Team members:

- Project Manager: Tyler Olsen
- Facilitator: Jacob Ray
- Safety Engineer: Richard Brush
- Customer Liaison: Jourdan West
- Artifacts Manager: Maxime Goovaerts

Customer: Tony Torre (Chrysler)
Instructor: Dr. Betty H.C. Cheng*

*Please direct all inquiries to the instructor.

**Project Overview**

**Functionality**
- Our product is intended to aid the driver in the steering of a vehicle.
- The system automates certain routines such as parking and lane adjustment
- Handles input from a vehicle’s ADAS modules
Motivation
● This system attempts to address some of the inconsistent actions humans make while driving
● By automating routine vehicle actions, consistency is introduced into a volatile environment

Facilitations
● Park assist removes the need for the user to maneuver into a potentially difficult parking spot
● Automatic lane keeping helps keep the driver on the road and avoid collisions

Overview of Features
● Multiple input sources
● Torque-based steering assistance
● Safety is paramount
Domain Research

• Investigated power steering systems
• Applied software engineering principles to designing EPAS control software
• Project Constraints
  • Driver must be able to override system at all times
  • Must function in real time
  • Limited CAN bandwidth will limit the number of ADAS inputs

Part II: Model-based View of System

• Use Case Diagram
• Sequence Diagram
**Our Prototype**

**Prototype**

**Driver Controls:**
- Steering Angle: 0°
- Steering Torque: 0
- Speed: 0 mph

**ADAS Controls:**
- Lane Position Correction
- Start/Stop
- Autonomous Parking

**Output:**
- Angle Out: 0°
- Torque Out: 0

**ADAS Visualization:**

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**Scenario 1: Driver Control**

**Driver Controls:**
- Steering Angle: 75°
- Steering Torque: 3
- Speed: 15 mph

**ADAS Controls:**
- Lane Position Correction
- Start/Stop
- Autonomous Parking

**Output:**
- Angle Out: 10°
- Torque Out: 0

**ADAS Visualization:**
Scenario 2: **LPC Off**

**Driver Controls:**
- Steering Angle: 360°
- Steering Torque: 33
- Speed: 25 mph

**ADAS Controls:**
- Lane Position Correction
- Start/Stop
- Autonomous Parking

**Output:**
- Angle Out: 50°
- Torque Out: 0

**ADAS Visualization:**

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Scenario 3: **LPC On**

**Driver Controls:**
- Steering Angle: 360°
- Steering Torque: 20
- Speed: 25 mph

**ADAS Controls:**
- Lane Position Correction
- Start/Stop
- Autonomous Parking

**Output:**
- Angle Out: 10°
- Torque Out: 0

**ADAS Visualization:**
Scenario 4: **LPC Driver Override**

**Driver Controls:**
- Steering Angle: 30°
- Steering Torque: 5
- Speed: 2 mph

**ADAS Controls:**
- Lane Position Correction
- Start/Stop
- Autonomous Parking

**Output:**
- Angle Out: 42°
- Torque Out: 0

**ADAS Visualization:**

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Scenario 4: **AP On**

**Driver Controls:**
- Steering Angle: 30°
- Steering Torque: 2
- Speed: 2 mph

**ADAS Controls:**
- Lane Position Correction
- Start/Stop
- Autonomous Parking

**Output:**
- Angle Out: 41°
- Torque Out: 0

**ADAS Visualization:**
**Scenario 5: AP Override**

**Driver Controls:**
- Steering Angle: 200°
- Steering Torque: 11
- Speed: 20 mph

**Output:**
- Angle: 95°
- Torque: 2

**ADAS Visualization:**
- Driver Override

**Acknowledgements**

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Questions?