SIL/HIL Techniques for Automotive Control Development

This 8-hour self-paced seminar on DVD is a component of the Advanced Propulsion and Powertrain certificates. Software-in-the-Loop and Hardware-in-the-Loop is used to improve the vehicle and powertrain development process. These techniques have been adopted in many industries, including automotive, in order to improve various aspects of software development.

The seminar introduces SIL/HIL concepts along with designing plant/control models; methods to determine required model/control fidelity; ways of tying DFMEA/FTA results to develop test plans; and analysis of model coverage for fault analysis. Although this seminar focuses on the use of Matlab-Simulink and dSPACE tools, the approach will be generic enough for application to other platforms. The end result is a structured perspective on how SIL/HIL tools can be used to improve the quality of automotive controls.

Lectures feature the following topics:

- SIL/HIL design requirements
- SIL/HIL model architecture
- Plant model design
- Control model design
- Test plan development

Prerequisite: Basic knowledge of Matlab, specifically developing dynamic models and control algorithms in Simulink.

OSU’s automotive engineering certificates include collaboration with Swiss Federal Institute, University of Stuttgart, and Korean Advanced Institute of Science and Technology.