Team Name

OOHeaven

Members

- Rishabh Chaturvedi
- Mitul Tyagi
- Parikshit Hooda

APTrack

Objective - To make user aware of air pollution his vehicle uses and give him solutions to reduce it.

A webapp using Firebase and Ionic framework using an ‘arduino + bluetooth’ solution to fetch exhaust gases data to the driver’s mobile which will be analysed for pollution.

If the vehicle was functioning at optimal level and was at a good rank, he would be rewarded else he would be sent a notification to repair the vehicle. If the vehicle isn’t repaired, it would be reported to the Police and Central Pollution Control Board.

Objective

To make user aware of air pollution his vehicle uses and give him solutions to reduce it.

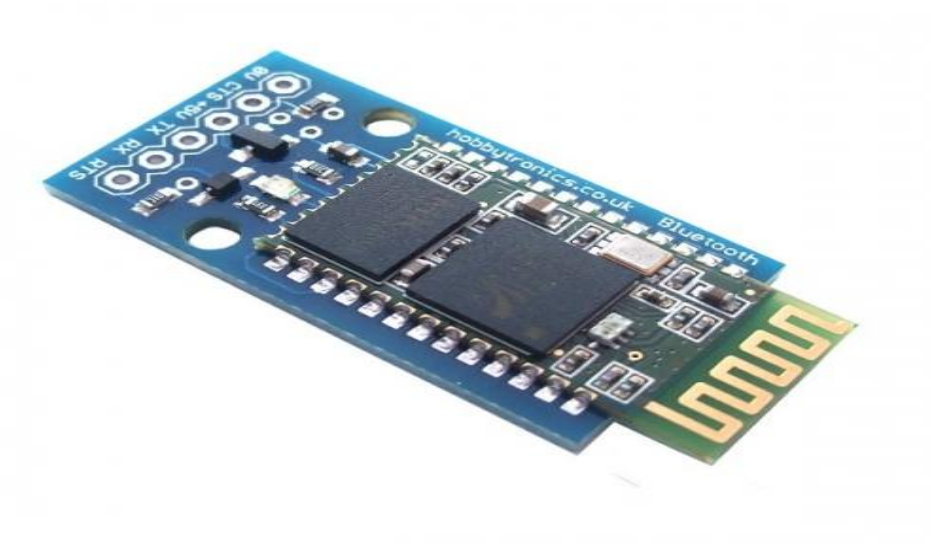
Technology and Frameworks used

- Firebase (backend framework)
- Angular (application framework)
- MQ7 sensor(as a gas sensor)
- Bluetooth module(to transfer gathered data to driver’s mobile)
- Arduino uno (to control sensor and bluetooth)

App components

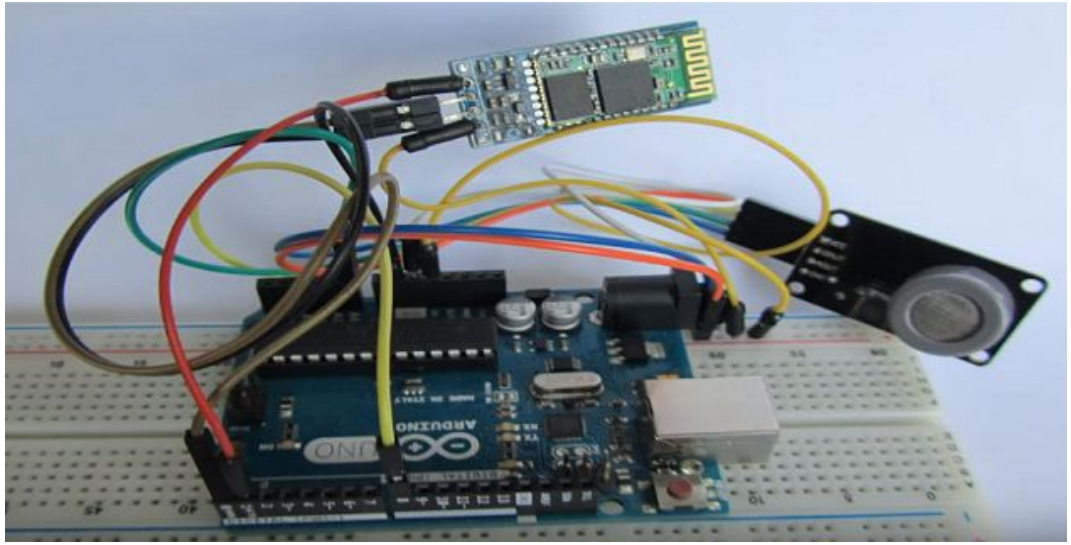
- Local Leaderboard, which may comprise of a particular locality or can encompass a whole town
- Signin/Signup interface for users and drivers
- Dashboard page for an overview
- Analysis page
- Interface to start a ride and stop

Arduino uno



Bluetooth module

Mq7 sensor



Arduino uno, bluetooth module docked on bread board

Sensor data

- Vehicular emission standard - Bharat Stage - IV (4)
- Sample data received from sensor - CO value : 50 ppm (parts per million per second)
- CO g/ km to CO ppm = 9.66 * (10 ^-1) . (conversion factor used)
- For passenger cars, permitted emission for CO is - 1.0 g/km (0.966 ppm/second)
- Considering the speed of the car to be constant at 40 km/h (for calculation's sake),

Time taken to drive 1 km = 90 seconds. Pollution caused = 90 ppm(disregarding all other factors contribution to pollution like engine inefficiency.)

Permitted pollution level allowed = 96.6 ppm

Future plans

- Tie-ups with company like paytm, freecharge, pvr cinemas, restaurants to create a rewarding system for best performers.
- Get Central Pollution Control Board on the platform
- Push for BS-V norms for less pollution using the platform
- Reduce the cost of the hardware to install(arduino) so that it is economically feasible and durable
- Conduct research to get a more comprehensive analysis of the pollution caused by taking into account other components too like Hydrocarbon pollution, Nitrogen gases based pollution, particulate matter based pollution.
- Push for cleaner fuel technology.

Knowledge supplements

Arduino

The Arduino UNO is a widely used open-source microcontroller board based on the ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.The board features 14 Digital pins and 6 Analog pins. It is programmable with the Arduino IDE(Integrated Development Environment) via a type B USB cable. (Arduino Uno, Wikipedia)

Firebase

Firebase is Google's mobile platform that helps you quickly develop high-quality apps and grow your business.

Firebase

Angular

Angular is a TypeScript-based open-source front-end web application platform led by the Angular Team at Google and by a community of individuals and corporations.