# S-CAR

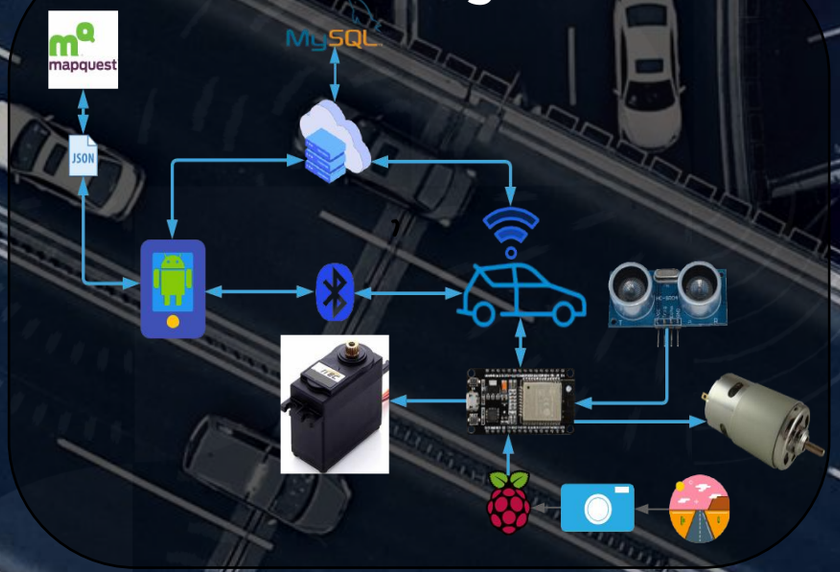
## What is S-Car

Self-Driving Car (S-Car) is a vehicle that can drive between destinations, avoid objects and take decisions without a human operator. Self-driving cars are a great improvement in the automotive world as they help us to save our environment by eliminating CO2 while using renewable energy.

## Software

- Android studio is used to develop the app
- Tomcat is used to create the server in java
- Map Quest API is used to view the map & to get an address coordinates
- SQL database to store drivers & car details
- PyCharm is used to write & test the lane detection code
- FreeRTOS Tasks & Event group to speed up the code execution on the ESP32
- OpenCV is used to extract the lanes from the camera

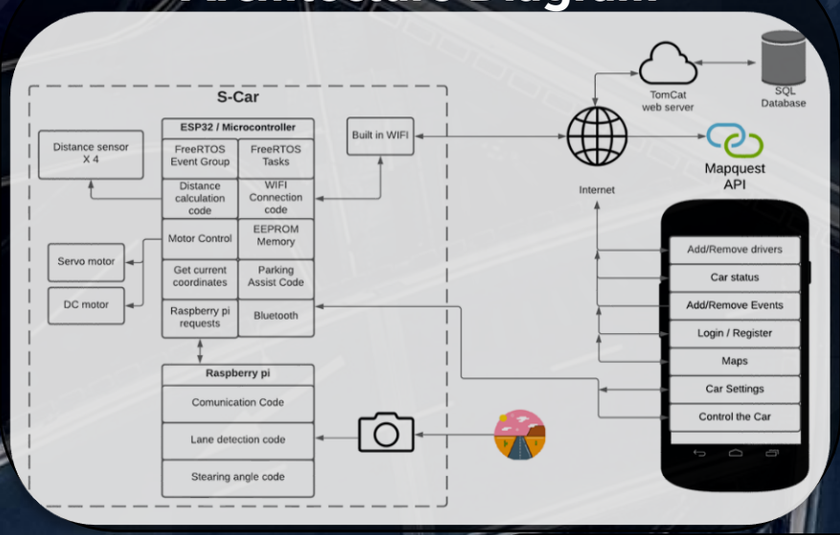
## Block Diagram




## Hardware

- Ultrasonic sensors is used to get the distance of the objects around the car
- ESP32 is used to control the car & to handle the App requests through Bluetooth
- Raspberry Pi & camera are used to read the roads & provide ESP32 with the lanes data
- DC motor is used to drive the car
- Servo motor is used to control the steering
- RC car chassis used to put all the components together
- ESC used to control the DC motor speed

## Architecture Diagram




## S-Car Features

- Android application
  - Add/Remove Drivers
  - Add/Remove Events
  - Maps
  - Control car through Bluetooth
  - Cloud storage
- Advanced lane detection
- Parking assist
- Auto braking system
- Autonomous driving
- Calendar sync

## Results

S-Car is fully functional. It can park its self without any hard coded values, it can drive using computer vision. Android application is fully working.


Mohamed Otaki – G00346067

Michelle Lynch – Supervisor

Bachelor of Engineering (Honours) Software and Electronic Engineering

GMIT
INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO
GALWAY-MAYO INSTITUTE OF TECHNOLOGY