Social Delivery Robot Using Raspberry pi

https://www.youtube.com/watch?v=TRxJhbu-74o

The Social Delivery Robot using Raspberry Pi is an intelligent autonomous system designed to deliver items while interacting seamlessly with its environment. The robot uses a Raspberry Pi 3 as the central control unit, integrating multiple sensors including an SR04 ultrasonic sensor for obstacle detection during movement, an IR sensor, a rain sensor to control the door mechanism, and a GPS module for location tracking. The system incorporates a Pi Camera for live video streaming and QR code scanning, enabling the robot to identify and manage orders represented by distinct QR codes (earphones, speakers, laptops, smartphones).

The robot's mobility is controlled via DC motors driven by an L298 motor driver, with an additional motor managing the door's opening and closing based on rain sensor input. A speaker provides voice alerts to enhance interaction and safety. The robot is powered by a rechargeable battery regulated by an LM2596 voltage regulator and supported by a charging circuit.

while moving forward, when the robot detects obstacles or rain, it sends SMS alerts with the current GPS location through a GSM module, ensuring real-time updates to the user. The system features a web interface that allows users to start the robot, initiate QR code scanning, view live streams, and monitor order count and serial numbers dynamically as the robot scans items during delivery.

This design highlights the integration of Raspberry Pi with sensors, communication modules, and web interfaces to develop a low-cost, efficient, and socially interactive delivery robot suitable for indoor and controlled environments.

Objectives:

- Integrate Raspberry Pi 3 with sensors such as ultrasonic, IR, rain sensor, and GPS for navigation and environment sensing.

- Implement a Pi Camera for live streaming and QR code scanning to identify delivery items.
- Control DC motors for robot movement and door operation using an L298 motor driver.
- Develop a communication system using GSM to send SMS alerts with location in case of obstacles or rain detection.
- Create a web interface for remote control, live monitoring, QR code scanning activation, and order management.
- Ensure power management with a rechargeable battery and charging circuit.

Components used:

- Battery.
- Raspberry Pi.
- Pi Camera.
- IR Sensor.
- Ultrasonic Sensor.
- GSM.
- GPS.
- Speaker.
- Rain Sensor.
- L298 With Dc Motors.
- Door.
- SD Card.
- Charging Circuit.
- LM2596.

Software's used:

1. Express SCH for Circuit design.
2. Raspbian OS, Python language.
3. Web technology.

Block diagram