

An Automated Robotic Restaurant

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Abstract:

As the technology is growing and it is been applied in all the fields and is being used in every aspect of life. As our life becomes busy due to work, we prefer to eat outside in some good restaurant to enjoy the food and to spend quality of time. Along with the good food a good environment is also required as the people demand. A modern restaurant can be equipped with robots or up to date new technologies. In our proposed project work, we are going to design a restaurant that can be controlled and services can be provided automatically using the modern technologies. In today's world the use of robot is going on increasing. Robots are able to carry out every work more effectively and efficiently than a man can do. Hence one of such application of robot could be SERVING ROBOT. There are many areas of research that could be done for a serving robot. We have used image processing to detect the old customer to recognize them automatically. Customers can access the menu sitting at the table itself and can place the order and the food is being served by the robot. In this paper we have try to demonstrate a prototype of Autonomous Serving Robot which will serve the food to the customer. The implementation is done with available resources to reduce the cost of project

Introduction:

Robot being a great advancement in the field of technology can serve well as a waiter at restaurants and hotels. With their time efficient and dedicated task performance robot can be a perfect solution in catering work. The traditional

way of serving comprises of a human waiter, who goes around the customer asking for the order. The main drawback of traditional human waiter is that it is very time consuming and employing a human can cost more as he need to

be paid for his service, also when they get sick the work suffers for the owner. We may think robot as a waiter may be a new thing but they have been serving our need since 1980's some of the existing example of robot can be Tanbo R1, Ken who served as an waiter in early 1980 at restaurants in Japan and many more similar examples can be given. In this paper we have proposed a robotic food way track which work on the technique of following an assigned coordinated path which is based on 2 dimensional axis that is x and y axis. The robotic tray carry the meal to the tables with their assigned area over a 2 dimensional path separated with x and y coordinate and stop at the point at which table is placed. A Bluetooth via order placing system is proposed in which customer can connect to the available Bluetooth address of the restaurant with their smart phones. An RF module used at the counter section of the restaurant help to guide the robot to the table number at which the meal should be delivered act as an remote control of the waiter robot.

In today's restaurant Digital multi-touch menu cards and other forms of digital facility are replacing old fashioned services like-waiters can take order from customer and serve them. Intelligent Restaurant system delivers almost infinite flexibility in promoting meal and snack options. Intelligent Restaurant system uses technologies innovatively in a modern restaurant such as multi-touch LCD with Arduino

mega, RF module, database & line following Robot to enhance quality of services and to enrich customer's dining experience. In many existing system a line following robot is designed using sensor operated motors to keep track the line path predetermined for meal serving. PayPal is used for online payment. If a person wants to give an order then he can call the robot by simply pressing a switch on his table. The whole system makes use of RF technology. Robot automatically checks the status of the person. It reaches the correct destination and person passes his order to robot. The robot sends the order by wireless technology (RF technology) to counter where a receiver is placed; this receiver receives the signal from the robot (through RF technology) and the person at the counter checks the order, prepare it and put it on the robot and robot again provides proper service to respective person automatically. The robot can take the order from multiple people by reaching near their tables on their call. The robot can serve to a customer as well as take order from another customer at the same time.

Problem Statement:

Robots can be divided in two main types. The first one deals with the teleported robots while the second one is autonomous robots. Teleported robot is remotely controlled and guided by a human operator who views and senses the environment through the robot sensors. Whereas, the autonomous robot has

multiple sensors to detect events and measure state information which is then used to apply control logic. The problem of restaurant automation deals with the design of a communication system and a waiter robot which can coordinate with rest of the players in the system.

Objective:

The objective is to develop a small scale robot, called the Serving Robot, which can help in the progress in the field of the robotic assistance technologies. A robot that functions as a personal assistant should be able to help in different environments, whether it would be a research lab, a hospital, or even at home. It would be able to deliver messages or items, project video and pictures, move and navigate on its own etc. The basic objective of the Serving Robot is to serve the customer effectively. It takes their orders and takes care of transporting food/refreshment to them.

Proposed system:

In today's restaurant Digital multi-touch menu cards and other forms of digital facility are replacing old fashioned services like-waiters can take order from customer and serve them. Intelligent Restaurant system delivers almost infinite flexibility in promoting meal and snack options. Intelligent Restaurant system uses technologies innovatively in a modern restaurant such as multi-touch LCD with Arduino

mega, RF module, database & line following Robot to enhance quality of services and to enrich customer's dining experience. A line following robot is designed using sensor operated motors to keep track the line path predetermined for meal serving. PayPal is used for online payment. In this paper we have made a robot which provides proper service to customer in restaurant. Customers can select the food items from the menu display on the table and place the order. The person at the counter checks the order, prepare it and put it on the robot and robot deliver the food to the respective table.

Existing System:

Traditional restaurant service is typically passive: Waiters must interact with customers directly before processing their orders. However, a high-quality service system should be customer centered; it should immediately recognize customer identities, favorite menus, and expenditure records to provide customer-centric services.

Advantages:

- Cost efficient
- Attract customers
- Error Free

Hardware Requirements:

Processor : Any
Processor above 500 MHz
RAM : 2 GB
Hard Disk : 80 GB

Android Phone
RC5 Decoder
Aurdino

Software requirements:

Operating system : Windows 7
JDK 1.8
Android SDK
IDE : Eclipse Kepler
Data Base : MYSQL
Server : Apache Tomcat
Server 7.0
Database Connectivity :
JDBC Sources (with MYSQL
Server)
Programming Language : Java
and Python

Impact:

1. Interaction

In the proposed system, an arena is used which consists of the black lines, LEDs and tables with switches. LEDs will be place on the path of robots. When the customer comes he will press the button on his table to get refreshment. As the button will be pressed (switch is on), the LED at the starting point and the LED at the junction from where robot will move to serve towards the table will glow. As the LED at starting point will glow the robot will initiate its program to follow black line. The robot will start following black line, when it will get a white light in the way it will stop and it will take the order from the customer and send it to counter. After the preparation of food it will come back and serve the food. After serving it will again follow

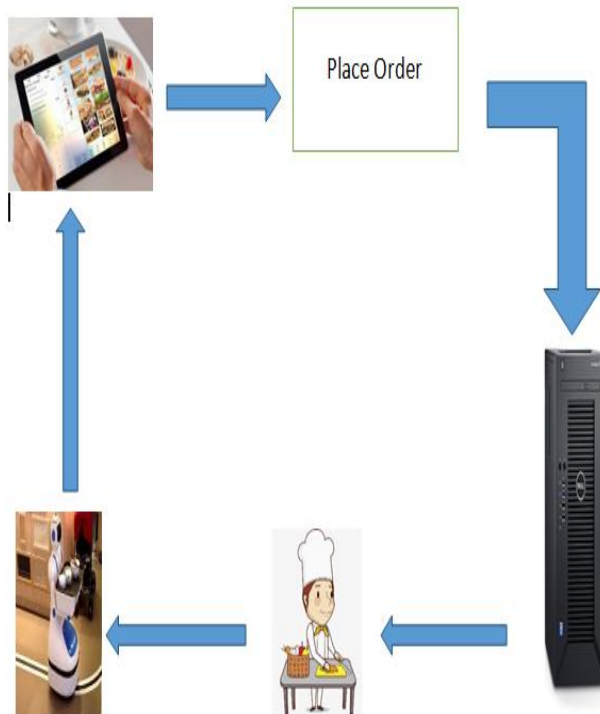
the returning black line path and come to the starting position.

2. Movements

Here, the robot which work on the technique of following an assigned coordinated path which is based on 2 dimensional axis that is x and y axis. The robot carry the meal to the tables with their assigned area over a 2 dimensional path separated with x and y coordinate and stop at the point at which table is placed. There may be several tables which are arranged in a specific way. This is done to provide a simple path to the robot.

3. Smart Menu

The customer and the waiter use software that runs on Android tablets. The system also includes a server which has the restaurant's menu in a database and all the information related to ordering logic. The devices are connected to a private and secured WLAN network. The menu can be created with desktop application specifically made for this. The customer's application works on a Android tablet-computer. The application is connected to the database server and downloads the restaurant's menu in real-time. The customer can browse the menu, check additional information about the items (e.g. nutrition, calories) and order items. The menu has descriptions, pictures and information about the food items.

Architectural Diagram:**Conclusion:**

The traditional way of serving comprises of a human waiter, who goes around the customer asking for the order. The main drawback of traditional human waiter is that it is very time consuming and employing a human can cost more as he need to be paid for his service, also when they get sick the work suffers for the owner. The main drawbacks of traditional waiter can be very successfully overcome with this system and is a great step toward the technological advancement of society today. Such types of robot system can also work in different areas of human societies like hospitals, libraries and restaurants with small change in programming areas.

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