Smart Parking System

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Project Description

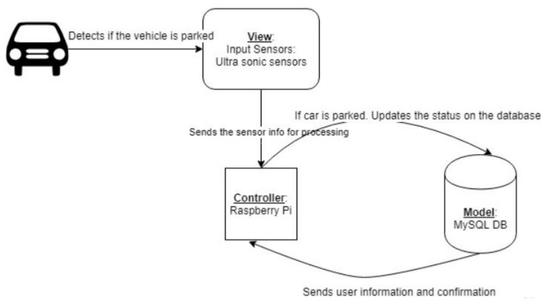
Our team created a smart parking system that detects full and vacant parking bay spots.

Many people have important obligations to attend to; our smart parking system is a reservations-only system that allows for hassle-free parking spot booking. This system also mitigates the issue of parking fee evasion - an issue that is very common is most universities and paid parking lots/garages.

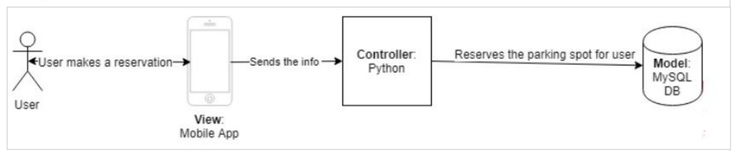
We are well aware of the adage “time is money”; our users may rest easy knowing that they will be guaranteed a spot to start their day.

System Architecture

Main Application:



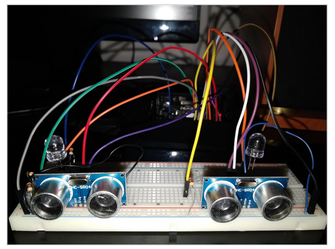
Companion Mobile Application:

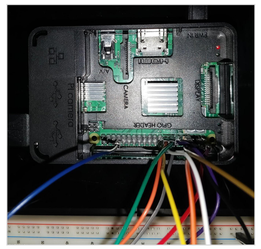


Implementation Details

Hardware:

- Ultrasonic sensors (HC-SR04)
- Raspberry Pi Model 3B+
- LEDs for visualizing vacancy





Software:

- Python as controller module
- Android Studio for mobile app (Java, XML)
- Flask web framework with Python
- PostgreSQL for database storage

Application Domains & Use Cases

A potential alternative application for this system could be a smart seating system for colleges, universities, and libraries.

The ultrasonic sensors could be placed underneath desks facing the direction of users/chairs to detect if someone is currently occupying that spot. Wireless modules can be wired to the sensors to communicate with Raspberry Pis placed somewhere within range.

A seat usage map can be generated and a feature for booking private study spaces/rooms can be implemented.