

Autonomous E-Commerce Contactless Delivery Robot

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Abstract: *As the world moves towards new trends and technology, there is a desire to create something more appealing and beneficial for residents. This study focuses on a relatively new area of application and gives a complete review of robotics applications in the food and lodging industries. All occupations in this new technological age rely on a technique known as automation. Instead of human employees, fresh research works are being generated in the market as the trend and new interest nowadays. In this framework, we explore the notion of Food Serving Robots (FSR) or other hotel-related items. It was built using Arduino boards and the Arduino IDE. The board is predefined in this project work by employing an ultrasonic sensor, a camera, and a microcontroller.*

Keywords: Food serving robots (FSR), Automation, IR obstacle sensor, Internet of Things mechanisms (IoT).

I. INTRODUCTION

Currently, the Internet is expected to play a significant role in everything; new techniques are emerging in the general population to maintain precision while eliminating manual labor at a low cost. The Internet of Things is one of the moving plans to make a couple of systems as motorization and can decrease the number of human undertakings in every area, alongside this robot making and using the robot in the dares to replace the human undertakings is one of the huge thoughts. While investigating the food industry, robots fill a significant need, primarily in the service of food [1],[3]. The evolution of computerized applications in the food business grew, but it was not accessible due to expensive development charges.

Industry leaders have invested resources in cutting edge mechanics and automating developments in a push towards greater Significant capabilities and scale to tackle the concerns of what could be in the future. Fertilizer, fertilizer, collection, and duplicating structures are a few fundamental areas of advancement. Lessening production costs and monitoring water, fuel, and manure are the main focuses of these cooperative redesigns [3]. A huge number of these headways are not only helpful, but they also provide jobs. Gathering robots that can cover the areas of many personnel have been utilized by some fantastic commercial businesses. Robots fundamentally might potentially change the cycles in food planning and managing, food serving. Thus, progressing years saw enormously extended example of robot game plan in food region. Food serving industry is the most forward-thinking approach of robots use in food industry. This is the most imaginative locale not tapped totally as of not long ago. As this directly oversees retail and buyers, thusly, it is seen as an astounding change in life style including a donning development and therefore expects watching out for the thoughts of human structure mix. Food serving industry is the most forward-thinking approach of robots use in food industry. This is the most imaginative area not tapped totally as of recently [9],[11].As this directly oversees retail and buyers, Robotic systems have the ability to profoundly alter the cycles of food preparation, management, and service. Hence, the use of robots in the food industry was further expanded as time went on. The most innovative usage of robots in the food business is in meal service. This is the most creative area that hasn't yet been fully utilized. It is expected to be watched for the ideas of human structure mix since this directly affects retail and shoppers. It is also viewed as a significant development and an incredible alteration in lifestyle. The most innovative usage of robots in the food business is in meal service. This is the most creative sector that hasn't yet been fully explored [9],[11]. This directly supervises buyers and retail; Therefore, it is perceived as a radical change in lifestyle, including a sport.

Particularly, we are focusing on the serving of the food in accordance with the instructions of the client, when the food is placed on the robot that is moved to the relegated way and arrived at the table that has already been altered or trained. Once the robot is stopped at the designated table, the client can use the ringer that is contained in it. The signal emits sound until the customer receives food from the robot [13]. Using this tactic, fewer human interaction and hand meal preparation are avoided. The progression and related expectations call for keeping an eye out for the opinions

II. LITERATURE SURVEY

Internet of Things (IoT)-based Design of an Automated Contactless E-Commerce Delivery Robot by Huang et al. The concept of an IoT-based automated delivery robot that can autonomously travel across metropolitan settings and contactless deliver items to clients is proposed in this study. (2) Zhang et al” Smart 's Delivery Robots for Last-Mile Logistics: A Complete Study.” The state-of-the-art in intelligent delivery robots, including contactless e-commerce delivery robots, is thoroughly reviewed in this paper. The report assesses several delivery robot varieties and analyses the major technological difficulties in the area. (3)

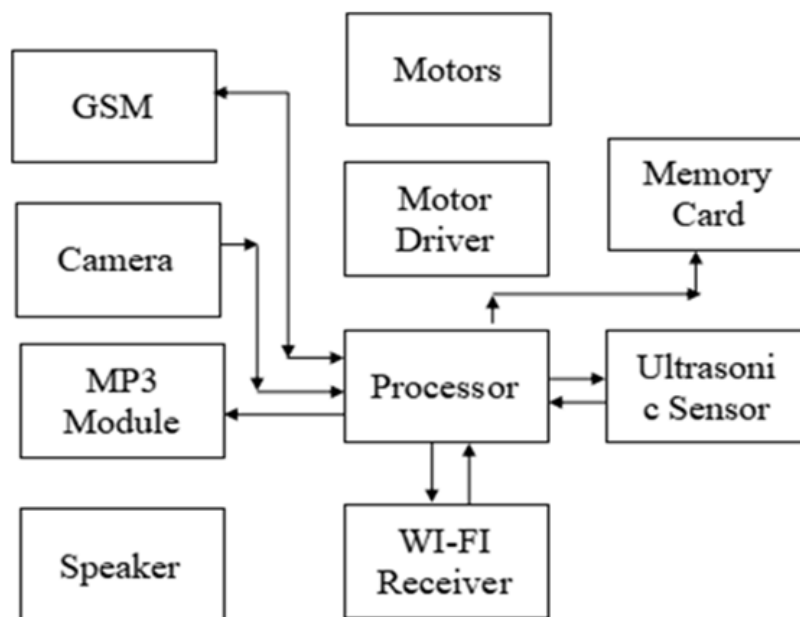
By Park and others, "Design of a Contactless Delivery System Using a Robotic Arm for E-commerce." In this study, a contactless delivery system based on a robotic arm is suggested for use in e-commerce applications.

Through simulations and experiments, the study assesses the system's efficacy. (4) Wang and colleagues' "Design and Development of a Contactless E-commerce Delivery System based on the Robot Operating System." The delivery robot is controlled by the Robot Operating System (ROS) in this study's proposed contactless e-commerce delivery system. Using simulations and tests, the research assesses the system's efficacy. (5)

By Hu et al., "An Automated Delivery Robot for Smart E-commerce Logistics." The concept of an autonomous delivery robot is suggested in this study for clever e-commerce logistics. Via simulations and trials, the research assesses the robot's efficacy. (6)

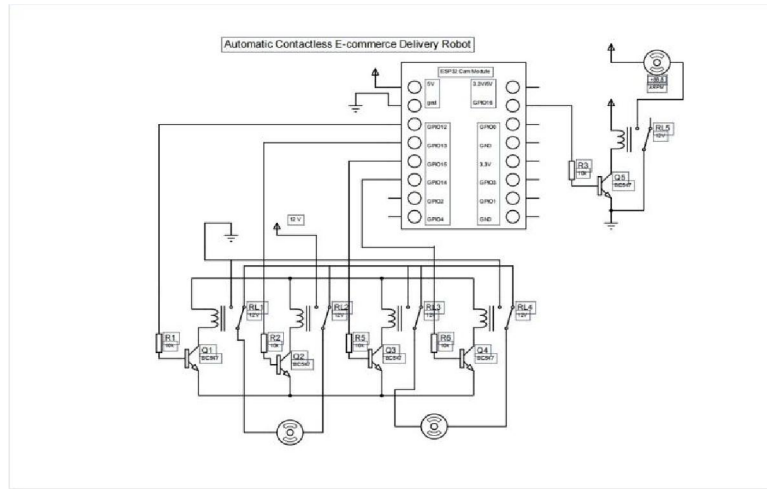
These studies show that autonomous contactless e-commerce delivery robots have the potential to enhance last-mile logistics and increase the effectiveness and convenience of e-commerce for consumers. To fully fulfil the promise of these robots, several technological and logistical issues still need to be resolved.

2.1 Block Diagram





2.2 Circuit Diagram



2.3 Hardware Specification
Arduino Board



ESP32 Cam



Motor Driver



Keypad

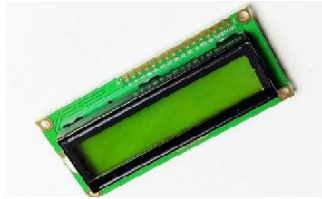


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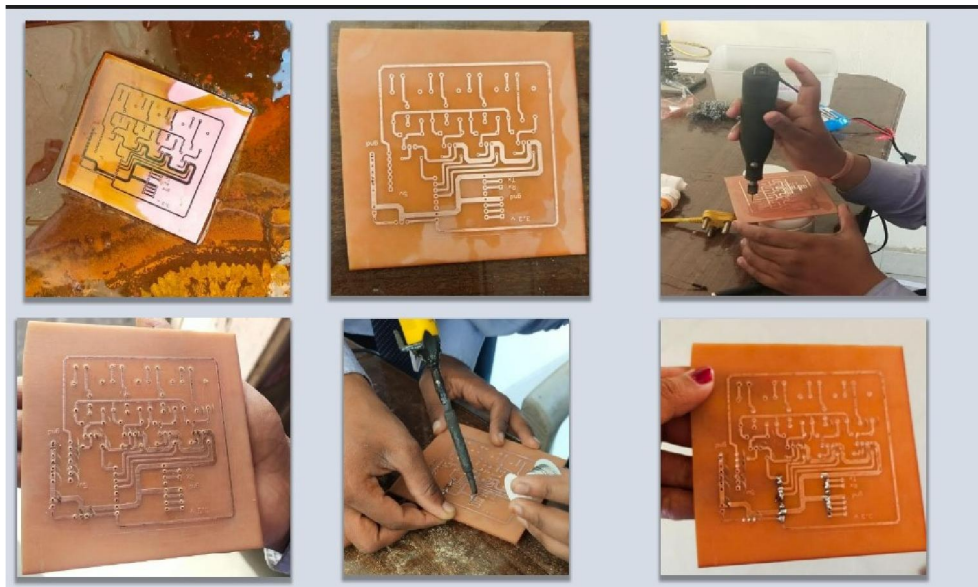
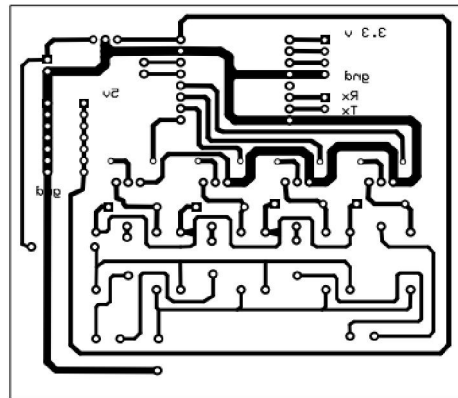
LCD Display

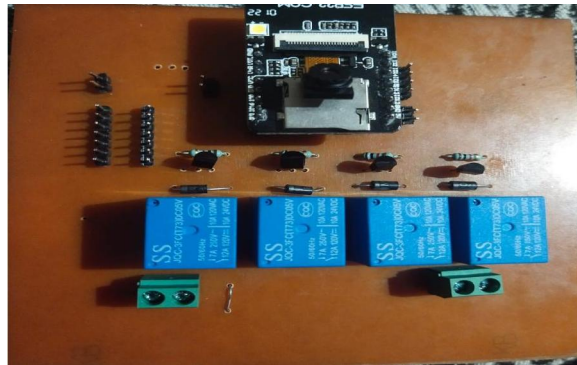


Jumping Wires

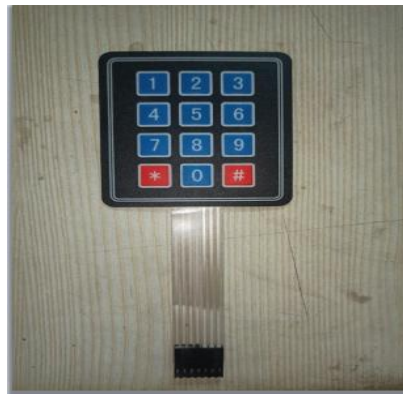


PCB Layout





Keypad



Software Specification

- Arduino IDE Compiler
- HTML Coding

Advantages

- Reduce the Physical Strain on wait staff by taking over the menial labour tasks.
- This leaves Human staff with more energy at the end of the day.
- Less pressure at work leads to higher job satisfaction among staff.
- It Increase Staff Retention.
- Speed - Robots don't get distracted or need to take breaks.
- Job Creation.
- Perfection.
- Safety.

III. CONCLUSION

The food serving robot for contactless experience is the thorough cutting edge uncovers that the space of mechanical technology has unbelievably accelerated the efficiency whilst contrasted with the guide introduction frameworks. It's far featured that the food serving area has the most important capability of innovative paintings. The robot system can work consistent with the pre-described programming within an assigned time, while once the meals can items can be positioned inside the pinnacle of the robot it is able to be moved to the assigned table that's managed via the user, and it could make the sound until the food acquired from the patron inside the table. Concerning this the proposed device of the food supply robotic can make the meals serving approach for the lodges/restaurants easy. this approach can keep away from the guide system of food serving device as well as it could lessen the personnel work with the aid of making the procedure easy.

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