DOCUMENTATION

Team SL

14th June 2023

1 Team Members

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2 Introduction

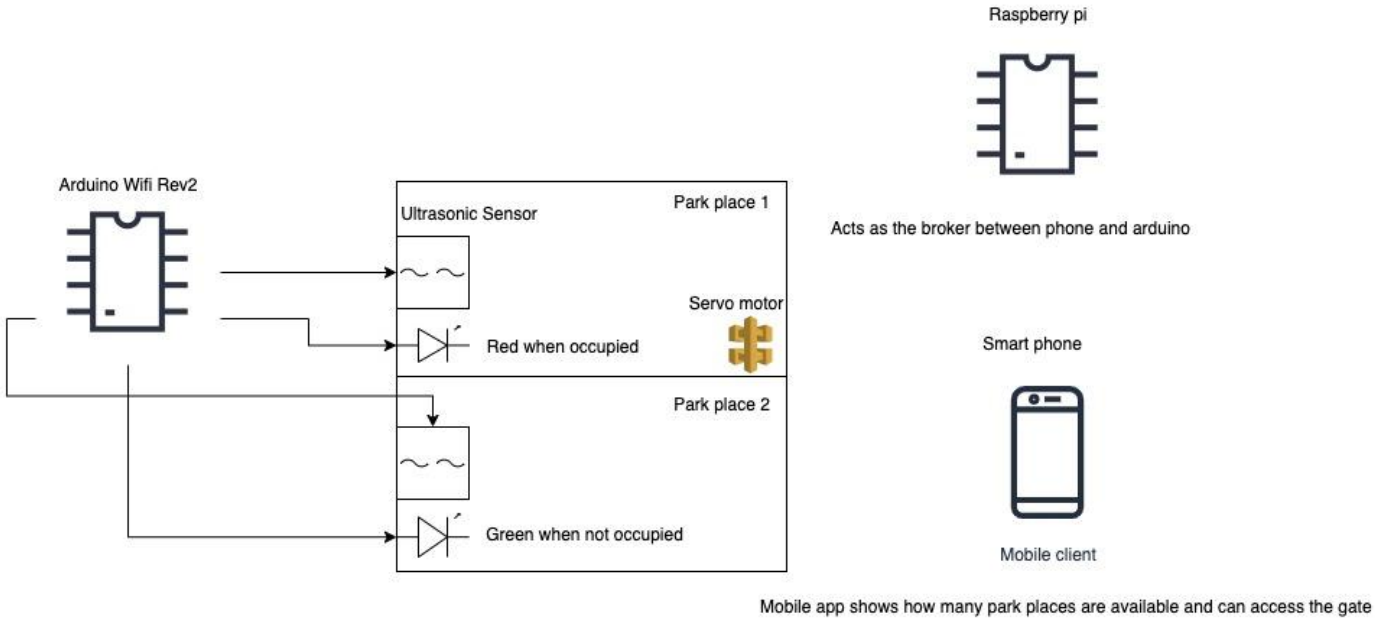
MQTT(Message Queuing Telemetry Transport) is an efficient communication protocol that is designed for IoT devices and applications. It is widely used for real time data exchange and connecting devices over networks.

MQTT operates on a publish and subscribe messaging model. The publishing device can publish messages while the subscribed device can receive the messages.

To connect to a phone using MQTT you need an MQTT broker device which acts as the hub for message routing. The phone that acts as a subscriber connects to the broker and subscribes to specific topics of interest. The other device that acts as the publisher also connects to the broker and publishes messages on the specific topic. When a message is published the broker device forwards that message to all the subscribed devices that are interested on that topic.

In our project we are using this communication protocol to get the data from arduino wifi Rev 2 to our mobile application. In our project Raspberry pi board acts as the Broker and the publisher is Arduino Wifi Rev 2 and the subscriber is our mobile application. Simple overview of the project is, we are making a smart park where the user can check the availability status of how many free parking spaces there are and control the park gates with a smartphone application. We are using 2 ultrasonic sensors, raspberry pi board, arduino wifi rev 2, servo motor, and RGB light as our main electronic compartments. As for the mobile application we are using the IoT MQTT panel for our project.

3 Concept Description



Main application in our project is to help the user to get real time information about the car park and access the car park remotely.

For our project we are using - 2 Ultrasonic sensors (Sensor)

Servo motor (Actuator)

RGB light (Actuator)

Arduino Wifi Rev 2 (Device)

Raspberry Pi (Device)

IoT MQTT Panel (Application)

4 Project/Team Management

In managing tasks within our project, we followed a organized approach to ensure efficiency and productivity. Firstly, I begin by clearly defining the project goals and objectives, breaking them down into smaller, manageable tasks. This helps me prioritize and determine the critical path for the project. I then create a detailed project plan, outlining timelines, dependencies, and milestones. Utilizing project management software, I assign tasks to team members, ensuring each person's responsibilities align with their skills and expertise. Regular communication and progress meetings play a vital role in keeping everyone informed and addressing any challenges or roadblocks promptly. To stay on track, I regularly monitor the project's progress, tracking key metrics and adjusting timelines or resources as necessary. Finally, I maintain flexibility and adaptability, making sure to reassess priorities and adjust plans whenever unexpected changes or issues arise. By employing this structured approach, I effectively manage tasks, fostering collaboration and ensuring the project's successful completion.

Team members task

- **Ravindu Athukorala :-** As a part of the project the role was to develop communication and implement connection with Raspberry Pi Broker Using MQTT. Two arduinos were used in this project. One arduino acts as a publisher which sends the sensor sampling data to the broker using mqtt and other arduino is used as a Subscriber which receives data from the broker inorder to activate the actuator.

- **Kajeepan Umaibalan :-** the role was to install the operating system and mqtt application on the Raspberry Pi. made mqtt configuration to configure the raspberry pi as a broker. And made communication with smartphones for data visualization. The smartphone also acts as a publisher and subscriber.

- **Dapsara Kapuge :-** In the project, the role was to code and configure the Arduino IDE to set up the sensors and read data. I utilized the Arduino programming language and IDE to write the necessary code for sensor integration. This involved initializing the sensors, setting up appropriate pins and communication protocols, and implementing data reading algorithms. Through this role, I ensured the seamless integration of sensors into the Arduino platform, enabling accurate and reliable data acquisition for further processing.

5 Technologies

As applications we used Arduino IDE,Putty terminal,IoT MQTT Panal,

6 Sources and References.