

Registration Details

Technology Bucket: Smart Communication

Category: Software

Company Name/ Ministry Name: ARAI

Problem Statement: Automated Adverse Road Condition Detection

Problem Code: UK1

Team Name: BroCode\$

Team Leader Name: Vanitha Kunta

College Code: 1-3516041250

Idea Details

Objective: Human life is priceless and it is the most valuable asset in the world. Almost 70 percent of Indian population utilize roadways to commute. Adverse road conditions are created as a consequence of potholes, speed breakers, oil spills etc. These can lead to accidents and result in loss of human life.

Proposed solution: The proposed system architecture consists of the following:

Hardware: The below described sensors are connected to an arduino mega. The whole setup is presented to the user as a gadget which can connect to the application running on a smartphone.

- Sensors
 - Accelerometer
 - Gyro sensor
- Bluetooth Module
- Arduino Mega

Software: The proposed software to address the problem in hand is a combination of an algorithm running on the Arduino and a Mobile Application which runs in two modes.

a) Mapper Mode:

- The algorithm running on the Arduino board continuously keeps monitoring the sensors data and performs analysis for abnormalities.
- Whenever an abnormality is detected the board sends a message which describes the abnormality to the mobile application via the bluetooth module.
- Similarly the previously detected abnormalities at that location are rechecked and verified in the future.
- Potholes and speed breakers can be detected by accelerometer when it detects sudden change in the acceleration of the vehicle in a particular dimension that is mounted accordingly.
- Similarly oil spills can be detected using gyro and accelerometer as the vehicle tends to skid leading to abnormal angular and linear acceleration.
- Once a message is received by the smartphone via bluetooth it tags the message with its current location and uploads this information to a centralised database.

2) Navigation Mode:

- The database is scrapped for locations and type of abnormalities by the mobile application, then this scrapped information is tagged on a map interface.
- The above tagged map interface is presented to the users in this mode around his current location.

Technology Stack:

Frontend: React Native, Mapbox(for maps)

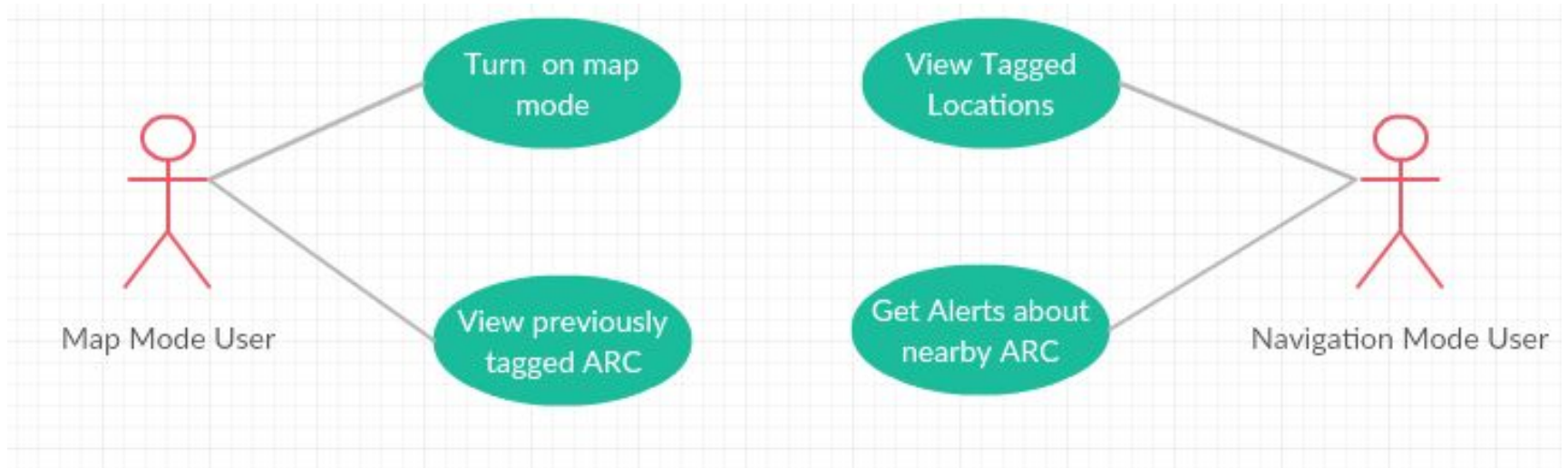
Backend: MongoDB / Firebase, C++(arduino programming)

Hardware: Arduino ATmega 2560, Sensors and Modules.

Dependencies:

- Arduino ATmega 2560.
- Sensors(Accelerometer, Gyro, etc.) and Bluetooth Module.

Approach Details



- ARC - Adverse Road Condition