

Task-based learning

VEHICLE CONTROL SYSTEMS FOR EVERYBODY (VCSE)

Learn by doing...

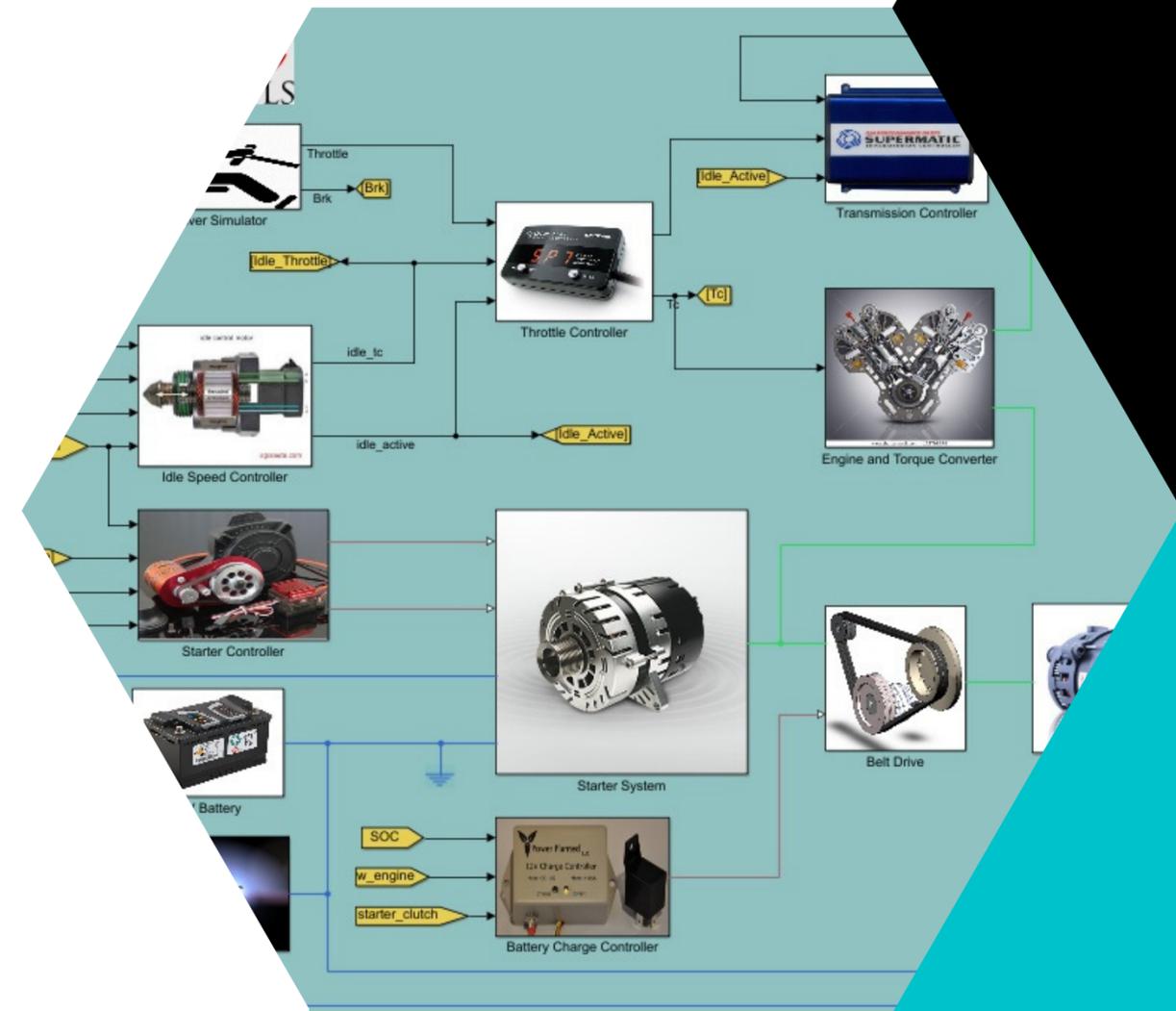


eMOBILITY - PROJECT #1

Overview:

Model and Control Bosch Electronic Throttle by Wire System

1. Understanding the requirements and architecture of the Bosch TBW system.
2. Developing a plant model of the Bosch Electronic throttle using components from Simscape and understanding the physical equations.
3. Creating the controller which can take inputs from two sensors: accelerator pedal and brake pedal, and drive the throttle butterfly valve actuator.
4. Comparing the performance of a feedforward and feedback controller.
5. Testing of the controller and plant model and analyzing the results.

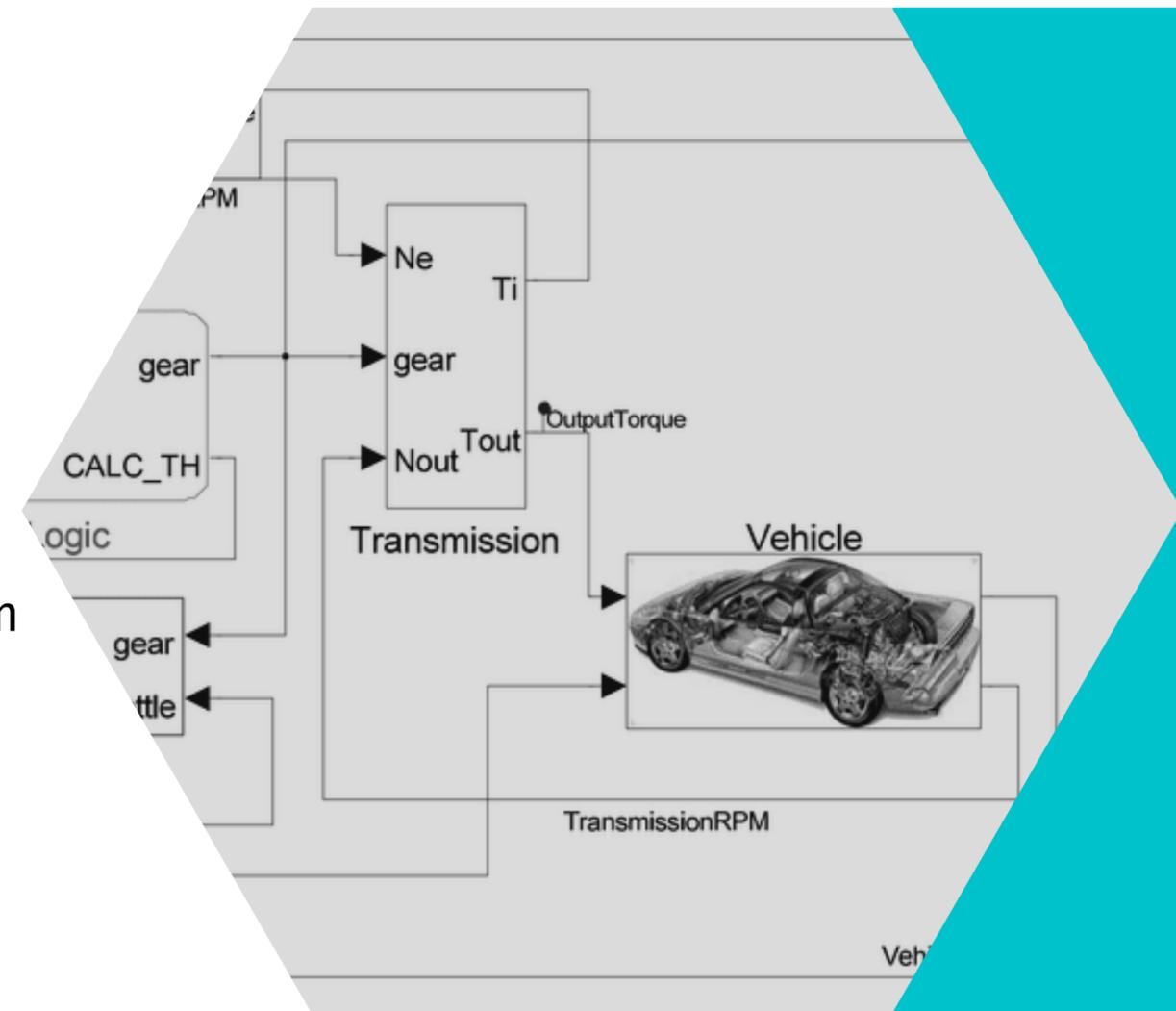


eMOBILITY - PROJECT #2

Overview:

Control and modelling of gear shift mechanism for an automated manual transmission

1. Understanding the requirements of the system.
2. Calculating the step rate, required angle rotation and minimum torque requirements at stepper motor used for automating shift.
3. Creating a model of the shift mechanism using components from Simscape and Simpowersystems library.
4. Creating the shift schedule, strategy & shift map controller with an error resolution loop using Stateflow.
5. Testing of the controller and plant model.
6. Data analysis of the shift dynamics and controller rectification/recalibration.

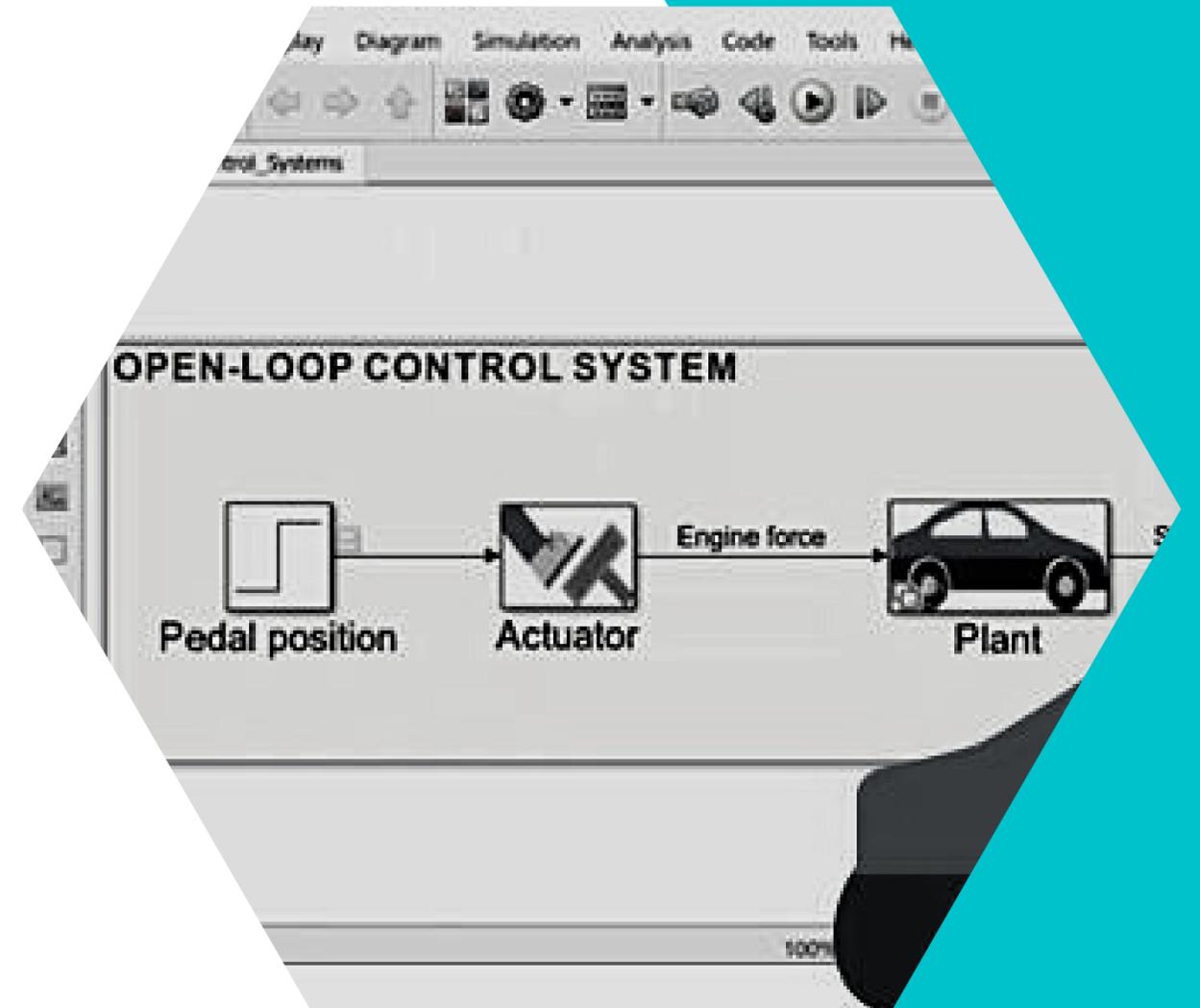


ADAS PROJECT

Overview:

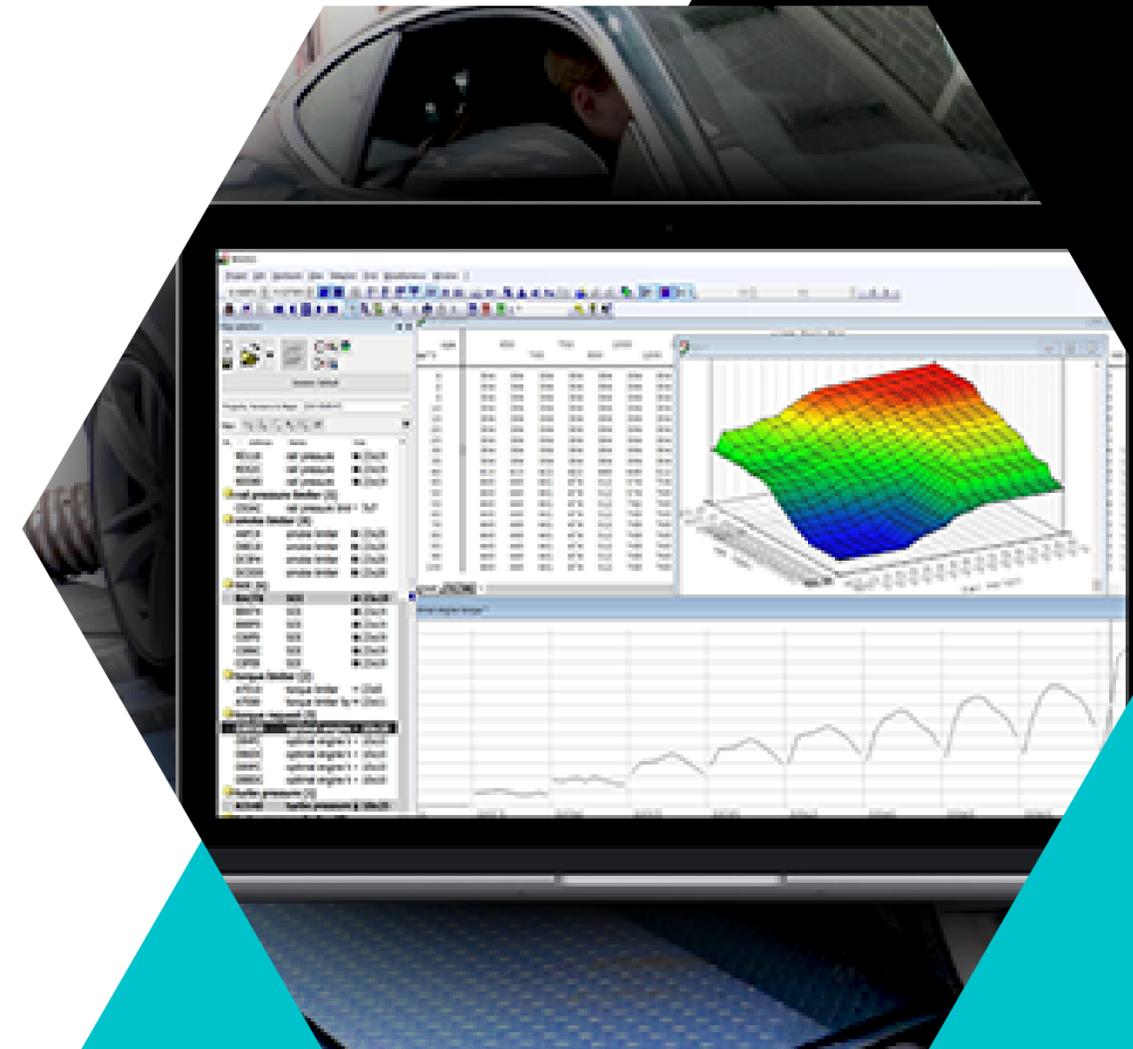
Design and development of the forward collision warning and automated emergency braking system using MBD approach

1. Understand the stakeholders' concerns and write down the requirement.
2. Develop a high-level architecture for this feature.
3. Develop a low level architecture for each subsystem [Synthetic sensors, Perception, Prediction, Controller, Vehicle dynamics].
4. Perform a MIL and SIL testing.
5. Develop a code for the controller.



KEY TAKEAWAYS FROM VCSE PROGRAM

1. Learn to
 - Apply control algorithms
 - Create real-time simulation models in Matlab/Simulink/Stateflow
 - Generate Autocode using Simulink coder
 - Test case generation to verify and validate your system model
 - Analyze the test data and perform root cause analysis
 - Perform FMEA on open issues
2. Create your own simulation model & control algorithm from scratch



ENROLLMENT DETAILS



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