Beta Presentation
Hardware in the Loop (HIL) Vehicle Simulator

The Capstone Experience

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Project Overview

• Windows 10 application that will simulate a vehicle’s CAN Bus by using a HIL system.
• Current hardware is too expensive and not available to all of Bosch’s engineers at once.
• Simulates vehicle functions such as acceleration, steering, braking, gear changing, cruise control, and more.
• Ability to simulate different variations of vehicles that is configurable by the user.
System Architecture

Windows 10

PCAN Basic API

Python

wxPython

DBC Files

PEAK Driver

PCAN-USB Pro FD

Bosch Radar

BOSCH
Hardware in the Loop Diagram
The Main Frame

30.0 Kph 18.6 Mph 1500 Rpm
Cruise Control State: 2 ACC Engaged
Cruise Control Set Speed: 40 Kph, 25 Mph
HMI Cruise: 36 ACC Proximity Warning
HMI Brake: 0 No Code
HMI Lane: 0 No Code
Wheel Positions: RHR RHF LHR LHF
Wheel Speeds: 30.0 30.0 30.0 30.0
Wheel Pulse Counters: 40 40 40 40
The Main Frame/Search Frame
The Project Configuration Frame
The Graph Frame

![Signal Trace Graph]

- ENGINE1.EngineSpeed
- 1_DASM_DIAG_REQ.PUDN
- 1.CTRL_CRUISE.ACC_On
- 1.STATUS_C_DASM.CurrentFailSts_DASM
- 1.STATUS_C_DASM.GenericFailSts_DASM
- 1.STATUS_DASM.ACCSystemSts
- 1.STATUS_DASM.DISPLAY.DisplaySts_ACC
- 1.STATUS_DASM.DISPLAY.DisplaySts_OFF
- 1.STATUS_DASM.DISPLAY.DisplaySts.Veh
- 1.STATUS_DASM.DISPLAY.Set.Speed.MPH
- 1.STATUS_DASM_INDICATION.ACC_DisPcpnu
- 1.STATUS_DASM_INDICATION.ACC_FailSts
- 1.STATUS_DASM_INDICATION.NCC_FailSts
What’s left to do?

• Stretch Goals
  ▪ The ability to log tests and load logs.
  ▪ Add tips and pop-ups to the GUI for helpful hints.

• Other Tasks
  ▪ Create a way to turn our project into an executable.
  ▪ Review our code in accordance with PEP8.
  ▪ Continue optimizing and refactoring our code.
  ▪ Continue testing our application.
Questions?