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ARDUINO-ANDROID ROBOT FOR AGED PEOPLE

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Abstract - *Arduino-Android Robot is a voice controlled robot has the ability to understand the voice and give response to the command given to the robot. The robot is controlled by an android application via Bluetooth signal. In this application we can save our commands and it will respond to our commands. The robot can able to move forward, backward, left and right according to the commands given to the motor driver L293D (H-Bridge) from Arduino UNO. When we put it in line following mode it will works as a line follower by our command.*

Key Words: **Arduino, Android, Bluetooth, Robot, Voice control.**

1.INTRODUCTION

Robotics plays an important role in this developing world. This is also a robot, which can lift things from place to place within the house and also outside the house. It is much more suitable for people who aged above 50. Those people cannot easily lift the vessels, cooker and utensils used for cooking purpose from kitchen to dining hall. They can use it to lift and transport those things from kitchen to dining hall and grocery shop to house. we can control it by manually and also by line following method. The components used are arduino module, IR sensor, motor drivers, motors, Bluetooth module.

2.METHODOLOGY

Arduino is an open source platform and we can do many projects with the use of it. In this, we use it as a brain of the robot. Arduino receives the input from the user and analyze it whether the input matches the command are not. The voice command is given to the robot by an android app using speech recognition extension in MIT app inverter. Speech recognition (voice recognition) is a technique which converts our voice into text. Humans are mostly made their communication through their voice. So only, we used voice recognition in this robot. It will make us easy to control the robot. The line following technique will work with the help of IR sensor.

3.WORKING

Arduino UNO has 14 digital I/O pins of which 6 provides PWM outputs and 6 analog pins. It has flash memory of 8KB and SRAM of 1KB. We used it as a robotic brain. It controls the overall system of robot and the arduino is controlled by the user's voice command. The Bluetooth module is connected with the arduino UNO. We use it to transmit and receive the signals from the user. The RX pin of the Bluetooth is connected with the TX pin of the arduino and the TX pin of the Bluetooth is connected with the RX pin of the arduino. The RX pin of arduino receives the information from the user and the TX pin of arduino transmits the information from arduino to the user. The input voltage pin of the Bluetooth is connected to the 5V pin of the arduino UNO. And the GND pin of the Bluetooth is connected with the GND pin of the arduino.

The motors of the robot is connected with the motor driver L293D (H-Bridge). The arduino provide the input signals to the motor drivers. There are four motors used for the movement of the robot. The tyres are attached with the motors for the movement.

MODES OF CONTROL

The robot is controlled by an android application. There are two modes of control

1. Manual Mode
2. Line Follower Mode

We can control the robot by the above modes.

MANUAL MODE

In manual mode, we can control the robot using voice commands. There are five commands. There are five signals behind this five commands. The commands and signals are as follow.

COMMANDS	SIGNALS
Front	F
Back	B

Left	L
Right	R
Stop	S

When we say the command "Front", the signal 'F' will sent to arduino from the android device through Bluetooth and this signal will be received by the Bluetooth module connected with the arduino module. Like this all the commands and signals will work.

By using this commands, we can easily operate our robot inside our house or on the streets. And also we can change the commands and its signals in the android application. The sending and receiving speed of Bluetooth module is 1Mbps. Arduino only receives the serial signals. So only, we use characters as signals.

LINE FOLLOWING MODE

In Line Following Mode, the robot will acts as a line follower. When we have to lift an object from one room to another inside a house or in a factory, We can use this robot to shift those things. Before that we have to turn on the line following mode from our android device.

SPECIAL COMMANDS

We embedded some special commands in this android application. Those commands are used

- To make a call
- To know the time, date and day
- To know the latitude, longitude and location of the robot.
- It also intimates us to eat the food and medicine at the correct time we mentioned on commands. We can also mention of the name of the medicine.

BLOCK DIAGRAM

This block diagram shows that:

- The User send command to the robot.
- The command received by Bluetooth module HC-05. It is connected with the arduino module.
- Arduino read the signal from the Bluetooth and give response to it.

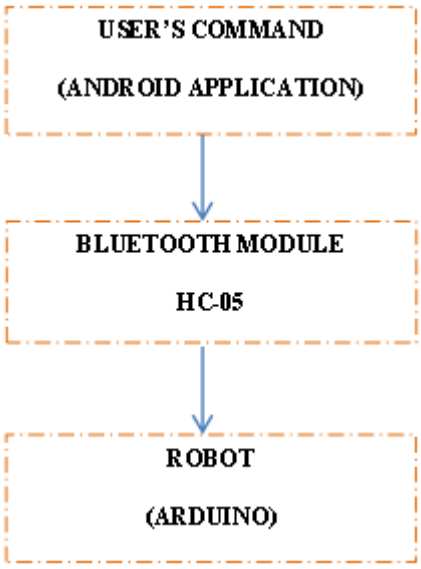

Fig -1: Block Diagram

ANDROID APPLICATION

This robot is controlled by an android application. We created this application using MIT APP INVERTER. In this application, we used continuous speech recognition extension to recognize our speech. We can save our commands in this application.

Fig -2: Android Application (commands)

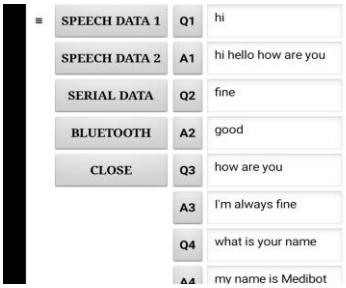

Fig -3: Android Application (Data)

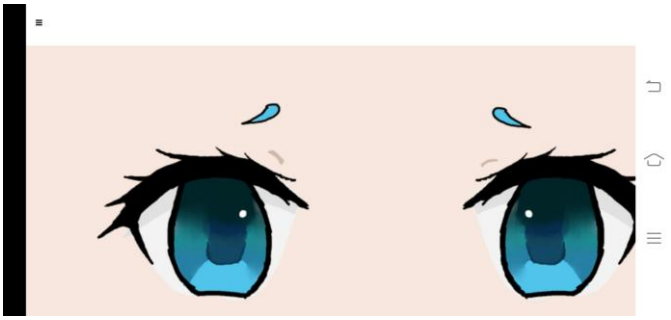

Fig -4: Android Application (Face)

Fig -4: Android Application (Home)

ADVANTAGES

1. It will be very useful for the aged people to lift weights.
2. Cost of the robot is efficient.
3. We can make calls and also find our locations using this robot.
4. Light weight.

CONCLUSION

Our work of this project show that how can we make a robot using Arduino-Android combination using Bluetooth module and speech recognition extension. The voice commands are transmitted successfully via Bluetooth technology. This prototypic project review the voice controlled system and android application combined with a robot.

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