Overview of Project SCC-1
Software Engineering CSE435
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*Please direct all inquiries to the instructor.*
Project SCC-1 Overview

• System provides functionality of accident prevention through a cruise control that scales with the speed and distance of a leading vehicle.

• Motivation for project
  – Safer cruise control system, preventing crashes.
  – User following dist and speed control, activating emergency stop.
Technical Definitions

- SCC - Scalable Cruise Control
- FDM - Following Distance Management
- AEB - Automatic Emergency Brakes
- SC - Simple Cruise
Overview of Features I

• Simple Cruise
  – Sets a speed to be maintained greater than 25 mph.
  – Driver may exceed the set speed through direct throttle inputs.
  – Driver may suspend the feature through a button press or by depressing the brake pedal.
  – Driver may increase/ decrease the set speed with button presses.
Overview of Features II

- Following Distance Management (FDM)
  - Set a following distance from a leading vehicle.
  - Vehicle maintains maximum possible safe speed through throttle and brake control and tracking lead vehicle speed and distance.
  - Alerts the driver in case of emergency.
Overview of Features III

- **Automatic Emergency Brake (AEB)**
  - Inputs come from vehicle speed, and camera /radar object tracking.
  - Applies maximum braking pressure to minimize stopping distance.
  - Functions regardless if SC is enabled.
Domain Research

• Investigated vehicle braking and acceleration
• Needed to apply domain knowledge on intercept distance.
• Project Constraints
  – AEB braking distance
  – FDM time to intercept
  – Prototype model behavior
Figure 1: Case Diagram
Scenario 1: Setting Speed

• User sets vehicle’s cruise control speed to 26 mph.
• User attempts to decrease cruise control speed through button press.
• Cruise control remains at a set speed of 26 mph.
Scenario 2: AEB Engaged

- Using SCC a vehicle’s cruise speed is set to 40mph
- The vehicle suddenly encounters a stopped vehicle in the same lane
- The driver doesn’t have time to react
- The system engages AEB to stop the car
Scenario 3: FDM Activated

- Using SCC a vehicle’s cruise speed is set to 30mph
- Using FDM a following distance of increment 2 is set
- The vehicle encounter another one in the same lane which is moving 25mph
- FDM slows down the original vehicle to maintain the following distance
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