FAMU-FSU College of Engineering

Department of Electrical & Computer Engineering

Needs Analysis Report

Team 2 - Vehicle-to-Vehicle Communication Project

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Overview

The purpose of this project is design an efficient system to alert motorists of possible collision situations. A module will be developed that can be installed in a vehicle where it will be used to collect position and velocity data. The module will share this information with other nearby vehicles and a series of alerts will be generated that will warn the driver of any potential collisions. This project is partnered with the School of Business and Industry at Florida A&M University who has a team working parallel with the engineering team. Currently, the business team is gathering information to develop customer use cases. This information will be utilized to define technical requirements and specifications for which the engineering team will need to satisfy.

Statement of the Problem

Vehicle collisions are of main concern to the global society. Approximately 1.3 million people die due to road crashes [ASIRT] with an average of 3,287 deaths each day. It is predicted that by 2030 that road traffic crashes will be the fifth leading cause of death. Protecting the livelihood of the individuals in a vehicle has become of high importance to many automotive companies leading to the development of vehicle-to-vehicle communication.

Operational Description

Utilizing SAE connected vehicle standards and vehicle safety communications, a device will be developed to gather, interpret and transmit data between vehicles and provide a real-time warning system for motorists. The device will help minimize automotive accidents by giving motorists the opportunity to stop or slow down the vehicle to avoid colliding with another vehicle or to alert the direction of the vehicle if intended path will possibly lead to a collision.

Needs & Wants

- Collision-early warning system
- Based on speed, determine imminent collision with nearby vehicles
- Collision prediction based on vehicle's speed and direction/position
- Ability to measure where vehicle is and where it is headed
- Hazard warning
- Traffic modeling
- Automated parking/traffic merging