Counterflow Robot for Restuarents

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Abstract—This project focuses on the movement of a robot in identified locations based on the Bluetooth module. It is designed such that it can be used in restaurants to serve the customers without any manpower requirements. It reduces the time required by a human server to serve the customer. In this project, the robot consists of a Bluetooth module. User will be provided with a mobile application in which the user can get connected to the robot. After enabling the connection the robot identifies the table number, then the user can order the required food through that mobile application. After the completion of the order, the robot delivers the food to the corresponding table.

I. INTRODUCTION

Latest trends in technology created a huge number of mobile robots in variety areas in various applications like cars,robot vacuum cleaners,unmanned ground vehicle etc. The movements of the robots is designed independently in environment with other robots comparatively.The future development in these projects can help the society in anonymous situations. Thus it has become the emerging field int the research category. On can perform research activity in various forms of applications in our day to day life.

The major research can be performed in the interaction of the robots in the dynamic environment. The approaches of research are broadly classified into microscopic and macroscopic. Microscopic models deals with its own characteristics whereas Macroscopic deals with the individual pedestrians without their characteristics. Microscopic models holds the major interest for implementing the movements of robots and designing them.

This project is related to the advancement in the technologies that are existing in our day to day life. This work is related to the Counterflow robot that is used in the restaurants and guiding these robots with specific rules with their motion control. This project describes the motion of the robot that can be used in the various places i.e to move the robot to the identified locations based on the Bluetooth model.

II. LITERATURE REVIEW

Thrunetal [1] described an model regarding collision free for mobile robots which are equipped with synchro-drives. He derives the appropriate version that is designed by robot trajectories and finite sequences of circular arcs based on motion equations. The approach of this model can be considered by controlling the steering command. This results in search space trajectories in two dimensional.

Shiowetal [2] discussed the improvement in the mobile robots standards which can deploy our future. The key factor behind all the inventions deals with the collision free environment and interactive mobile robots. Efficient method to plan a collision free path for robots is defined by hanging and standing polyhedral objects.The defined algorithm make use of geometry theory to determine the collision paths.Stephane petty and Thierry fraichard [3] explains motion planning of robots in dynamic environment. The time taken for computing the motion is limited. The complexity can be provided by the motion planning. In real time situations the complete time estimation can be difficult.Borensteinetal [4] developed and implemented a new form for obstacle avoidance method. It is defined based on the Vector Field Histogram (VFH). It permits the robot to identify the unknown obstacles and avoids them using the steering methodology and moves towards the target. The method used in this model is based on Cartesian histogram grid in two dimensional models.

The construction of the Counterflow robot can be considered as the extension of the line follower robot. In the proposed method the usage of the IR sensor array plays a vial role in the project. The detection of the surface and the movement of the robot of the surface is done by these IR sensor arrays.The count of the number of tables is also done by using an IR sensor.Thus,by connecting all the required components to the Arduino board makes the construction of the Counterflow robot

III. PROPOSED METHODOLOGY

This paper focuses on the movement of a robot in identified locations based on the Bluetooth module. It is designed such that it can be used in restaurants to serve the customers without any manpower requirements. It reduces the time required by a human server to serve the customer. In this project, the robot consists of a Bluetooth module. User will be provided with a mobile application in which the user can get connected to the robot. After enabling the connection the robot identifies the table number, then the user can order the required food through that mobile application. After the completion of the order, the robot delivers the food to the corresponding table. The block diagram is displayed in the below figure

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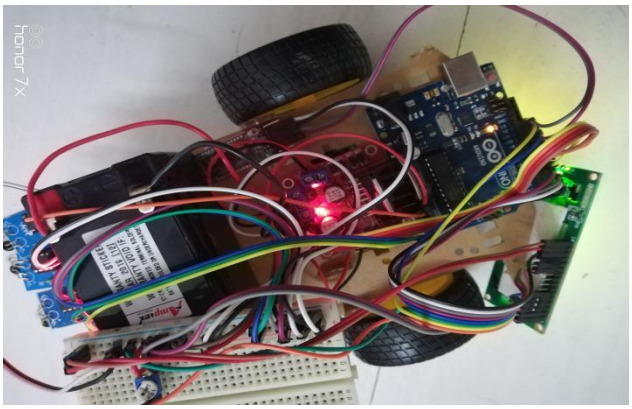
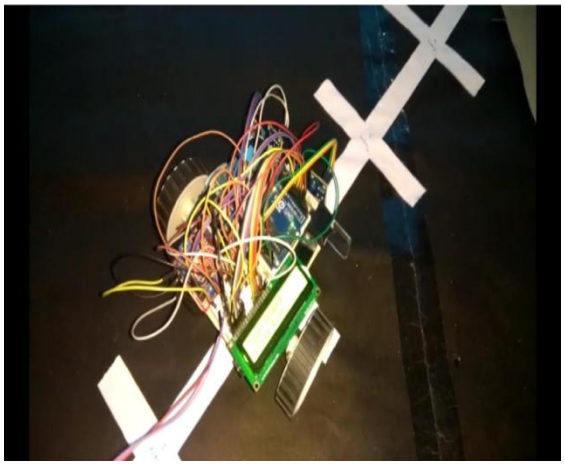
The hardware consists of an Arduino board which controls all the connections of the hardware model. The power supply to the board is given by using a 12V battery. Firstly, the chassis is prepared for the robot model which consists of two wheels and along with the dc motors. The power supply for these two wheels is also obtained from the same 12 volts battery. To make simpler the breadboard is used to provide the positive and ground connections required for the whole model. The HC05 module is used to connect to the Bluetooth devices.

IV. RESULTS

The expected outcome was achieved by the working model. The Bluetooth module gets connected to the mobile device and the user is able to provide the order using the numerical codes given in the coding of the robot program. The robot thus recognizes the table number and then serves the order to the respective table and returns back to its initial position.



After completing the order ,the robot moves to the respective table number.



V. CONCLUSION AND FUTURE WORK

In this paper,the basic movement rules and obstacle avoidance are monitored and analyzed with the previous methodologies. The major rules are found by the usage of respective IR sensors and the Bluetooth module. Further, these can be replaced for future investigations. The Bluetooth module can be replaced with the RF module for better long range applications. Additional researches on this model can be the next solution of upcoming projects.

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