ECE 573 Project
Project Requirements

Team CATV

Last Updated: 4th February 2016

1 System Requirements

1.1 Overview

This section explains the environment settings and hardware/software requirement for the project.

1.2 Software and Hardware Requirements

- An android OS equipped smartphone with internet connectivity either in the form of cellular data or wifi.
- An Autonomous vehicle capable for acting as a ROS Publisher to publish messages such as headway, headway angle, positions, velocity, acceleration, heading, array of distance measurements, gas/fuel availability from actuators/sensors present in the autonomous vehicle.

2 Application/Functional Requirements

2.1 Overview

The Application will act as an interface to display the crucial information of the autonomous vehicle CATVehicle regarding its current state and other variables present governing the state of the vehicle.

2.2 'B' requirements

1. The Application should be able to establish a connection to to the ROS publisher of the CATVehicle. Difficulty level: 1.
2. The Application should be able to receive the ROS message being published by the CATVehicle's ROS publisher. Difficulty level: 2. Dependency: B1.

3. The Application should be able to display a graphical representation of the timeseries messages being received. Difficulty level: 3. Dependency: B2.

4. The Application should be able to perform error analysis of the messages for system consistency. Difficulty level: 3. Dependency: B3.

5. The Application should be able to save the message in specified format and should be able to email via favorite email client when prompted. Difficulty level: 1. Dependency: B4.

2.3 'A' requirements

1. The Application should be able to trigger a warning notification when it detects that the vehicle is exceeding the speed limit. Difficulty level: 3. Dependency: B requirements.

2. The Application should send a decelerate command to the car if above situation occurs. Difficulty level: 3. Dependency: A1.

3. The Application should be able to notify user if the LIDAR detects obstruction in front of the car. Difficulty level: 4. Dependency: B requirements.

4. The Application should be able to send control commands to the vehicle. Difficulty level: 3. Dependency: B1-B3.

5. The Application will compare GPS output of the car with phone GPS readings and be able to alert the user of discrepancies. Difficulty level: 5. Dependency: B requirements.

6. The Application will allow the User to enter an expected update frequency from the vehicle and if this frequency is not met the User will be alerted. Difficulty level: 5. Dependency: B requirements.

3 Release Plan

The requirements are divided into two categories: 'B' and 'A'. 'B' requirements will be fulfilled in the alpha release. 'A' requirements can be fulfilled in the beta release. By the beta release, the application will have all the vital functionality and final release will be done after extensive testing and bug fixing, if any.