Cooperative Adaptive Cruise Control

Software Engineering CSE435
Michigan State University
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Team members:

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Project Overview

- Motivation: safe and efficient travel
- Maintain constant forward vehicle speed
- Detect and maintain safe distance from target vehicle
- Function in a platoon
- Software-based electronic control system
Overview of Features

● Radio communication, GPS, radar, camera
● Interactive user interface
● Maintain speed and safe distance
● Lane keeping, curve speed assist, hill management
Domain Research

- Investigated sensors in adaptive cruise control systems
- Investigated platoon functionality
- Applied this research to our CACC requirements
- Project Constraints
  - Large amount of memory required
  - Delay in communication can cause lack of information
  - Weather and road conditions
Prototype

http://cse.msu.edu/~rajend16/
Vehicle Enters Platoon

1: buttonPress()

[if inPlatoon == false]
2: addVehicle(vehicle)

2.1:

http://cse.msu.edu/~rajend16/prototypes/prototype1.html
Vehicle Leaves Platoon

1: buttonPress()

[if inPlatoon == true]
2: removeVehicle(vehicle)

http://cse.msu.edu/~rajend16/prototypes/prototype2.html
Solo Driver/ Lead Vehicle

http://cse.msu.edu/~rajend16/prototypes/prototype3.html
Obstacle in Path

http://cse.msu.edu/~rajend16/prototypes/prototype5.html
Lead Vehicle Avoids Obstacle

http://cse.msu.edu/~rajend16/prototypes/prototype6.html
We gratefully acknowledge and appreciate the participation of our customer, Mr. William Milam, from Ford Motor Company
Questions?