Idea/Approach Details

Technology Bucket : Smart Communication
Company Name : ARAI
Team Leader Name : Shrey Jasuja

Category : Software
Problem Code : UK1
College Code : U-0841

Proposed Solution

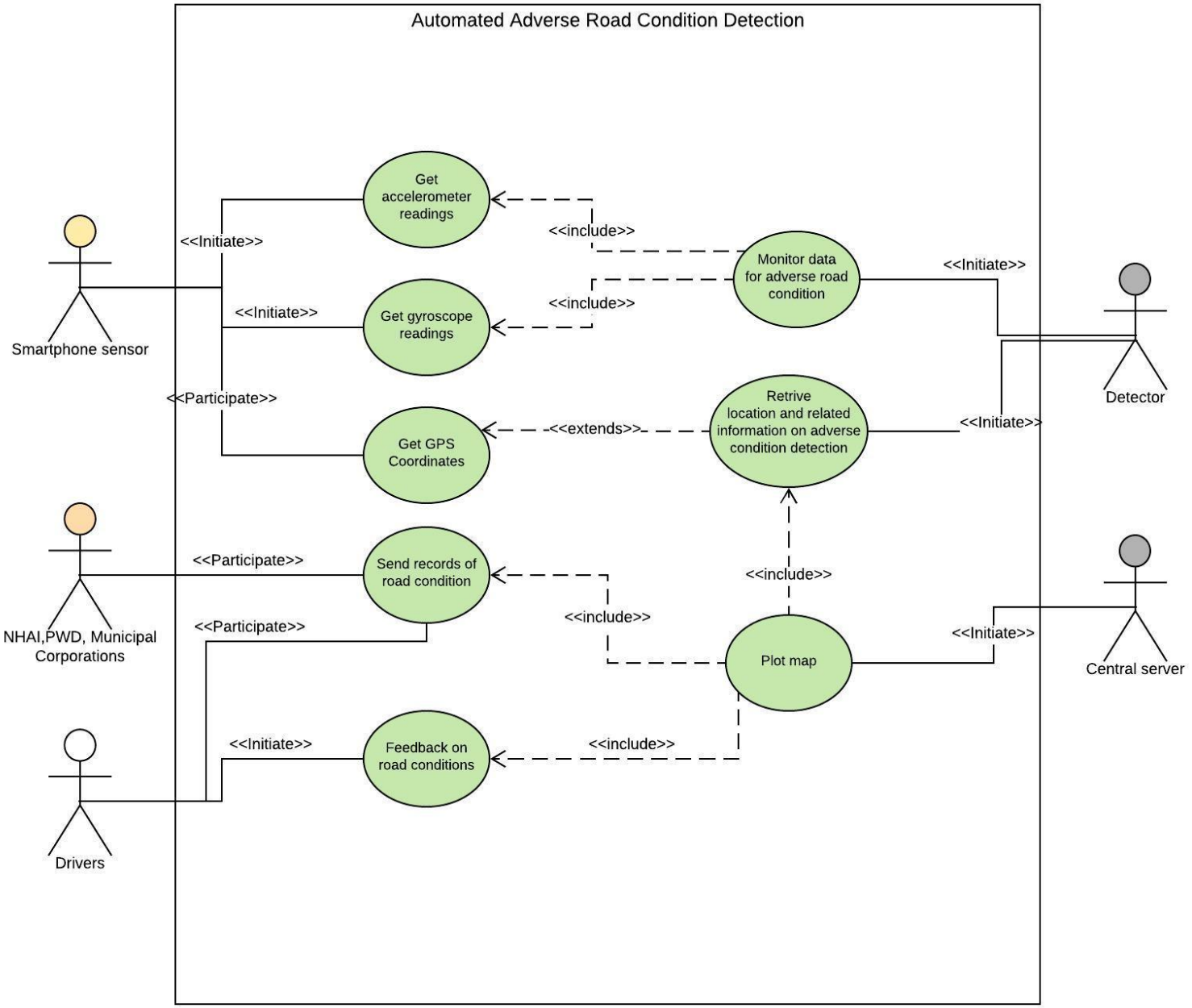
We propose the following model to detect the road conditions:

- To use data from accelerometers and gyroscopic sensors from mobile phones. Such data can be easily obtained from mobile devices used in taxi services like Ola, Uber etc.
- The above mentioned sensors obtain outputs in form of graphical variations which can be analysed using Machine Learning / AI to detect whether it is a pothole or speed breaker.
- Whenever such findings are obtained they can be marked up using GPS coordinates of mobile phones. Mapping can be even more accurate by having a threshold that after a given no. of times a pothole or speed-breaker is reported in a given location it will be mapped.
- The map so made can assist drivers to take safer routes beforehand and plan their routes accordingly thereby bringing down vehicle maintenance cost.
- Also, the details regarding road conditions will be made available to government agencies such as PWD, NHAI to carry out essential maintenance work and ensure safer roads.
- Oil spills can be detected using low cost vision based sensors by training the model.

Technology Stack

- Android Studio (for building an Android App)
- Java, XML, JavaScript
- Google Maps API
- Cloud Server
- Python and some of its libraries;
    1. Pandas.
    2. Tensorflow, OpenCV
    3. Numpy
    4. Matplotlib
    5. Scikit Learn
    6. Keras

Use Case Diagram



Dependencies / Show Stopper

- CCTV Cameras at intersections.
- Traffic Data and Vehicle information.
- Centralised Cloud-Server.
- Traffic Signals Internal connections from the centralised hub.
- Smart Phone Sensors
  - Accelerometer
  - Gyroscope Sensor