

E- RESTAURANT MANAGEMENT SYSTEM

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Abstract: The summary of this paper is to reduce the employees work by replacing the man work with robot which will work as a server in a canteen or in a restaurant. Nowadays people don't have much time to spend in a food court and waiting for the waiter to take their order. So the intelligent system helps the people to save time and choose the menu quickly. Using the help of intelligent system customer quickly choose the menu which he/she wants to take and pay online. The menu will go to the chef and it starts to cook food and the robot will carry the food and serve it to the table. The aim of this paper is to serve the food automatically with the help of robot by reducing the number of employees so that the more customer get attracted and the owner will get more profit. Owner only have to focus on the quality of food which help to attracted the customer towards the particular restaurant and canteen.

Keywords : AVR microcontroller, Line follower, Ultrasonic Sensor, IR Sensor, Bluetooth module.

INTRODUCTION

This paper "Serving Management system" is mainly based on canteen and restaurants. Today the people are getting addicted of delicious food of restaurants and they want it at cheaper price. The younger generation don't have patience to wait for the food. The owner of the canteen focusing on fast service while increasing number. In this paper we are trying to serve the food automatically in a canteen and restaurant and fast the service of canteen and restaurant. It will attract the customer while serving delicious food at cheaper price. We are going to replace the number of employees with robot. The robot has a table like structure which will serve the food as a waiter in the canteen and in restaurant.

We have also done the software part with the help of python programming which will help the customers to order the food by their own with the help of cell phone and laptop. Robots are used to serve humanity. The branch of robotics that plays such a vital role is called "social robotics". Social robots in today's scenario are now communicating with human interacting and relating to society in all aspect and are capable of understanding social terms. As we are seeing that technology is becoming modernized in robotics and many new designs and techniques are being implemented which are able to understand human thoughts and actions. Designing of a robot can be a effective way of learning concept of human robot interaction and develop new models and protocols for the communication as well a new architecture for real time path planning and control.

LITERATURE SURVEY

The main purpose of this paper is to design autonomous robot for the management of e-restaurant which is controlled by using smart phone using wireless Bluetooth technology. With the help of designed android app the menu will be displayed

on the screen and we can easily order the food from the respective table. At the kitchen section using team viewer application the selected items will be displayed on LCD along with the table number. When the order will get prepared, the robot will take the order and serve it on the respective table.

In this paper we have tried to demonstrate a prototype of Autonomous serving robot which will bring order and serve the food to the customer. The implementation is done with available resources to reduce the cost of project. In this paper we demonstrated the idea of automatic serving robot. If a person wants to give an order then he simply open the app which is designed by us. The autonomous robot is a line follower robot.

There are some human errors which degrade the reputation of the restaurant, so this autonomous robot will also help us to build the better working condition. By our proposed autonomous robot we will overcome these kinds of human issues. Restaurant owner have to invest once in the robot and can use their services lifetime 24x7 without even paying them.

This paper contains the fully e-service based restaurant in which the paper based menu card is replaced by touchscreen based menu card. The whole system is controlled by an AVR microcontroller which are interfaced by many input and output modules to perform some special task.

The proposed system has the potential to attract the customers and they also have the efficiency to maintain the restaurants ordering and billing system. In busy hours of restaurant it is a challenge for us to maintain the coordination. So for the better coordination we have designed this autonomous robot which will coordinate and give better results.

HARDWARE IMPLEMENTATION

Different types of hardware have their own specification to perform different types of task. So we have used different type of hardware modules in our proposed model to perform some specific task which are best suitable for our model.

a. AVR MICROCONTROLLER

AVR stands for Advanced Virtual RISC. The AVR is modified Harvard architecture 8-bit RISC single chip microcontroller. The work of it is to take the command from the device and give the command to the device .and perform the task accordingly. It is the microcontroller which we are using in our model which control the whole device and perform the task according to our requirement.



Fig.1 AVR microcontroller

b. BLUETOOTH MODULE

It is a wireless technology and the work of it is to set a communication between two devices. The working of it is that it will establish a connection between a smart phone and a microcontroller. When the chef will give the command from the smart phone , it will send that command to the controller and the controller perform the task according to it and the robot will move accordingly.



Fig.2 Bluetooth module

It uses serial communication to communicate with devices. It communicates with microcontroller using serial port (USART).

c. DC MOTOR

A DC motor is an electric motor that runs on direct current power. In any electric motor, operation is dependent upon simple electromagnetism. A current carrying conductor generates a magnetic field, when this is then placed in an external magnetic field, it will encounter a force proportional to the current in the conductor and to the strength of the external magnetic field.

The working of the DC motor is to move the device according to the task given by the microcontroller .It will help us to move the robot from one place to another , that is when the chef gives the command it will carry the food from the kitchen and will move to the table according to the instruction.

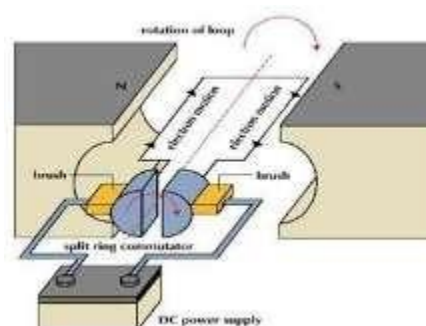


Fig.3 DC Motor

d. LCD MODULE

It stands for Liquid Crystal Display. It is the common device which is attached with our microcontroller to display the content on its screen. The working of the LCD in our model is to display the command which are given to the controller i.e.it will display that model is moving left or right, forward or backward and it will also show the distance calculated by the controller that how far any object is from the model.



Fig.4 LCD Display

e. ULTRASONIC SENSOR

It is a type of module which has two heads. One head is Transmitter and other is the Receiver head. The transmitter section transmits the ultrasonic wave and when the object will come in front of it , the wave strikes the object and the receiver will receive that wave .The speed of the transmitted wave and the receiving wave is equal to the speed of light. It will work as an obstacle detector in our model . When any object or table will come in front of it , our model will get stop at a particular distance.



Fig.5 Ultrasonic Sensor

CIRCUIT DESCRIPTION

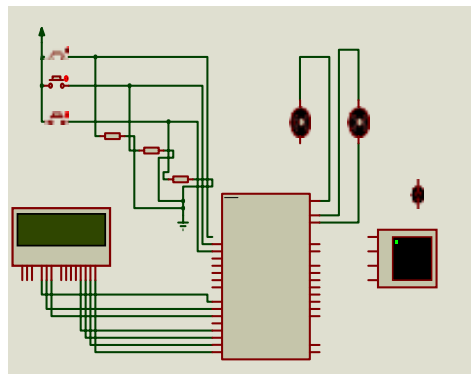


Fig.6 Circuit diagram

This is the circuit diagram of proposed model in which we have used AVR microcontroller to control the system. We have also connected some different types of input and output module according to our requirement which will perform different types of tasks .We have connected the bluetooth module and buzzer with the controller using USART feature .We have also connected ultrasonic sensor and IR sensor to run the motor.

Firstly the customer will order the food using an app which is developed by using python programming language ,which will show the menu of the restaurant .

When the command is given by our smart phone to the robot with the help of Bluetooth module,it will

move according to it by following the line follower path and deliver the food on the respective table.

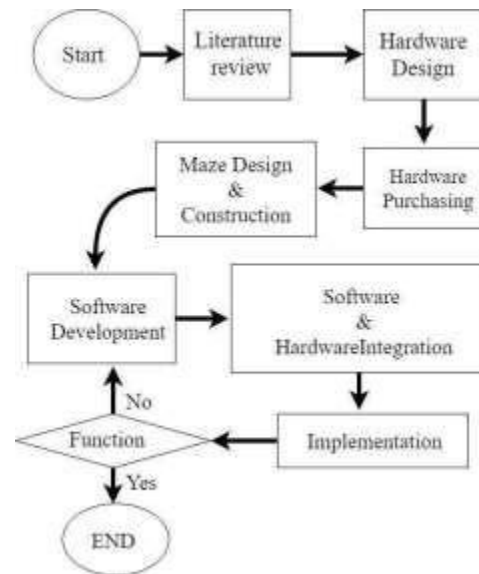


Fig.7 Design Flow chart

This block diagram shows that how we have made this or model. Firstly we have started the project by taking the literature review of the project, then we have designed the hardware part and after designing we have purchased the parts which have use in our project. After purchasing of the project we have done maze design and construction part.

The next step after designing of hardware part is to design the software which will show the menu of the restaurant and will help the customer to order the food. After all we have integrated the hardware and software part and then do the implementation .If it is working properly then it is good .If it is not working properly then we have to check again the software part.

ADVANTAGE

- Save the customer’s waiting time.
- It is a system of one time investment .
- It can work faster than the human do
- As the customer place the order by their own with the mobile or system ,the number of staff can be reduced.
- Robots will work for long time without paying extra charges for it.

RESULT

This is the screenshot of the software which we have developed to order the food. It contain the menu of the restaurant from which it is easy for the

customer to order the food from their smart phone without wasting the time to wait for the waiter .After ordering the food our screen will get shared by the chef using team viewer app and he will start to cook the food which the customer has ordered Once the customer has ordered the food, at last it will show the bill on your screen that how much you have to pay for your food.



Fig.8 Software Display

After the food gets prepared the robot which we have designed will receive the food from the kitchen and according to the instruction given by the chef it will serve the food on the respectable table by following the line follower path. When it will reach on the table the buzzer will start to beep and when the customer take the order from the robot, the robot will wait for a minute (depends on the programming) and will return back from the table on the initial place



Fig.9 AVR Development board

This is AVR ATmega16 development board from which we have connected different types of Hardware components and done the connection of all the components as an input and output feature with a wire. After the connection we have loaded the program on this board which we have done with the boot loader to perform the task according

to our requirement. The total circuiting is done on this board.



Fig.10 Prototype of Robot

This is a prototype model of our proposed model which we have developed which has table like structure and will move by following its path to the table . It will move with help of chassis which have four connected with it, which helps the robot to move .

FUTURE SCOPE

- We will try to provide a touch screen system at every table so that the customer can easily order the food from their respective table.
- We will try to use image processing to detect a particular table and serve the food.
- We will try to save to control the intelligent system through IOT.
- We will try to manage the robot in other fields of work like hospitals and libraries by small change in the programming.

CONCLUSION

As we are seeing that the use of the robot are increasingly day by day and becoming a part of our daily life and we are becoming dependent on them. This system allows the customer to order the food using an app which is programmed by python programming which is wirelessly connected via team viewer app.

We have designed a line follower robot which follow the line and place the order from counter to the customer table. We have tried to implement the robotic table from the existing appliances which could be use by elderly people or disabled people for house service. Such type of system is designed to work in many other fields like hospitals ,libraries and in defense areas with the small change in programming language .

In this paper “Serving management system”, we have developed Hardware and Software part. In hardware part we have made a robot which have table like structure which helps in serving the food on particular table and we have also developed python software which help to manage the canteen and it also helps in selecting the food of the customer’s choice.

We try to solve the real life problem of canteen and restaurants in a very effective way We have also reduce the cost of food by replacing man power with a serving robot.

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