Control System Design with Simulink

OEM: MathWorks • Duration: 2 Days (16 hrs) • Code: MW-CONTROL-SYSTEM-DESIGN-WITH-SIMULINK

COURSE MODULES & TOPICS

Day 1 of 2

White-box Modeling

- Model representations overview
- Simulink block diagrams
- Modeling with Transfer Functions
- Physical Modeling with Simscape

Parameter Estimation

- Parameter estimation overview
- Model preparation
- Estimation process
- Parameter estimation tips

Introduction to PID Control

- Open loop control
- Closed loop control
- PID Controller workflow
- Integral control

Response Optimization

- Optimizing model response
- Performing sensitivity analysis
- Optimizing with parameter uncertainty
- Validating design robustness using sensitivity analysis

Model Linearization and Analysis

- Linearization workflow
- Operating points
- Frequency domain and Bode plot
- Comparing linearized to nonlinear models

Day 2 of 2

Classical Control Design

- Control System Designer
- Frequency domain tuning
- Graphical tuning
- Testing the controller

Gain Scheduling in Simulink

- Gain scheduling overview
- Gain Scheduled PID Autotuner workflow
- Storing scheduled gains
- Implementing a gain scheduled PID Controller

System Identification

- System identification overview
- Data importing and preprocessing
- Model estimation
- Model validation

Controller Implementation

- Identifying physical and practical limitations of controllers
- Discretizing a controller
- Preparing a controller for code generation