CS 653 : Mobile Computing

Project Proposal:

1. **Group ID :**

2. **Members :**
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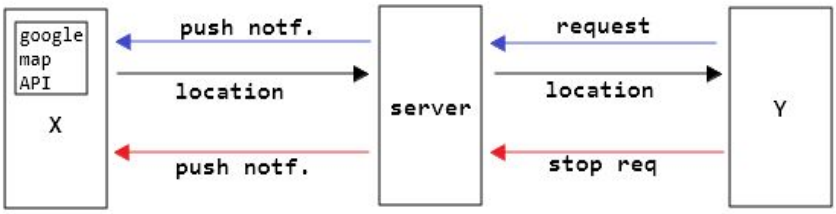
3. **Title :** Live Location Tracking and Accident Detection

4. **Motivation:**
   a. **Existing Problem**:
      i. Suppose user 'X' is out of station and user 'Y' wants to know user X's current location then user Y either has to make a phone call to user X to know his location or user X will ask user Y to send his location on WhatsApp application. But in both available solution, user Y has to respond at that particular instant but what if user Y is busy in traffic or at any place and Y is not able to respond to user X's phone calls or message, then user X can not get user Y's location. In today's world, most of the apps has location tracking facility. But to achieve this the sender has to send his/her location manually.
      ii. Also, we found out that there is scarcity of good quality accident detection app, which can detect and report any kind of accident that can happen to the user.

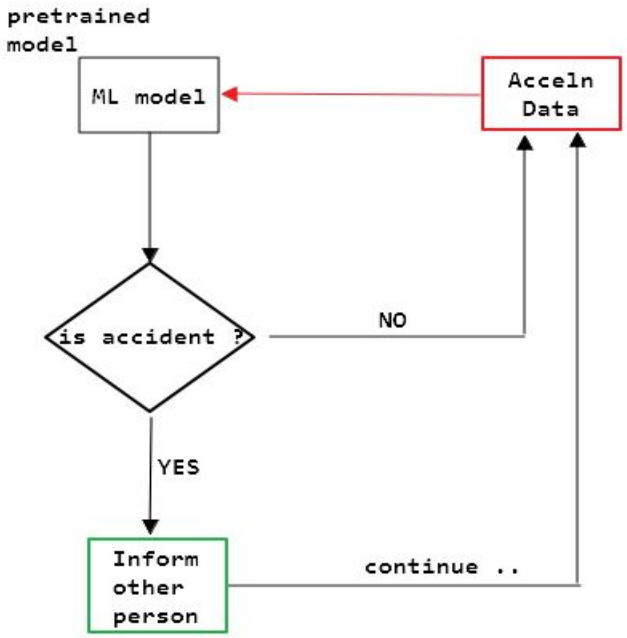
   b. **Proposed solution**:
      i. In our design an user 'X' can track real time location of user 'Y' at any time without the requirement of user 'Y's manual response. Basically, user 'Y' need not use his cell phone to grant user 'X' access his/her location at that particular time.
      ii. Although, there are many accident detection app available in the market but our app will be able to classify different types of accident detection like- car accident, collapse, etc.

5. Objective:

Live Location Tracking Module : Here Y will request for X's location and the request will go to server. Server will send push notification to X's device and after getting this push notification, X's device will start sending its location data to the server and in turn server will send that continuous stream of data to Y's device. When Y is done with location tracking then it'll send stop request to server and server will in turn send this stop request to X's device. And then X will stop sending data. The sending and receiving of push notification in X's device will happen without any intervention of X. Our app will require that much permission to do these actions in background.



Accident Detection Module : First we will collect accelerometer data while *walking*, *standing* or *sitting*. Also we'll collect data while somebody is falling on ground with mobile[obviously with precaution :)]. Then we'll implement some classification algorithm(SVM, Neural Network) and train it with our training data. Then we'll deploy our trained model in the app. The module will also have another functionality which will continuously get accelerometer data and feed that data into our pre-trained model for classification. If accident is detected then inform to ambulance service and closed ones through messaging.



6. Related Work:

Apart from our two main objective, our app would also come handy in tracking mobile phone if one loses his/her mobile phone.

7. Additional Platforms:

Android Studio, Google Firebase, Google Cloud ML, Some third party server(Google).

8. Additional Libraries:

Google Map API, GPS, Accelerometer, Push Notification, Google RPC(maybe).

9. Milestones: (tentative schedule):

- **Week 1(7.2.18 - 14.2.18):**
  - Basic GUI creation with designing the wireframe.
  - App flow model.
- **Week 2(15.2.18 - 22.2.18):**
  - Establishing connection to cloud server and save state in the server.
- **Week 3(23.2.18 - 2.3.18):**
  - MID SEM.
- **Week 4(3.3.18 - 10.3.18):**
  - GPS data collection and storing in the server.
  - Working with push notification.
  - Sending GPS data to the devices and display using google map api.
- **Week 5(11.3.18 - 18.3.18):**
  - Optimization of location tracking.
  - Start collecting accelerometer reading for different cases.
  - Testing with ML and rule based model for accident detection..
- **Week 6(19.3.18 - *26.3.18(deadline)*)**
  - Wrapping up the whole app and fine tuning every parameter with finishing touch in the GUI.
  - Publishing the app in **Google Play Store**.
- **Week 7(27.3.18 - 3.4.18)**
  - Reserved For Unexpected Delays.
- **Week 8(4..4.18 - 11.4.18)**
  - Reserved For Unexpected Delays.

10. Challenges:

- We don't have enough knowledge in Google firebase, Google cloud ML.
- Getting accelerometer and GPS data from mobile is unknown to us.
- For establishing the connection between peer to cloud server connection we need to know about push notification (firebase or GCM) and Google RPC.
- Continuous use of network and GPS will lead to battery issues for the mobile.
- During unavailability of network it'll be difficult to get the user's location.