load cell consists of two parts: the main body and an attached electrical circuit. The main body is what bears the weight or force and accounts for most of the load cell's size. Typically, it is made from high-grade steel or aluminium, which ensures mechanical reliability, and predictable and uniform strain distribution

2.3.3 Hx711:-



Picture 3: IC HX 711

The HX711 is a precision 24-bit analog-to-digital converter (ADC) that is designed for weighing scales and industrial control applications to interface directly

with a bridge sensor. It is specially made for amplifying signals from cells and reporting them to another microcontroller.

HX711 is an electronic scale module, whose working principle is to convert the measured changes in resistance value changes, through the conversion circuit into electrical output. The module communicates with the host computer through TTL RS232.

The dual-channel 24 Bit Precision A/D weight Pressure Sensor Load Cell Amplifier and ADC HX711 Module is a small breakout board; for the HX711 IC that allows you to easily read load cells to measure weight. By connecting the module to your microcontroller you will be able to read the changes in the resistance of the load cell; and with some calibration. You'll be able to get very accurate weight measurements. This can be handy for creating your own industrial scale, process control, or simple presence detection. The HX711 Weighing Sensor uses a two-wire interface (Clock and Data) for communication. Any microcontroller's GPIO pins should work and numerous libraries have been written making it easy to read data from the HX711.

2.3.4 Buzzer:-

Picture 4 : Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, train and confirmation of user input such as a mouse click or keystroke. When a voltage is applied across the two electrodes, the

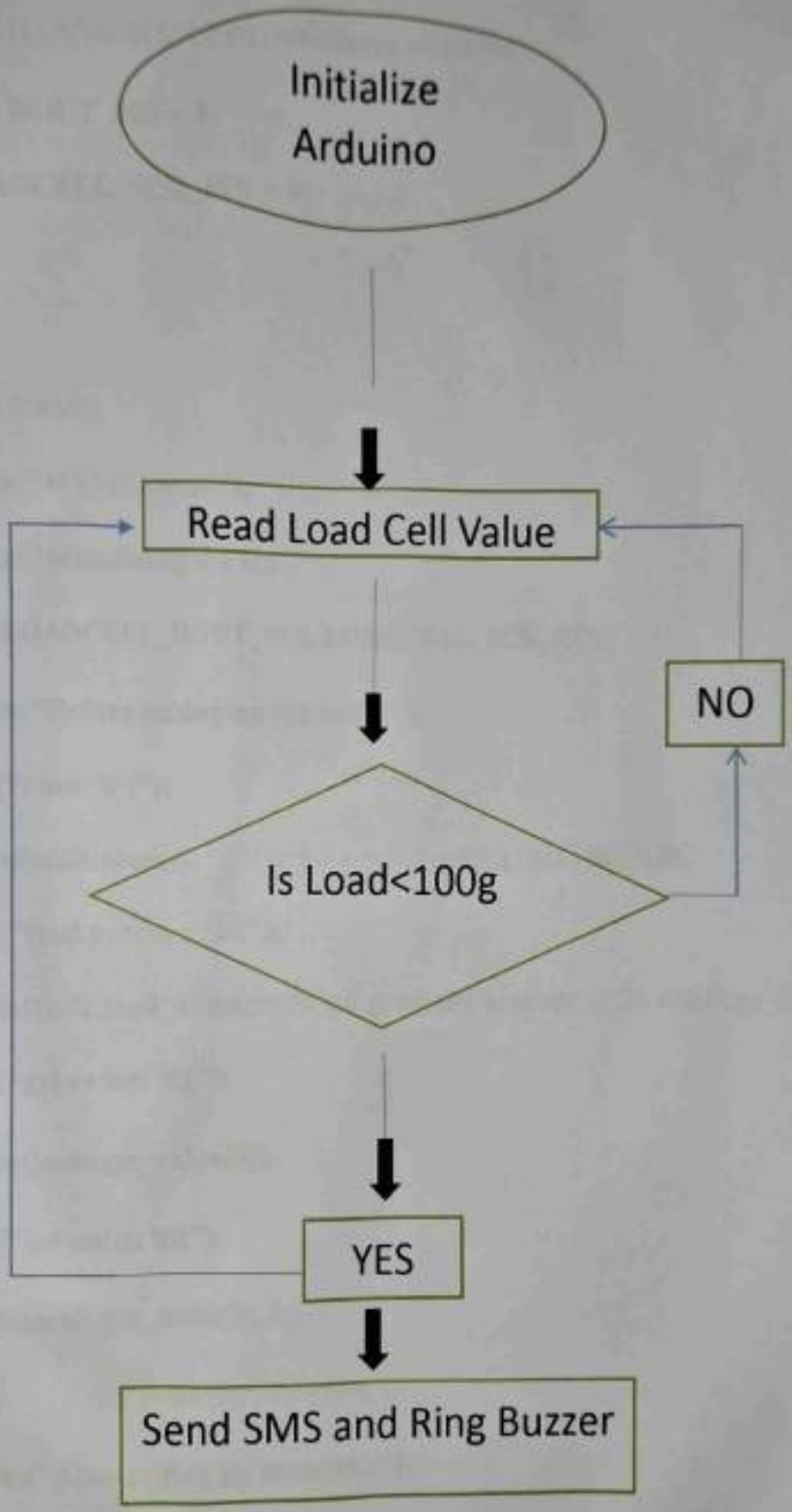
piezoelectric material mechanically deforms due to the applied voltage. This movement of the piezo disk within the buzzer creates sound in a similar manner as the movement of the ferromagnetic disk in a magnetic buzzer or the speaker cone mentioned above.Magnetic buzzers operate at lower voltages and higher currents (1.5–12 V, > 20 mA) compared to piezo buzzers (12–220 V, < 20 mA), while piezo buzzers often have greater maximum sound pressure level (SPL) capability than magnetic buzzers.

The buzzer is a sounding device that can convert audio signals into sound signals. It is usually powered by DC voltage. It is widely used in alarms, computers, printers and other electronic products as sound devices. It is mainly divided into piezoelectric buzzer and electromagnetic buzzer, represented by the letter "H" or "HA" in the circuit. According to different designs and uses, the buzzer can emit various sounds such as music, siren, buzzer, alarm, and electric bell.

The piezoelectric buzzer uses the piezoelectric effect of the piezoelectric ceramics and uses the pulse current to drive the vibration of the metal plate to generate sound. Piezoelectric buzzer is mainly composed of multi-resonator, piezoelectric plate, impedance matcher, resonance box, housing, etc.

Chapter 3: Software Design & Implementation

3.1 Flow Chart

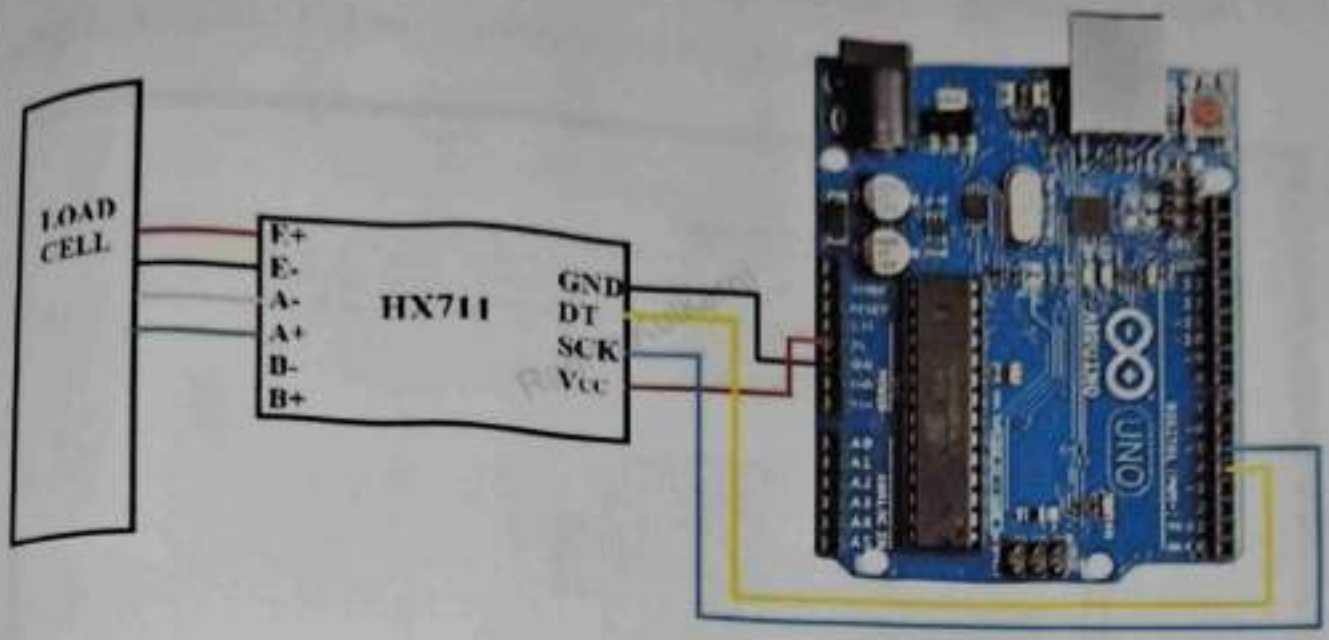


3.2 Programme

```
#include <Arduino. h>

#include "HX711.h"  // HX711 circuit wiring const int

LOADCELL_DOUT_PIN = 2;

const int LOADCELL_SCK_PIN = 3;

HX711 scale;

void setup() {

 Serial.begin(57600);

 Serial.println("HX711 Demo");

 Serial.println("Initializing the scale");

 scale.begin (LOADCELL_DOUT_PIN, LOADCELL_SCK_PIN);

 Serial.println("Before setting up the scale:");

 Serial.print("read: \t\t");

 Serial.println(scale.read());      // print a raw reading from the ADC

 Serial.print("read average: \t\t");

 Serial.println(scale.read_average(20));// print the average of 20 readings from the ADC

 Serial.print("get value: \t\t");

 Serial.println(scale.get_value(5));

 Serial.print("get units: \t\t");

 Serial.println(scale.get_units(5), 1);

 scale.tare();              // reset the scale to 0

 Serial.println("After setting up the scale:");
```

```
Serial.print("read: \t\t");
Serial.println(scale.read());                 // print a raw reading from the ADC
Serial.print("read average: \t\t");
Serial.println(scale.read_average(20));// print the average of 20 readings from the ADC
Serial.print("get value: \t\t");
Serial.println(scale.get_value(5));
Serial.print("get units: \t\t");
Serial.println(scale.get_units(5), 1);
Serial.println("Readings:");
}
void loop() {
Serial.print("one reading:\t");
Serial.print(scale.get_units (), 1);
if (scale.get_units() > 30)
{
Serial.print(" high wt.");
}
else
{
 Serial.print(" lower wt.");
}
 Serial.print("\t| average:\t");
Serial.println(scale.get_units(10), 5);
delay (5000);
}
```

3.3 System Implementation



1] Load Cell has 4 wires:

Red: E+

Black: E-

White: A-

Green: A+

2] Connect load cell to HX711 and HX711 to Arduino as shown in the above figure. Then connect the USB cable between Arduino and Computer.

3] Open Arduino Software and install HX711 libraries.

4] Calibrating the load cell is the most complex task in the complete operation. Here, I will share a simple method to calibrate the load cell which will work on every load cell and give the most precise and accurate output.

5] After downloading all the libraries, run the below code on Arduino Software:

Working:-

We designed and developed the entire idea into a device, where we integrate all the mentioned components into a single unit. Different wires in Load cell: Excitation+ (E+) or VCC is red, Excitation-(E-) or ground is black, Output+ (O+), Signal+ (S+) + or Amplifier+ (A+) is white, Output-(O-), Signal- (S) + or Amplifier-

(A-) is green. HX711 is connected to Arduino Uno through VCC to 5V, GND of HX711 to GND of Arduino, SCK of HX711 to D5 of Arduino, and DT of HX711 to D6 of Arduino. Load Cell is connected to HX711 through E+: RED, E: BLACK, A- : WHITE, A+: GREEN. Entire Connection is shown below in Fig.

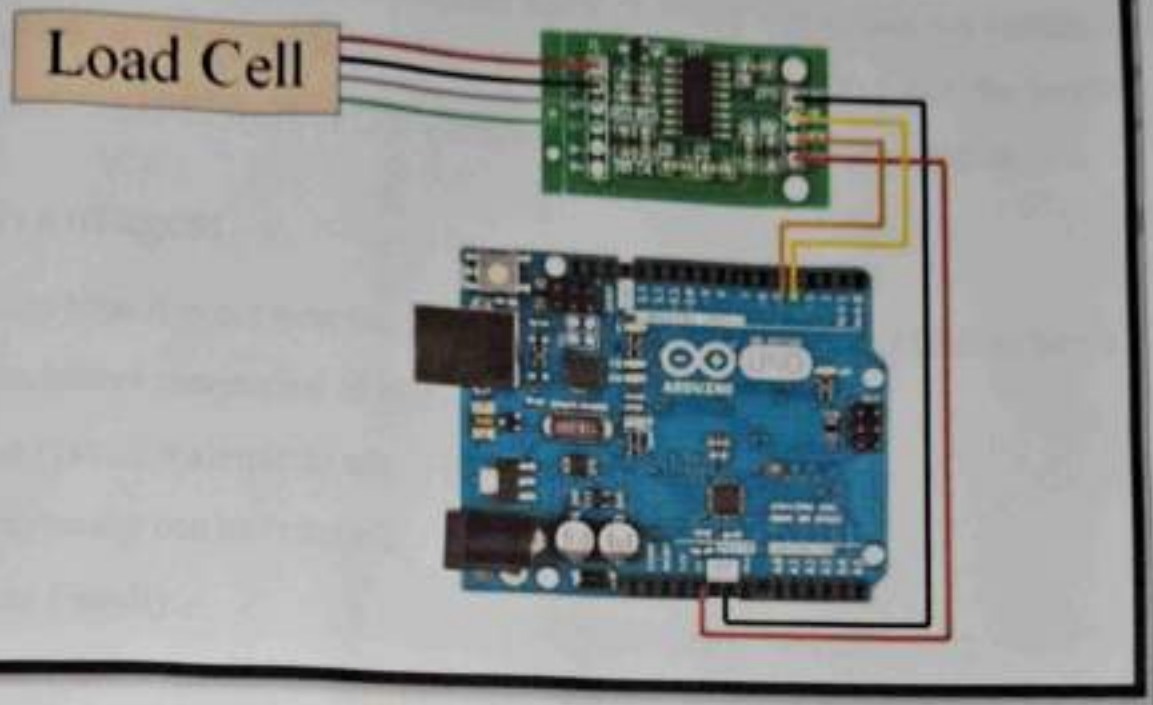


Fig. Connection of HX711 to Arduino UNO and load cell to HX711.

All the components are connected as shown in the block diagram Fig . Initially, we connect the load cell to the Arduino through the HX711 module. HX711 module is useful in detecting the loads that are placed on the load cell. The saline bottle is hanged to the load cell using a hook. Load cell detects the weight of the Saline bottle. We initially set some particular threshold in the code written. If the weight of the Saline bottle reaches the threshold, our system sends Alert Notification to the hospital management. In the Alert Notification sent we can see the current level of the Saline bottle.

Chapter 4: Result and Discussion

4.1 Result:

The weight of the saline bottle indirectly indicates the amount of saline present in it. Three levels (HIGH and LOW) are fixed to indicate the level of the saline present in the bottle. When the weight of the saline bottle is above 500 g then the condition is considered HIGH. When the level of the saline bottle is below 200 g then the condition is considered as LOW. As the LOW condition is executed, then alarm is executed.

4.2 Advantages:

- Every time it is not necessary to watch a patient who is injected Saline bottle.
- Continuous monitoring of bottle is not required.
- The system is simple to use.
- Man power can be reduced.
- User friendly.
- This system is reliable .
- No safety requirements is been needed as our system is purely software oriented

4.3 Disadvantages:

- High Cost
- Unable to send intimation to long distance

Chapter: - 5

5.1 Future Scope:

- Wireless monitoring: The system can monitor remotely for patient care.
- Integration with other medical devices: The system can integrate with other medical devices.
- User-friendly interfaces: The system can have user-friendly interfaces for ease of use.
- Smart health system: The system can include a smart health system that provides information about body temperature.
- Remote monitoring: The system can remotely monitor the patient's electrolyte bottle level.
- Automatic alert system: The system can have an automatic alert system to protect patients and provide safety during saline feeding hours.
- Sensor-based system: The system can have a sensor to monitor the critical level of the saline liquid in the saline bottle.
- Automatic flow stop: The system can have a mechanism that automatically stops the saline flow after the saline bottle is completely empty.
- Cloud platform: The system can access data through a cloud platform using ThingSpeak.

5.2 Conclusion:-

The system is very helpful at night as there will be no need to constantly monitor the level of saline by people. Patients can be hired in real time without the need for regular visits from doctors or nurses. As patients are monitored further, the chances of a blood loss or controlled and the patient's life is not envolved because of any negligence.

Chapter: - 6

References

1. E S. Tawade, M.S. Pendse, H.P. Chaudhari "Design and Development of Saline Flow Rate Monitoring System Using Flow Sensor, Microcontroller and RF ZigBee Module" International Journal of Engineering Research and General Science (IJERGS) Volume 3, Issue 3.
2. Thongpance, Nuntachai, Yuttana Pititeeraphab, and Matida Ophasphanichayakul. "The design and construction of infusion pump calibrator." Biomedical Engineering International Conference (BMEiCON), 2012.IEEE, 2012.
3. Ashika A. Dharmale1, Revati R. Mehare, Ankita R. Bharti,Shweta R.Meshram, Prof. Swapnil V. Deshmukh International Journal of Advanced Research in Computer and Communication Engineering Vol.8, Issue4, April 2019 IOT Based Saline Level Monitoring &Automatic Alert System.
4. Khushboo Vaishnav, Neha Swamy, Nargees Bano Haidarali, Prof.Madhuri Patil , IoT Based Saline Level Monitoring System, International Journal of Innovations & Advancement in Computer Science IJIACS ISSN 2347 – 8616 Volume 6, Issue 10 October 2017.
5. Anusha Jagannathachari, Archana Rajan Nair, Saline Level Indicator, IOSR Journal of Computer Engineering (IOSRJCE) e-ISSN: 2278-0661,p-ISSN: 2278-8727 PP 13-16 www.iosrjournals.org
6. B. Naga Malleswari, P. Vijay Varma, Dr. N. Venkataram, Smart saline level monitoring system using IOT, International Journal of Engineering &Technology, 7 (2.7) (2018) 817-819 International Journal of Engineering & Techn.

PROJECT WORK

" VOICE CONTROLLED HOME AUTOMATION "

SUBMITTED TO

DEPARTMENT OF ELECTRONICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

BY

Mr. ROHIT A. CHOUGULE
Mr. SOURAV S. GADKARI
Mr. SAMIR B. PENDHARI

PROJECT GUIDE

Dr. M. S. PATIL
Mr. N. P. MOTE

YEAR : 2023-24

PROJECT WORK

" VOICE CONTROLLED HOME AUTOMATION "

Submitted to

Department of Electronics

Vivekanand College, Kolhapur
(Empowered Autonomous)

By

Mr. Rohit A. Chougule

Mr. Sourav S. Gadkari

Mr. Samir B. Pendhari

PROJECT GUIDE

Dr. M. S. Patil
Mr. N. P. Mote

Year: 2023-24

Exam Seat No:

Date:-

CERTIFICATE

DEPARTMENT OF ELECTRONICS

This is to certify that Mr. Rohit A. Chougule, Mr. Sourav S. Gadkari and Mr. Samir B. Pendhari students of B.Sc III (Electronics) class has satisfactorily completed the project entitled "Voice- controlled home automation using Arduino" as a partial fulfillment of Electronics practical examination conducted by the college during the year 2023-24.

Teacher In charge

Examiner

Head of Department

HEAD
DEPARTMENT OF ELECTRONICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

ACKNOWLEDGEMENT

We are grateful for this chance and to everyone involved in the project for their helpful guidance, assistance, and promptsupport, all of which enabled us to finish the job on schedule.We would truly like to thank our Department head, Dr. C. B. Patil, and our project manager, Mr. N. P. Mote, Mr. P. R. Bagade, Dr. P. S. Jadhav, Dr. M. S. Patil and Mr. G. B. Jirage, Mr. Rohit Nigave and Mr. M. D. Jangam for their valuable time throughout the project. Last but not least, we would like to sincerely thank our group member and family for their invaluable support from the start of our schooling.

INDEX

INTRODUCTION

Voice-controlled home automation using Arduino is a project that combines hardware and software to enable you to controlappliances, lighting, and other home systems simply by speaking voice commands. The heart of this system is an Arduino board, typically the Arduino Uno, along with a voice recognition module or sensor. The project involves programming the Arduino to listen for specific voice commands and actuate corresponding devices or tasks.

Wireless Voice-Controlled Automation of the Home Based on Bluetooth, and Wi-Fi, this project integrates a mobile phone (application) with an integrated system to provide the elderly and disabled with the ability to fully control their home utilities using voice commands on their phone. The non-technical individual willfind it easy to carry, install, configure, run, and maintain this device due to its design. Connecting specific electrical equipment that are used in a home is known as home automation.

HARDWARE COMPONENTS

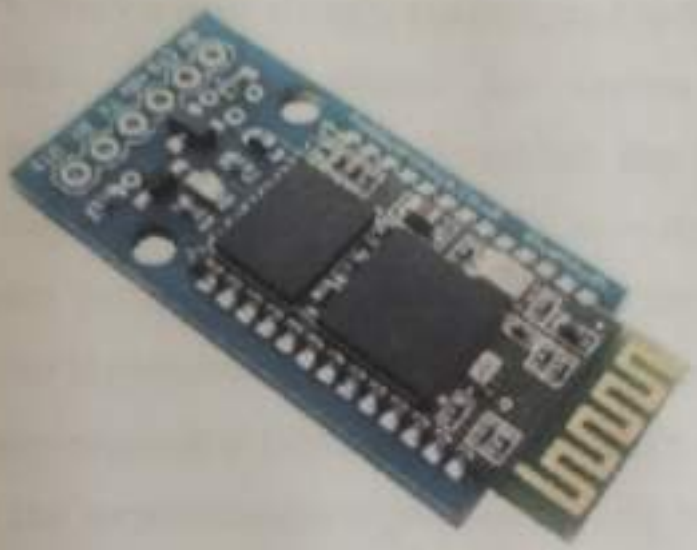
If we consider the hardware requirements for our project, the following are the primary hardware tools that we are using to construct the voice-controlled home utilities via Android phone.

Arduino Uno:

We are utilizing an Arduino Uno, which is a circuit board with an ATmega328 built right in. It features six analog pins, a USBconnection connector, a power jack, a reset button, and 14 digitalinput/output pins, six of which can be used as PWM output pins. This microcontroller is extremely simple and basic for demonstration purposes. The Board can be powered by abattery, an AC-to-DC adapter, or a USB cable that is plugged intoa computer. One of this microcontroller's other finest qualities is that its CPU has a significant amount of RAM, ROM, and other components.

Bluetooth Module:

The Bluetooth module (HC-05), sometimes referred to as the slave module, is another important part to consider. It is utilized to connect the Arduino Uno and Android phone. The voltage that the Bluetooth module requires is 3.3. The primary reasons for its selection are its low voltage consumption and compatibility with microcontrollers that operate at verylow voltages.



Relays Module:

We have equipped the Arduino Uno with a relays module to regulate its voltage and power. This module uses its electromagnetic behavior to detect current to control and prevent high voltage.

Since the focus of this project is using a mobile application to regulate household utilities, light bulbs and portable fans are among the utilities we are taking into consideration. Thus, this is another crucial

criteria for our project that must be met in order to support these utilities for the real-world demonstration. We have additionally added flame- and acid-resistant block connectors to it.

In order to achieve the final goals and objectives, all of the components must be developed and integrated in a real-time situation during this phase of the lifecycle.

This is where the majority of the practical approach is applied. At this point, every earlier design, analysis, and coding step is applied to the scenario. Here, we outline the various functionalities we implemented step- by-step to accomplish the final result in each module together with their outputs. We have determined that this is the primary portion of the project since it is the most important and requires our highest level of attention.

We have separated this phase into distinct sections in order to prepare the implementation process for our voice-activated home automation project, given its significance.

Components Needed

We required different tools to assemble and different componentsto combine for the project.

We used the following tools and components

- ✓ Connecting Wire
- ✓ Jumper
- ✓ Breadboard - Prototyping board
- ✓ Arduino Uno
- ✓ Bluetooth module -05 Bluetooth Module
- ✓ Pliers
- ✓ 9v Battery

WORKING PRINCIPLE

1. To control four devices using Arduino code, eight different voice commands are needed.
2. Two specific commands are used: "turn on light" to turn on the light and "turn off light" to turn it off.
3. The list of voice commands includes: "turn on light", "turn off light", "turn on fan", "turn on TV", "turn on pump", "turn off all", and "turn off all".
4. When a voice command is sent through the app, the Bluetooth module receives the command and compares it with the predefined commands in the Arduino code. If the command matches, the Arduino sends a command to operate the relay module, which displays the device's status on the 16x2 LCD display module.

Working

Components Needed

- ✓ Fan
- ✓ Light
- ✓ Heater (I used light as to demonstrate)

Functionality

Given that the goal of this endeavor is to assist the underprivilegedand aged, altering their way of life on a daily basis. Turning on or off thelights and, most likely, the fan in a room can be done without having to goto the switchboard. All someone needs is a smartphone with voice and internet connectivity.

When the user turns on the phone, launches the developed application, and says, "Light on," the lights turn on; alternatively, he may say, "Lights off," in which case the lights turn off. This is how we can use voice commands to operate the household utilities.

Wiring and Circuited

First, we'll connect the Bluetooth module to the Arduino Uno (you can also use the Ethernet Shield for this demonstration, but we're using the Bluetooth module HC-06). Since Bluetooth uses the Universal Asynchronous Receiver-Transmitter (UART) Protocol, we're using the Arduino Uno microcontroller board's RX and TX pins. Pins 2 and 3 are typically designated as RX and TX pins, respectively.

It is possible that the Arduino Uno won't accept 3.3V in the middleof the process. In that case, we will need to convert 3.3V to 5V, althoughthis is a rare occurrence; in most cases, the system can handle 3.3V.Connecting the relay board to the Arduino UNO will be our next task.Now that we are

using a pre-made, four-channel relay board (which mayalso be manual), it is time to connect the Arduino Uno to each relay's input.

It is now necessary for us to connect the Arduino Uno to the household utilities. The pins numbered one through nine indicate which ends of the 5v or 12v utilities the component should be connected to, and one end of the pins will be linked to ground (GND) from the Arduino to the components. The RXD and TXD pins (P3.0 and P3.1) of the microcontroller are linked to the TX and RX Pins of the Bluetooth module. Pin 20 is connected to ground, and Pin 40 is connected to +5V for the GND pin. Note: When connecting the AC adapter to the relay board, the user should exercise particular caution.

When utilizing three components, electrical components such as fans or lamps must be connected to the P0.0 to P0.3 pins via a four-channel relay board. NPN transistors are required to power the relay boards, which will consume very little DC voltage to drive AC loads (sometimes the relay board is already incorporated in the Arduino module itself, it varies from board to board).

Assembling Arduino and home utilities

We now need to talk about how the household appliances and Arduino Uno are put together. We used a 12v or 5v relay board to manage the high voltage utilities.

Software Implementation

Program Code

```
#include <Arduino.h>
#include "HX711.h"

// HX711 circuit wiring
int Buzzer = 9; // connect ir sensor to arduino pin 9
const int LOADCELL_DOUT_PIN = 2;
const int LOADCELL_SCK_PIN = 3;
HX711 scale;
void setup()
{
 pinMode (Buzzer, OUTPUT); // Led pin OUTPUT
 Serial.begin(57600);
 Serial.println("HX711 Demo");
 Serial.println("Initializing the scale");

 scale.begin(LOADCELL_DOUT_PIN, LOADCELL_SCK_PIN);

 Serial.println("Before setting up the scale:");
 Serial.print("read: \t\t");
 Serial.println(scale.read());     // print a raw reading from the ADC

 Serial.print("read average: \t\t");
 Serial.println(scale.read_average(20));   // print the average of 20 readings from the
ADC

 Serial.print("get value: \t\t");
 Serial.println(scale.get_value(5));   // print the average of 5 readings from the ADC
```

```
minus the tare weight (not set yet)

 Serial.print("get units: \t\t");
 Serial.println(scale.get_units(5), 1);  // print the average of 5 readings from the ADC
minus tare weight (not set) divided
        // by the SCALE parameter (not set yet)

 scale.set_scale(-640.752);
 //scale.set_scale(-471.497);                  // this value is obtained by calibrating the
scale with known weights; see the README for details
 scale.tare();               // reset the scale to 0

 Serial.println("After setting up the scale:");

 Serial.print("read: \t\t");
 Serial.println(scale.read());                 // print a raw reading from the ADC

 Serial.print("read average: \t\t");
 Serial.println(scale.read_average(20));      // print the average of 20 readings from
the ADC

 Serial.print("get value: \t\t");
 Serial.println(scale.get_value(5));  // print the average of 5 readings from the ADC
minus the tare weight, set with tare()

 Serial.print("get units: \t\t");
 Serial.println(scale.get_units(5), 1);       // print the average of 5 readings from the
ADC minus tare weight, divided
        // by the SCALE parameter set with set_scale
 Serial.println("Readings:");
}
```

```
void loop() {
 Serial.print("one reading:\t");
 Serial.print(scale.get_units(), 1);
 Serial.print("\t| average:\t");
 Serial.println(scale.get_units(10), 5);
 if(scale.get_units() < 130)
 {
 Serial.print("\t| Low  wt. :\t");
 digitalWrite(Buzzer, HIGH); // LED LOW
   //tone(Buzzer,450);
    delay(1000);
    delay(1000);
    digitalWrite(Buzzer, LOW); // LED LOW
    delay(1000);
 }
 else
 {
 Serial.print("\t| Normal wt. :\t");
   }
  delay(5000);
}
```

APPLICATION

- Using a smartphone, this project will enable users to remotely turn on andoff appliances from a distance without getting up from their seat.
- We can link this feature to the internet so that users at a distance can alsocontrol it, although there may be additional security risks in doing so.
- The monitoring of elderly and disabled people's safety can also be accomplished with this initiative.
- Additional sensors, such as sound and safety sensors, can be used to expand this project. These sensors can also be used to regulate room temperature and possibly even light intensity during the day and night.

ADVANTAGES

1. Seamlessness and Convenience

With everyone's schedules so hectic and demanding, they all want their homes to have a calming and cozy atmosphere when they arrive.Consequently, picture living in a house where you may utilize voice commands on Google Assistant or Amazon Alexa, or simply tap the associated device to operate every smart appliance in the house. Voice Control commands contribute to unparalleled seamlessness and ease, resulting in faster and simpler completion of routine tasks. Once the Home Mate smart lights, fans, touch switches, and much more are installed, you may use the voice-activated assistant to change the frequency and speedofthe Home Mate devices.

2. Accessibility and Inclusivity

Home Mate's Voice Control technology is revolutionizing accessibility and inclusion in smart homes. Traditional interfaces like touchscreens or physical switches can be quite difficult for those with impairments or restricted movement. These obstacles are removed with the voice feature, making it simple for every member of the family to communicate with thesmart home.

3. Enhanced Energy Efficiency

Voice Control with Home Mate offers a number of benefits, one of which is improved energy efficiency. Smart houses are already made to control lighting, heating, and cooling, among other systems, in an intelligentmanner to maximize energy efficiency.

Voice control integration gives homeowners the power to adjust and customize how much energy they use. Additionally, Home Mate can offer statistics on energy consumption in real time and make recommendations for waste reduction, which will ultimately result in lower utility costs and a greener home.

4. Improved Home Security System

The provision of home security is the main goal of the home automation system. Furthermore, every homeowner should prioritize installing a home security camera. An additional degree of comfort and confidence is provided by the availability of voice feature instructions. Even while you're resting in bed or are far away, you can still operate and manage your household appliances. Furthermore, you can easily monitor and control security devices using the voice-activated assistant feature.You may view a live view video feed from your front door camera on a connected device by just telling your Google Assistant or Amazon Alexa to "show me the front door camera."

5. Personalized Smart Home Experience

The voice control feature of Home Mate helps elevate the level ofpersonalization available for home goods. Your understanding of the voice command system's operation improves with continued use. As a result, your routines and preferences will be understood by the Home Mate smartdevices. In addition, the Google Assistant and Amazon Alexa assistants maypick up on your daily routines, favorite music, preferred temperature settings, lighting patterns, and a lot more.

LIMITATIONS

Additional conditions include taking into account the restrictions, which is essential to carrying out the entire procedure successfully and without hiccups. As a result, the system may be utilized as much as necessary as long as it complies with all applicable restrictions. Given that this project relies on Bluetooth and the Internet, it is imperative that these resources be freely accessible in order to complete the assignment.

Range: The first thing to keep in mind is that its range is limited. Since we rely on these services via Wi-Fi or Bluetooth modules, we must be mindful of their range. For example, a Bluetooth module must constantly be within a certain range in order to be linked to a mobile device, therefore it's critical to keep this in mind when carrying out tasks. Since the Bluetooth range is limited to 10 meters when we utilize it. But by using the internet, we can get around that problem.

Voice

One of the main issues for non-Americans will be voice. It needs an American accent because I'm using Google Voice recognition software to interpret the voice as a command. It will not understand voices with UK accents, therefore anyone from Scotland or the UK may have some trouble managing it.

Expertise: If there is anything that has to be changed, we will need an expert. For example, if someone purchases our product and wishes to extend the house, he will also need to expand the system. At this stage, in order to alter, amend, edit, or remove any command from the system, they will require a skilled programmer.

CONCLUSION

Voice control for home utilities is a fantastic advancement in the Internet of Things space because it uses only wireless technology to establish the connection. Numerous programs for Android have been created to start working on this technology, which also includes voice-activated wheelchairs, among other things. All of the earlier trials and studies that we have conducted have made use of the same notion to be implemented in an effective manner, allowing more people to benefit from things that just require a spoken command to function, such as residential utilities. There is little doubt that if this technology is applied more widely,it will revolutionize people's lives.

We have launched a platform after conducting extensive research and analysis; further work in this area may yield an improved format down the road. However, given all of the current technology, this is novel in a lot of ways and merits widespread acceptance due to its benefits for the elderly and other specific populations. Wirelessly controlling appliances like fans, lights, and heaters is unquestionably a remarkable advancement in this century; yet, security flaws and vulnerabilities continue to be a source of concern in an effort to improve upon this technology even more.

To make life even easier, we are focusing more on this technology. In this century, everyone is concentrating on making people's lives more comfortable. This is but a single step toward the ultimate objective; there are still numerous obstacles to overcome. The legal, ethical, social, and environmental considerations must always be taken into consideration when proposing a project because these are the fundamental tenets of any activity done for the welfare of the public.

REFERENCES

1. K. A. H. Ahmed El Shafee, "Design And Implementation Of A Wifi BasedHome Automation System," International Journal Of Computer, Electrical, Automation, Control And Information Engineering, Vol. Vol: 6, No. No: 8, 2012.

2. M. Field, Dec 2017. [Online]. Available: Http://Www.Telegraph.Co.Uk/Technology/0/Amazon-Echo-Google-Home-Best-Smarthome-Devices-2018/. [Accessed 12 10 2017].

3. M. G. S. M. R. K. A. K. Kim Baraka, "Low Cost Arduino/Android-BasedEnergy-Efficient Home Automation System With Smart Task Scheduling," In Fifth International Conference On Computational Intelligence, Communication Systems And Networks., London, 2013.

4. S. A. A. W. C. A. N. M. V. H. Rozita Teymourzadeh, "Smart Gsm Based Hom Automation System," In Ieee Conference On Systems, Process & Control, Kuala Lumpur, Malaysia,

5. A. M. K. Rupam Kumar Sharma, "Android Interface Based Gsm Home Security System," In Ieee, Ghaziabad, India,