SERVING ROBOT

A PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this **JEC1521 Mini Project Report** titled **"SERVING ROBOT"** is bonafide works of **"DHARSHINI C (130719106007), EMALDA PREETHI L (130719106008), NITHYALAKSHMI P (130719106022) VAISHNAVI C A S (130719106044)"** who carried out the project work under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

The project outlines the design and development of a Serving Robot which is considered as a possible solution to address the lack of human resource and to introduce Automation. The Human waiters are replaced by the Robots as Servers and Waiters in cafes, restaurants and Hotels. The lack of human resource can be addressed by automation through an electronically automated system called “Serving Robot” which does the job of a Waiter, Server as well for ordering food items and beverages.

Keywords – Serving robot, automation.

CHAPTER 1

INTRODUCTION

1.1 GENERAL

As the world is emerging towards new trends and technologies, there is a need to invent something that is more attractive and useful for the citizens. In the present approach we are introducing Automation into picture which makes things much simple. Basically, Robotic Process Automation is a technology that uses robots to automate monotonous tasks and manual processes. The entities which emulates certain actions are called Robots. Automation is any process which is done by minimal human assistance.

The objective of a SERVING ROBOT is to serve the customers effectively. i.e) Reducing manpower and assisting Artificial Intelligent Robots. Serving Robot is designed to reduce the work load of a servant who works in various sectors like hospitals, hotels, restaurants, military, and to increase the efficiency. When the servants are replaced by robots, it will be a One-time investment in the system.

CHAPTER 2

HARDWARE DESCRIPTION

2.1 ARDUINO UNO

The Arduino is an open source electronics platform based on easy to use hardware and software. The open source Arduino software makes it Easy to write code and upload it to the board. It runs on Windows, Mac OS X and Linux. The environment is written in java and based on Processing and other open source software. Arduino board is show in figure 4.

This software can be used with any Arduino board. The Arduino software IDE contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common function. It connects to Arduino and Genuine hardware to Upload programs and communicate with them. Program written using Arduino software are called sketches.

Fig. 1 Arduino UNO Board

2.2 JUMPER WIRES

Though jumper wires come in a variety of colours, the colours don't mean anything. This means that a red jumper wire is technically the same as a black one. But the colours can be used to your advantage in order to differentiate between types of connections, such as ground or power. While jumper wires are easy and inexpensive to purchase, it can also be a fun task to challenge students to make their own. Doing so requires insulated wire and wire strippers. However, beware that it is important not to nick the wire when stripping off the insulation.

Fig.2 Jumper wires

2.3 18650 BATTERY

The 18650 battery has a voltage of 3.6v and has between 2600mAh and 3500mAh (mili-amp-hours). (Osborne, 2019) These batteries are used in flashlights, laptops, electronics and even some electric cars because of their reliability, long run-times, and ability to be recharged hundreds of times over.

Fig 3 18650 Battery

2.4 9V BATTERY

A nine-volt battery, either disposable or rechargeable, is usually used in smoke alarms, smoke detectors, walkie-talkies, transistor radios, test and instrumentation devices, medical batteries, LCD displays, and other small portable appliances.

Fig 4 9V battery

2.5 SOLDERING IRON

A soldering iron is a hand tool used to heat solder, usually from an electrical supply at high temperatures above the melting point of the metal alloy. This allows for the solder to flow between the workpieces needing to be joined.

Fig 5 Soldering iron

2.6 WHEELS

A wheel is a circular component that is intended to rotate on an axle bearing. The wheel is one of the key components of the wheel and axle which is one of the six simple machines. Wheels, in conjunction with axles, allow heavy objects to be moved easily facilitating movement or transportation while supporting a load, or performing labor in machines. Wheels are also used for other purposes, such as a ship's wheel, steering wheel, potter's wheel and flywheel. Common examples are found in transport applications. A wheel greatly reduces friction by facilitating motion by rolling together with the use of axles. In order for wheels to rotate, a moment needs to be applied to the wheel about its axis, either by way of gravity or by the application of another external force or torque.

Fig 6 Wheels

2.7 GEAR MOTOR

A gear motor is an all-in-one combination of a motor and gearbox. The addition of a gear head to a motor reduces the speed while increasing the torque output. The most important parameters in regards to gear motors are speed (rpm), torque (lb-in) and efficiency (%).

Fig 7 Gear motor

2.8 MOTOR DRIVER

The L293D IC receives signals from the microcontroller and transmits the relative signal to the motors. It has two voltage pins, one of which is used to draw current for the working of the L293D and the other is used to apply voltage to the motors.

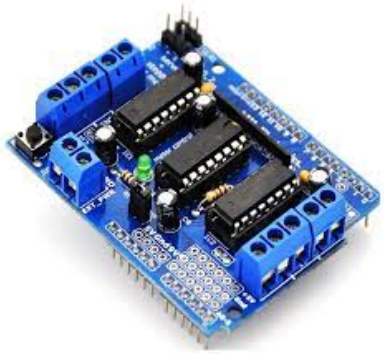

Fig 8 Motor driver

2.9 BLUETOOTH MODULE

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. HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration.

Fig 9 Bluetooth module

CHAPTER 3

CIRCUIT DIAGRAM

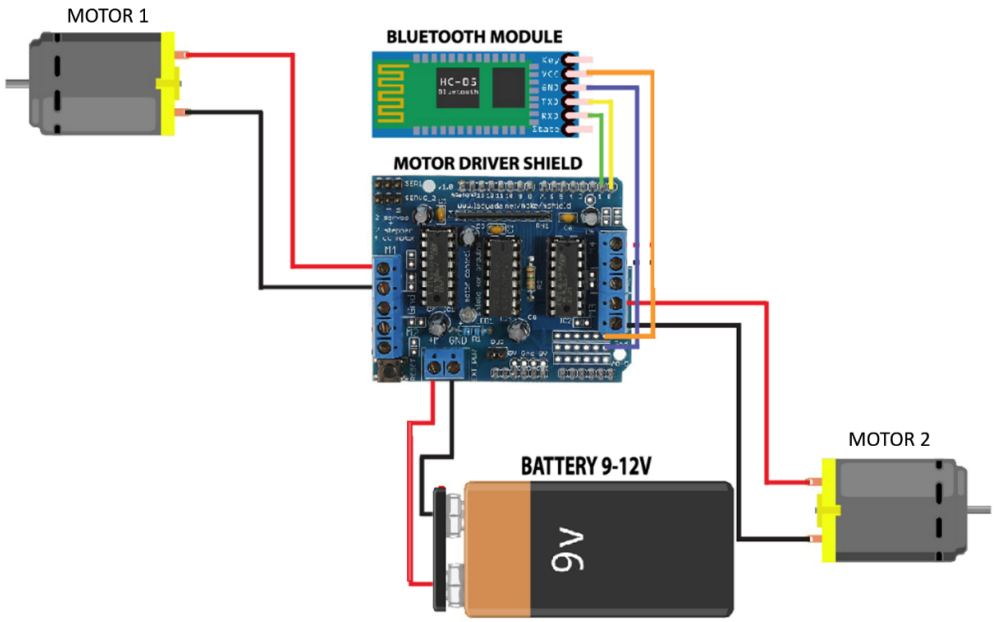

Fig 10 Circuit diagram

CHAPTER 4

PROCEDURE AND WORKING

4.1 PROCEDURE:

1. Once the circuit is complete and uploading has been done, we should open the Bluetooth RC controller app.
2. Then allow the permissions that were asked.
3. Open the settings.
4. Connect to CAR OPTION.
5. There select HC-05.
6. Connection has been made successful.

Now, we can have a control on our robot to mobilize it.

4.2 WORKING:

1. The obstacles are being observed by the operator who is monitoring the robot.
2. Then according to the obstacles, the operator operates in such a way that the serving robot moves without any disturbances in its path and fulfills its purpose.
3. The motor driver is connected with Arduino UNO which is programmed.
4. According to the inputs from the operator, the receiver receives it and the output is the movement of the robot through the mechanically connected wheels.
5. This is how we can deliver/ serve any commodity to a person through this SERVING ROBOT.

CHAPTER 5

SOURCE CODE

```
//Arduino Bluetooth Controlled Car//
//// Before uploading the code you have to install the necessary library//
//AFMotor Library
https://learn.adafruit.com/adafruit-motor-shield/library-install //
#include <AFMotor.h>
//initial motors pin
AF_DCMotor motor1(1);
AF_DCMotor motor2(2);
char command;
void setup()
{
  Serial.begin(9600);  //Set the baud rate to your Bluetooth module.
}
void loop() {
  if (Serial.available() > 0) {
    command = Serial.read();
    Stop(); //initialize with motors stoped
    //Change pin mode only if new command is different from previous.
    //Serial.println(command);
    switch (command) {
      case 'F':
        forward();
        break;
      case 'B':
        back();
        break;
      case 'L':
        left();
        break;
      case 'R':
        right();
        break;
    }
  }
}
void forward()
{
  motor1.setSpeed(255); //Define maximum velocity
  motor1.run(FORWARD); //rotate the motor clockwise
```

```
  motor2.setSpeed(255); //Define maximum velocity
  motor2.run(FORWARD); //rotate the motor clockwise
}
void back()
{
  motor1.setSpeed(255); //Define maximum velocity
  motor1.run(BACKWARD); //rotate the motor anti-clockwise
  motor2.setSpeed(255); //Define maximum velocity
  motor2.run(BACKWARD); //rotate the motor anti-clockwise

}
void left()
{
  motor1.setSpeed(255); //Define maximum velocity
  motor1.run(BACKWARD); //rotate the motor anti-clockwise
  motor2.setSpeed(255); //Define maximum velocity
  motor2.run(BACKWARD); //rotate the motor anti-clockwise
}
void right()
{
  motor1.setSpeed(255); //Define maximum velocity
  motor1.run(FORWARD); //rotate the motor clockwise
  motor2.setSpeed(255); //Define maximum velocity
  motor2.run(FORWARD); //rotate the motor clockwise
}
void Stop()
{
  motor1.setSpeed(0); //Define minimum velocity
  motor1.run(RELEASE); //stop the motor when release the button
  motor2.setSpeed(0); //Define minimum velocity
  motor2.run(RELEASE); //rotate the motor clockwise
}
```

CHAPTER 6
CONCLUSION

This project helps in reducing the lack of human resources to serve in restaurants. The Robot is cost effective once we built later just maintenance is required. In the future work the innovation of the hardware and software components will be done. This model can be used in the hospital to serve a food and medicines for the patients, and in the apartment or in some gated communities to deliver a food or food items. To be more clear and precise the present project is not for a specific use rather it has multiple uses as well. So, with the help of Server robot it is easy to achieve time efficiency, cost reduction, efficiency in work and also it addresses the requirement of man power.

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