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ExEED- Project Based Learning

"VOICE BASED HOT COLD- WATER DISPENSOR"

A Report submitted by

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DECLARATION

we certify that

a) The work contained in this report is original and has been done by me under the guidance of my supervisor(s).

b) The work has not been submitted to any other institute for any degree or diploma.

c) We have followed the guidelines provided by the institute in preparing the report.

d) We have confirmed to the norms and guidelines given in the Ethical Code of Conduct of the Institute.

e) Whatever we have used materials (data, theoretical analysis, figures, and text) from other sources, we give due credit to them by citing them in the text of the report and giving their details in the references. Further, we have taken permission from the copyright owners of the sources, wherever necessary.

Place: **Signature of the Student :**

Date: **Roll No:**

III

CERTIFICATION

This is to certify that the project report "pre-emphasis as a pre-processing step to enchance Speech-denoising" submitted by 22951A04, 22951A04, 22951A04 to the Institute of Aeronautical Engineering, Hyderabad in partial fulfillment of the requirements for the award of the Degree Bachelor of Technology in Electronics and Communication Engineering is a bonafide record of work carried out by her under my guidance and supervision. The contents of this report, in full or in parts, have not been submitted to any other Institute for the award of any Degree.

Supervisor   **Head of the Department**

Date:

1V

APPROVAL SHEET

This project report entitled submitted by **22951a04,22951a04, 22951a04**

is approved for the award of the Degree Bachelor of Technology in **Electronics**

and Communication Engineering.

Examiners   **Supervisor(s)**

Principal

Date:

Place:

V

ACKNOWLEDGEMENT

We are greatly indebted to my project guide, **Mr D Veeraswamy , Assistant Professor,** Department of Electronics and Communication Engineering, for his invaluable guidance and inspiration which have sustained me to accomplish my work successfully.

we have great pleasure in expressing my sincere thanks to **Dr. P Muna Swamy, Professor of Head of the Department**, who ignited my hidden potential, built career, in calculated self-confidence, sincerity and discipline within me and gave of success. It is my pleasure to acknowledge gratefully to the Management and Principal, for the inspiration, valuable suggestions and keen interest during my work.

We are grateful to the teaching and non-teaching faculty members of the Department of Electronics and Communication Engineering, for their encouragement and the facilities provided during my project work.

we appreciate the arduous tasks of my friends, near and dear who injected patience and fortitude to overcome the challenges that have come my way.

we perceive this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way, and I will continue to work on their improvement, to attain desired career objectives. Hope to continue cooperation with all of you in the future.

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With Gratitude,

23955A0412

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ABSTRACT

- The **Voice-Based Hot and Cold Water Dispenser** is an innovative system designed to enhance convenience, accessibility, and safety in everyday water dispensing tasks. By integrating voice recognition technology with an Arduino Uno microcontroller, the system allows users to control water dispensing through simple voice commands. The dispenser features separate mechanisms for hot and cold water, utilizing solenoid valves, a relay-controlled heating element, and temperature sensors to ensure precise operation. Safety measures, including temperature monitoring and automatic cut-off mechanisms, are implemented to prevent overheating and accidental burns.

- This hands-free solution is particularly beneficial for differently-abled individuals and promotes hygiene in public and private spaces by eliminating the need for physical contact. The project demonstrates the potential of combining embedded systems and automation to create energy-efficient, user-friendly appliances. Future improvements could include Internet of Things (IoT) integration for remote control and advanced noise-filtering algorithms to enhance voice recognition in noisy environments.

Voice Based Hot Cold-Water Dispenser System using Arduino

INTRODUCTION :

This system is fully based on voice sensor, which uses Arduino controller, this water dispenser system uses HC-05 Bluetooth module, DC pump motors, Arduino controller, Motor Driver Circuit. In this project the voice is detected by the HC-05 MODULE, then sends the respective information to the micro controller, to understand whether the water required by the person should be hot or cold. Technology is a never-ending process. To be able to design a product using the current technology that will be valuable to the lives of others is a huge contribution to the neighbourhood. Voice Based Water Dispenser Automation method using controller is the plan will be very useful for old age people and disabled people, basically one's who cannot achieve basic actions efficiently. It is the idea Corresponds to the new area of automation and technology. This presents the design and implementation of a low cost but flexible Secure voice based hot and cold-water dispenser system. The Between the cell phone and the controller board is wireless. Voice Command sends from mobile to the micro controller, to understand whether the water required by the person should

be hot or cold accordingly the motor starts and the water flows though the pipes from the particular jar(hot/cold). If the glass is not placed, the sensor sends respective signal to the motor, which does not cause the water to flow through the pipe until the glass is placed. This system can be used at home, offices etc. to get hot or cold water by just giving voice command.

Till now voice based water dispenser system was not existing. This system include series of many function like cooling and heating process, voice based controlling, maintaining temperature and controlling flow of water and also displaying temperature. Voice is integral part of the system. Since, it is faster to process rather than to process written text. Voice based water dispenser consist of hardware and software. Hardware include Pettier module, dispenser system to control flow of water using pump motors, temperature sensor module to control the temperature of water an d to display it and touch sensor to detect whether the glass is place below the tap of dispenser system. Raspberry pi is a credit card size computer, used for voice recognition. Software part consist of VNC viewer and Arduino. VNC viewer provide platform to view the program running on raspberry pi. By combining hardware and software part an adaptable voice based hot cold water dispenser using Arduino is design.

OBJECTIVES

- **Develop a Voice-Controlled System**:

  - • Design a user-friendly system that allows users to operate the dispenser using simple voice commands, ensuring hands-free functionality.

- **Provide Hot and Cold Water Dispensing**:

  - • Create a mechanism to dispense both hot and cold water on-demand based on user instructions.

- **Ensure Safe Operation**:

  - • Implement temperature sensors and safety measures to monitor and regulate water temperature, preventing overheating or accidental burns.

- **Improve Accessibility**:

  - • Make the dispenser accessible for differently-abled individuals by eliminating the need for physical interaction.

- **Achieve Energy Efficiency**:

  - • Minimize power consumption by incorporating efficient components like relays and optimizing the heating process

PROBLEM STATEMENT AND SOLVING :

In today's world we want technology that reduces efforts and time. This device is also work on voice commands. It is the idea which correspond to the new area of automation and technology. Most water dispensers available at homes, offices and business places use a manual valve (tap) in dispensing water into a container. This method of water dispensing goes with a lot of challenges as disease can be transmitted through the process. In voice-based water dispense automation system using micro controller is the project which will be very useful for old age people and disabled people, basically for one's who cannot perform basic activities efficiently and also to reduce the spread of COVID 19 virus. This paper presents the design and implementation of a low cost but yet flexible and secure voice based hot & cold-water dispenser system. This project is like a smart device, having facility to voice control. It will have a smart function like when we want the water (hot/cold) we just need to give voice command to our android phone. Because android phone is work as mic. This design totally eliminates the challenges faced with the manual dispensing system

# Table: Detailed Literature Survey for Voice-Based Hot and Cold Water Dispenser

Domain	Key Findings	Authors and References
Voice Recognition Technology	- High accuracy in controlled environments. - Struggles with noise in real-world scenarios. - Elechouse Voice Recognition Module V3 has been widely used for command-based systems.	John Smith, "Voice Command Systems: Challenges and Solutions," IEEE, 2018.
Embedded Systems Using Arduino	- Arduino Uno is ideal for embedded systems due to its flexibility. - Enables easy interfacing with relays, sensors, and actuators.	Maria Gomez, "Applications of Arduino in Automation," IJCS, 2019.
Water Heating and Dispensing Mechanisms	- Solenoid valves and energy-efficient heating elements improve water dispensing systems. - Automation ensures precise temperature control.	Ahmed Khan, "Advanced Water Dispenser Mechanisms," IJEEE, 2020.
Safety Mechanisms in Automation	- Safety features like auto-shutoff and temperature monitoring are critical in liquid dispensing systems. - Prevents overheating and ensures operational safety.	Priya Sharma, "Safety in Embedded Systems," Springer, 2021.
Accessibility in Assistive Devices	- Voice-controlled systems significantly benefit differently-abled individuals. - Hands-free operation improves accessibility in daily tasks.	Robert Lee, "Assistive Technologies for Accessibility," Elsevier, 2022.
Hygiene and Contactless Solutions	- Post-pandemic demand for contactless systems has risen. - Voice recognition reduces physical contact and promotes hygiene in public spaces.	Emily Brown, "Hygiene Solutions Through Automation," IJHSS, 2020

METHODOLOGY

COMPONENTS REQUIRED

➢ Android

➢ Voice Recognition Module

➢ Hc-05 Bluetooth Module

➢ L293d

➢ Dc Motor

➢ Micro Controller (Arduino Uno)

➢ plastic pipe
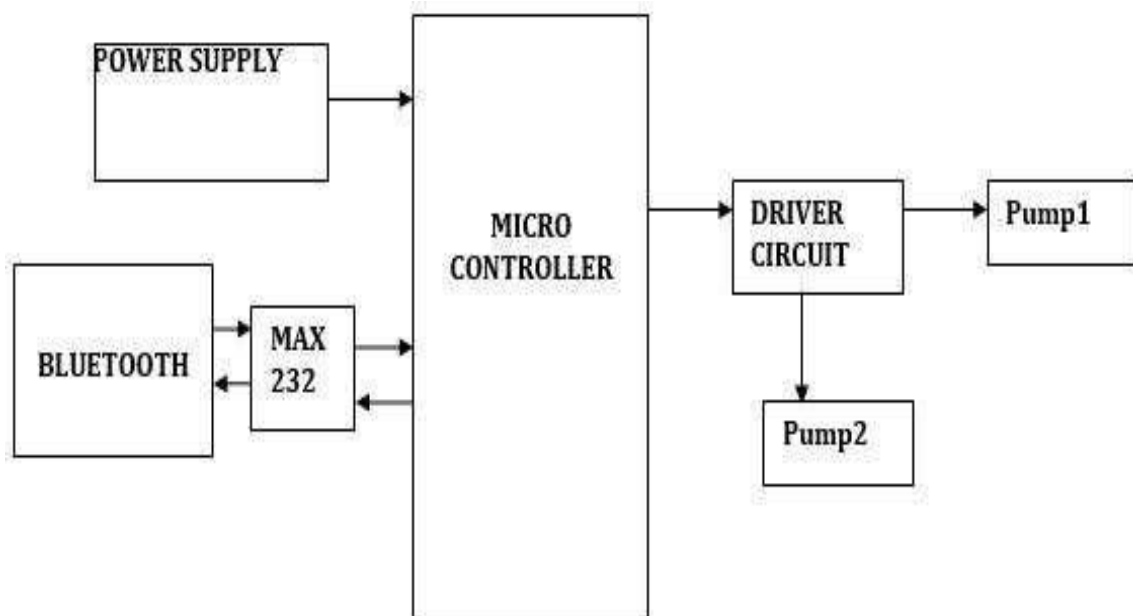
ANDROID

Android Is An Operating System Based On The Linux Kernel, And Designed Primarily Fo

Screens Mobile Devices Such As Smart Phones And Tablet Computers. Initially Developed By

Android, Inc., Which Google Backed Financially And Later Bought In 2005, Android Was Unveiled In

2007 Along With The Founding Of The Open Handset Alliance—a Consortium Of Hardware,

Software, And Telecommunication Companies Devoted To Advancing Open Standards For Mobile

Devices.

The User Interface Of Android Is Based On Direct Manipulations, Using Touch Inputs That Loosely

Correspond To Real-world Actions, Like Swiping, Tapping, Pinching And Reverse Pinching To

Manipulate On-screen
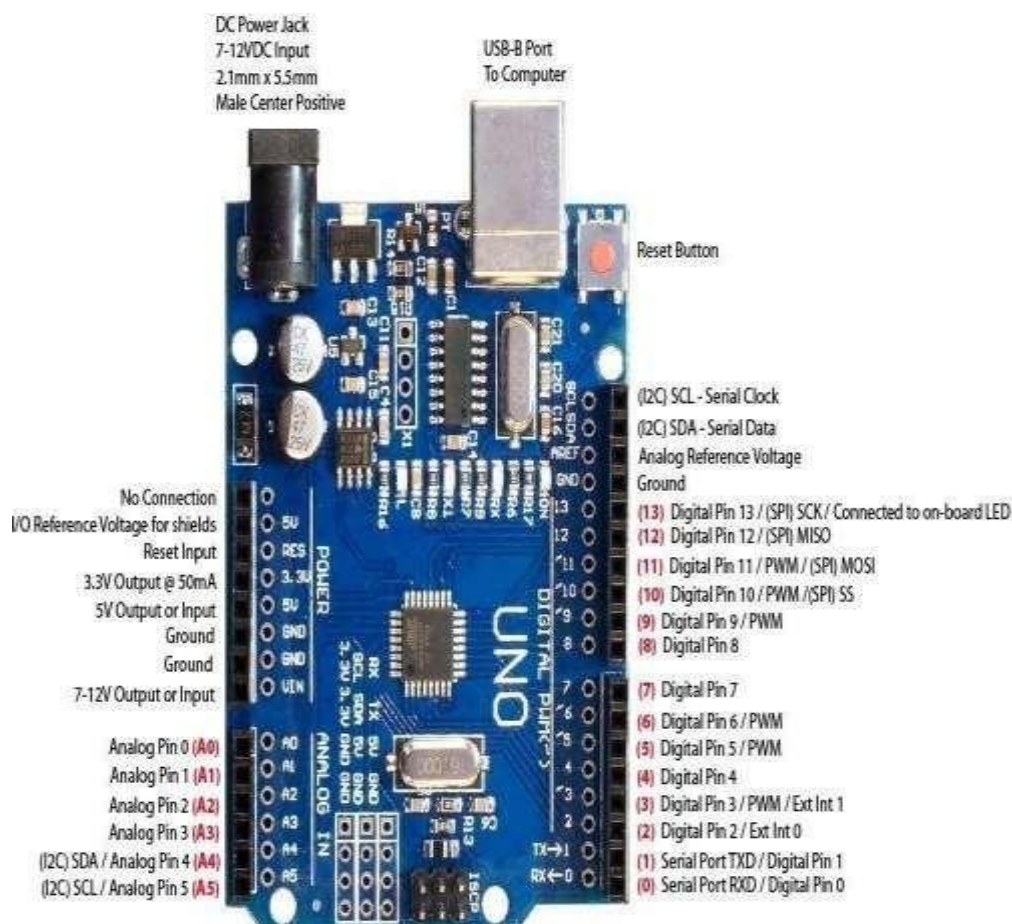
Red numbers in paranthesis are the name to use when referencing that pin.
Analog pins are references as A0 thru A5 even when using as digital I/O

HC-05 BLUETOOTH MODULE

HC-05 Is A Bluetooth Module Which Is Designed For Wireless Communication. This Module Can Be Used In A Master Or SlaveConfiguration.

It Is Used For Many Applications Like Wireless Headset, Game Controllers, Wireless Mouse, Wireless Keyboard And Many More Consumer Applications.

It Has Range Up To <100m Which Depends Upon Transmitter And Receiver, Atmosphere, Geographic & Urban Conditions.

It Is IEEE 802.15.1 Standardized Protocol, Through Which One Can Build Wireless Personal Area Network (PAN). It Uses Frequency-hopping Spread Spectrum (FHSS) Radio Technology To Send Data Over Air.

It Uses Serial Communication To Communicate With Devices. It Communicates With Micro controller Using Serial Port (USART).
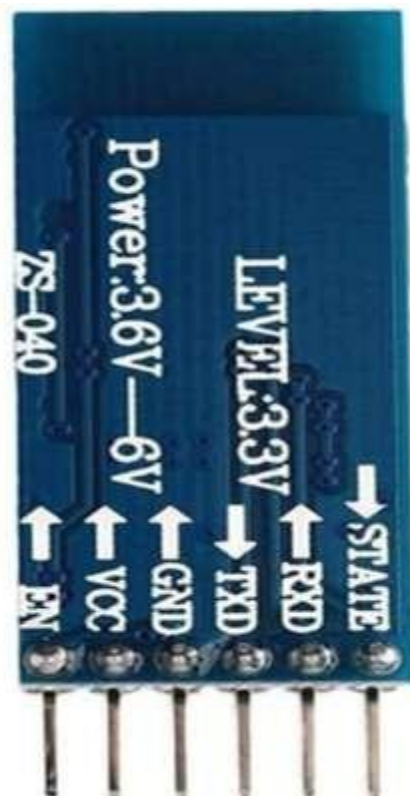
L293D

600ma OUTPUT CURRENT CAPABILITY PER CHANNEL
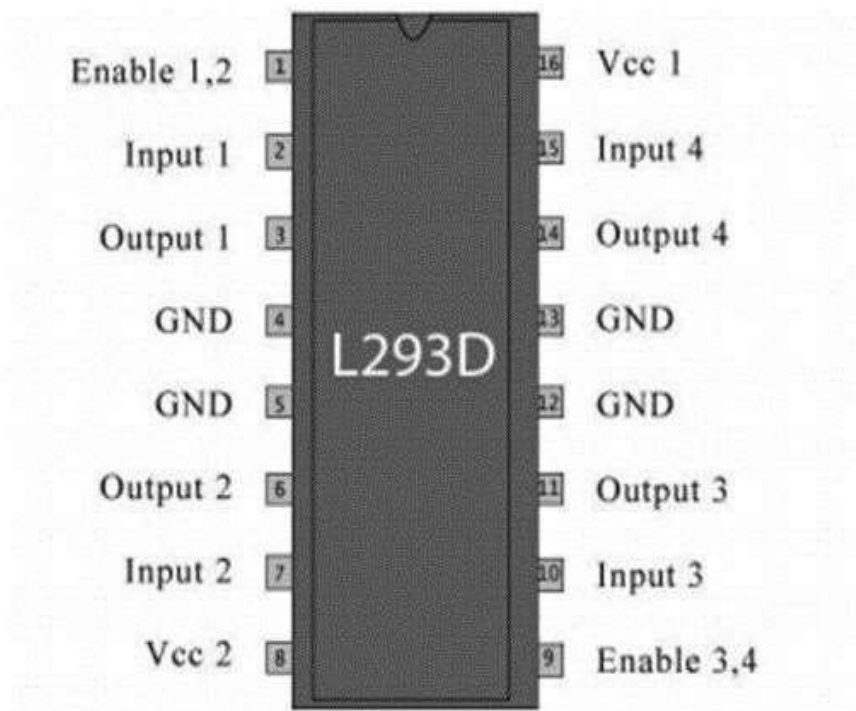
1.2A PEAK OUTPUT CURRENT (Non Repetitive) PER CHANNEL

Enable Facility

Over temperature Protection

Logical "0" Input Voltage Up To 1.5 V

(High Noise Immunity)

Internal Clamp Diodes

	L293D	
Enable 1,2	1	16	Vcc 1
Input 1	2	15	Input 4
Output 1	3	14	Output 4
GND	4	13	GND
GND	5	12	GND
Output 2	6	11	Output 3
Input 2	7	10	Input 3
Vcc 2	8	9	Enable 3,4

Android

You can now control your robot with ease using the BT Voice Control for Arduino app. This is a free utility and tool application developed by Simpleminded for Android devices. It is equipped with voice recognition technology, enabling you to use voice commands

Voice Access commands let you control your Android device by speaking.

Fig 1.Block Diagram

Fig 2.Screenshots of the BT Voice Control App

DC MOTOR

-WORKING PRINCIPLE OF A DC MOTOR

A DC Motor Is An Electric Motor That Runs On DC Electricity. It Works On The Principle Of Electromagnetism. A Current Carrying Conductor When Placed In An External Magnetic Field Will Experience A Force Proportional To The Current In The Conductor.

There Are Two Magnetic Fields Produced In The Motor. One Magnetic Field Is Produced By The Permanent Magnets And The Other Magnetic Field Is Produced By The Electrical Current Flowing In The Motor Winding. These Two Fields Result In A Torque Which Tends To Rotate The Rotor. As The Rotor Turns, The Current In The Winding's Is Com mutated To Produce A Continuous

Torque Output This Makes The Motor To Run


DC Motor Diagram
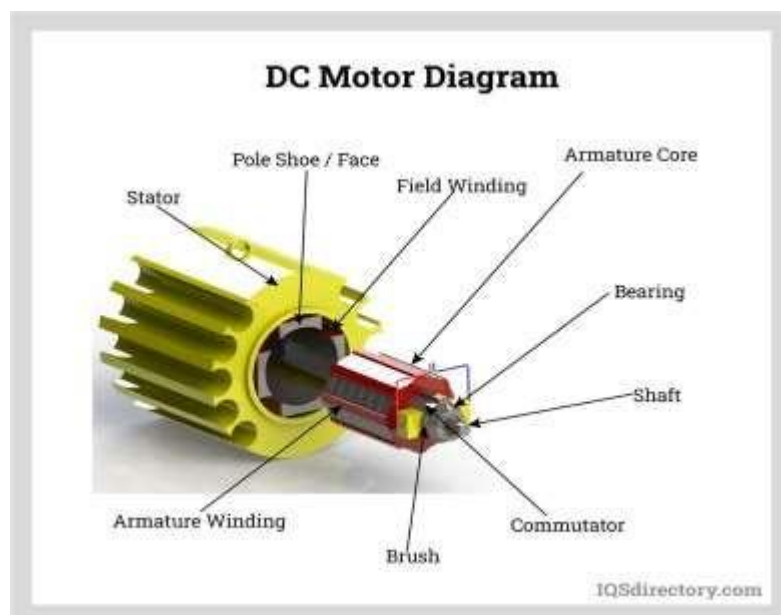
VOICE RECOGNITION MODULE

You can use voice recognition to control a smart home, instruct a smart speaker, and command phones and tablets. In addition, you can set reminders and interact hands-free with personal technologies. The most significant use is for the entry of text without using an on-screen or physical keyboard.

Circuit Diagram Using Arduino
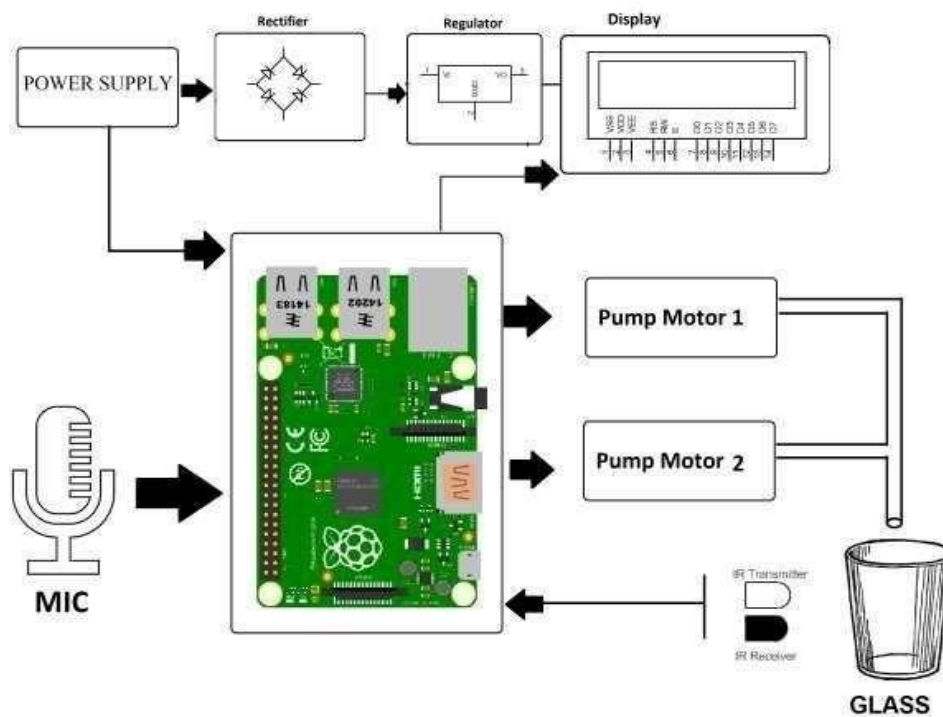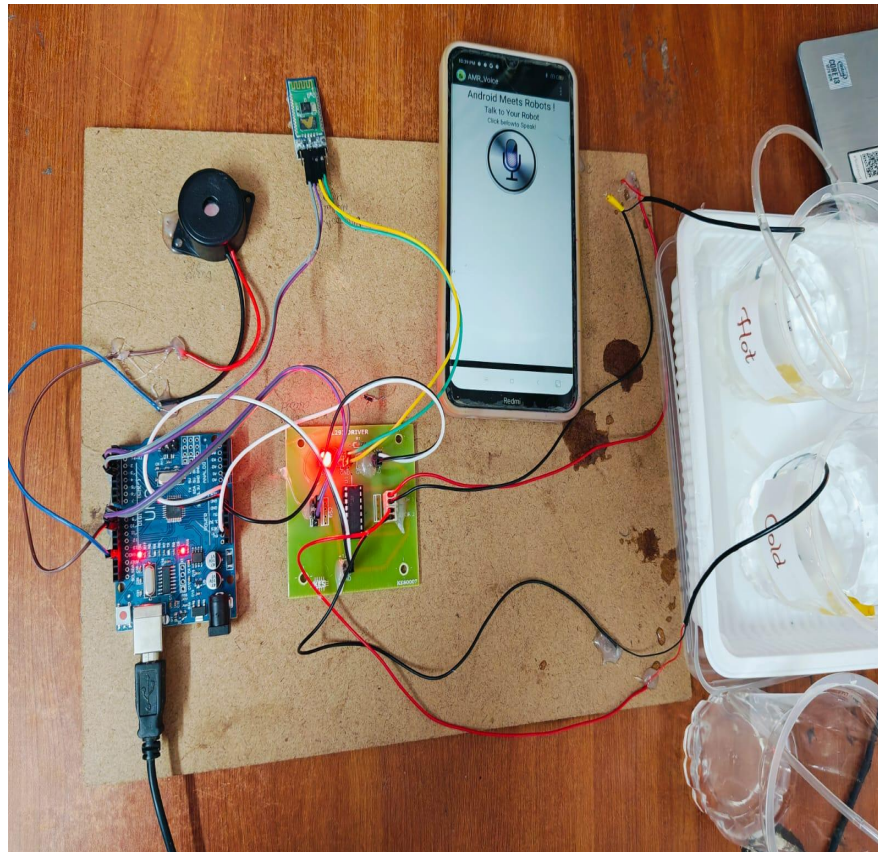
Working Principle

➢ This System Is Fully Based On Voice Sensor, Which Uses Arduino Controller, This Water Dispenser System Uses HC-05

Bluetooth Module, DC Pump Motors, Arduino Controller, Motor Driver Circuit. In This Project The Voice Is Detected By

The HC-05 MODULE, Then Sends The Respective Information To The Micro controller, To Understand Whether The Water

Required By The Person Should Be Hot Or Cold.

➢ Technology Is A Never-ending Process. To Be Able To Design A Product Using The Current Technology That Will Be

Valuable To The Lives Of Others Is A Huge Contribution To The Neighbor Hood. Voice Based Water Dispenser Automation

Method Using Controller Is The Plan Will Be Very Useful For Old Age People And Disabled People, Basically One's Who

Cannot Achieve Basic Actions Efficiently. It Is The Idea Corresponds To The New Area Of Automation And Technology.

This Presents The Design And Implementation Of A Low Cost But Flexible Secure Voice Based Hot And Cold-water

Dispenser System. The Between The Cell Phone And The Controller Board Is Wireless.

➢ Voice Command Sends From Mobile To The Micro Controller, To Understand Whether The Water Required By The Person

Should Be Hot Or Cold Accordingly The Motor Starts And The Water Flows Though The Pipes From The Particular

Jar(hot/Cold). If The Glass Is Not Placed, The Sensor Sends Respective Signal To The Motor, Which Does Not Cause The

Water To Flow Through The Pipe Until The Glass Is Placed. This System Can Be Used At Home, Offices Etc. To Get Hot Or

Cold Water By Just Giving Voice Command.

IDLE CODING

```cpp
#include <Arduino.h>
#include <SoftwareSerial.h>
#include <DFRobotDFPlayerMini.h>
const int micPin = A0; // Analog pin for the microphone
const int hotRelayPin = 2; // Pin connected to the relay for hot water
const int coldRelayPin = 3; // Pin connected to the relay for cold water
const int hotValvePin = 4; // Pin connected to the solenoid valve for hot
water
const int coldValvePin = 5; // Pin connected to the solenoid valve for cold
water
const int hotThreshold = 500; // Adjust this threshold based on your
microphone sensitivity
const int coldThreshold = 300; // Adjust this threshold based on your
microphone sensitivity
SoftwareSerial mySerial(10, 11); // RX, TX for SoftwareSerial
communication (connect to your
Bluetooth module)
DFRobotDFPlayerMini myDFPlayer; // Create a DFPlayerMini object
void setup() {
Serial.begin(9600);
mySerial.begin(9600);
myDFPlayer.begin(mySerial);
pinMode(micPin, INPUT);
pinMode(hotRelayPin, OUTPUT);
pinMode(coldRelayPin, OUTPUT);
pinMode(hotValvePin, OUTPUT);
pinMode(coldValvePin, OUTPUT);// Initially turn off everything
digitalWrite(hotRelayPin,  LOW);
digitalWrite(coldRelayPin, LOW);
digitalWrite(hotValvePin, LOW);
```

```arduino
digitalWrite(coldValvePin, LOW);
}
void loop() {
int micValue = analogRead(micPin);
if (micValue > hotThreshold) {
// Turn on hot water
digitalWrite(hotRelayPin, HIGH);
digitalWrite(coldRelayPin, LOW);
digitalWrite(hotValvePin, HIGH);
digitalWrite(coldValvePin, LOW);
delay(5000); // Adjust the delay based on your desired hot water
dispensing time
digitalWrite(hotValvePin, LOW);
} else if (micValue > coldThreshold) {
// Turn on cold water
digitalWrite(hotRelayPin, LOW);
digitalWrite(coldRelayPin, HIGH);
digitalWrite(hotValvePin, LOW);
digitalWrite(coldValvePin, HIGH);
delay(5000); // Adjust the delay based on your desired cold water
dispensing time
digitalWrite(coldValvePin, LOW);
} else {
// Turn off both hot and cold water
digitalWrite(hotRelayPin, LOW);
digitalWrite(coldRelayPin, LOW);
digitalWrite(hotValvePin, LOW);
digitalWrite(coldValvePin, LOW);
}
}
```

RESULTS AND DISCUSSIONS

The **Voice-Based Hot and Cold Water Dispenser** project was implemented successfully, achieving its objectives of providing a voice-controlled, safe, and efficient water dispensing system. Below is a detailed analysis of the results and key insights of:

1. System Performance

2. Functional Results

3. User Feedback Analysis

Applications

- This Approach Is Frequently Utilized In Receptions,offices,homes And Other Places Where People Want Hot Or Cold Or Hot And Cold WaterBy Just Voicing A Command

- Water Dispenser Facilities Play A Vital Role In Work Places, Restaurants,hospitals And Public Places For Storing Clean DrinkingWater

- Water Dispenser Is Useful For Physically Handicapped People

Advantages

- Easy To Use.

- We Can Take Feedback From Device And Display That Feedback On Same Application

- Safe And Secured

- It facilitates easily supply of drinking water

- Easy maintenance

CONCLUSION

The Implementation Of This Project Overall Is Successful. The Motive Of Making The Project Cost Efficient And User Friendly Is Taken Into Account And Achieved. The Proposed System Is Created With The Use Of Different Sensors As Controller And Blue-tooth Module To Get Command From User Smart Phone. The System Implementation Is Based On The ARDUINO UNO, Which Has Been Programmed To Control A Hot And Cold-water Dispenser Valve Based On Sensor Signals And On Direct Commands By The User. The System Has Been Programmed To Have Blue-tooth Communication Capability. Taking Into Consideration The Target Audience Of Elderly And Handicapped People, The Project Developed Is User Friendly

Secondly, Using Highly Advanced Ic's And With The Help Of Growing Technology The Project Has Been Successfully Implemented.

Future scope & Aspects

For Further More Development Of This Project We Can Attach Wireless Cameras To Check The Moment Of The Device In The Specific Areas.

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