

Rent Out Your Parking Space- Automated Car Parking System

This IoT project automates car parking, allowing users to rent out their parking spaces seamlessly. The system utilizes an ESP32, an OLED display, an ultrasonic sensor, a barrier mechanism, and PayPal integration for payment. Below is an overview of the project's functionality:

Project Features

1. **Initial State:**
 - Upon powering up the system, the barrier is closed.
 - The OLED display shows: "Paid parking, press button to open (barrier), pay while leaving using PayPal."
2. **Opening the Barrier:**
 - When the button is pressed, the barrier opens.
 - The OLED display shows: door opened, park car, press button to close."
3. **Parking the Car:**
 - As the barrier opens, the user can park their car.
 - After parking, pressing the button again will display a QR code on the OLED and close the barrier.
4. **Paying for the Parking:**
 - Upon returning, users must scan the QR code to access their car.
 - Scanning the QR code opens the PayPal interface, requiring a \$1 payment.
 - Upon successful payment, a Webhook sends a notification to the ESP32.
 - The OLED displays: "Payment successful, opening door, take out car," and the barrier opens.
5. **Removing the Car:**
 - The OLED suggests the user remove their car from the parking space.
 - The barrier remains open until the ultrasonic sensor detects that the car has left (distance greater than `distanceRange`).
 - Once the car is removed, the system resets to its initial state, and the barrier closes.
6. **Resetting the System:**
 - When the project is in its initial stage, the barrier can be accessed using the push button.

Installation and Setup

1. Upload the provided code to the ESP32.
2. Ensure all hardware components are correctly connected.
3. Configure the PayPal integration and Webhook for payment notifications.

Usage

1. For Parking:

- Press the button to open the barrier and park the car.
- Press the button again to close the barrier and generate a QR code for payment.

2. For Leaving:

- Scan the QR code to access the PayPal payment interface.
- Complete the payment to receive a notification on the ESP32.
- Retrieve your car once the barrier opens.

Hardware Components

- ESP32
- OLED Display
- Ultrasonic Sensor
- Barrier Mechanism(Servo motor)
- Push Button
- Internet Connection

Software Components

- PlatformIO
- PayPal Integration
- Webhook Configuration