Team members:

Project Manager: Justin Rush
Facilitator: Mariah Gilman
Customer Liaison: Vincent Sabatini
Configuration Manager: Jordyn Castor
Safety Engineer: Ryan Switzer

Customer: Dr. Rami Debouk
Instructor: Dr. Betty H.C. Cheng*

*Please direct all inquiries to the instructor.
Project Overview

- FSRACC is an embedded system that adjusts the speed of the subject vehicle based on the speed of forward vehicles
- FSRACC is a convenience feature for the driver
  - Provides more functionality than a basic cruise control system
  - Not intended as a safety feature
Overview of Features

• The system uses radar to detect vehicles in front of the subject vehicle
• The Path Prediction feature uses sensors to determine the path of the subject vehicle and identify possible threats
• The driver can take control by pressing the brakes or accelerator at any time
• Lights/Indicators on the dashboard show the status of the FSRACC system
Overview of Features

• The driver can set a speed that the vehicle will maintain (assuming no forward vehicle is detected)
• The driver can also set a distance that the subject vehicle will follow behind other vehicles
• The system will work from 0 to 85 miles per hour
  – Including stop and go traffic
Domain Research

• Analyzed existing adaptive cruise control systems
  – Nissan Intelligent Cruise Control
  – Ford Adaptive Cruise Control
  – Delphi Adaptive Cruise Control

• Applied domain knowledge to specify the units used for following distance
  – Car lengths
  – Distance
  – Seconds
Constraints

- The FSRACC system needs full access to the accelerator and the brakes of the car to control the speed.
- The system performs checks on all sensors before activating.
- If the radar is blocked, or any other internal errors occur, the driver will be notified and the system will turn off.
- The FSRACC system is not expected to be able to stop for stationary objects in front of the vehicle, the driver must be aware at all times.
State Diagram
Demonstration

Interactive prototype allows the user to adjust subject and forward vehicle settings to create unique scenarios.

http://www.cse.msu.edu/~cse435/Projects/F2014/Groups/FSRACC2/Prototype/prototype.html
Acknowledgements

• We gratefully acknowledge and appreciate the participation of our customer, Dr. Rami Debouk from General Motors
Questions?