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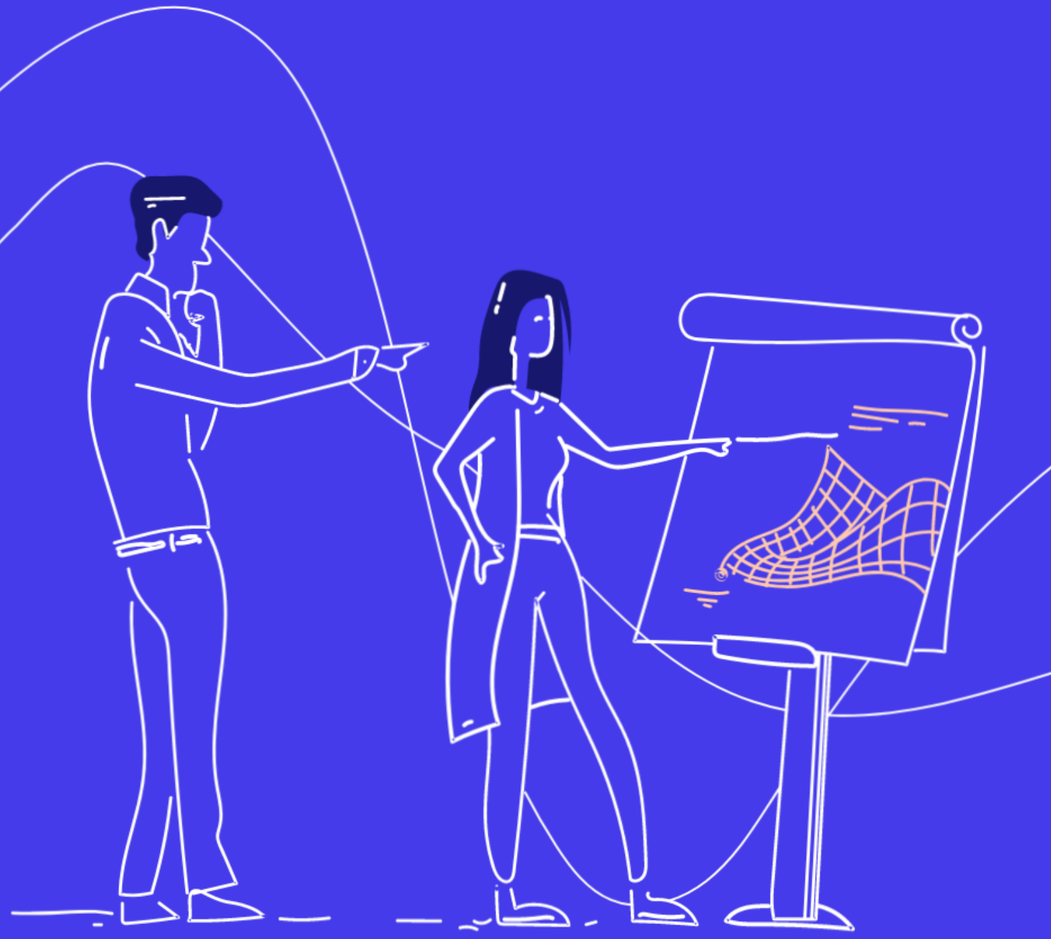
Power Electronics Control Design with Simulink and Simscape



SciEngineer's training courses are designed to help organizations and individuals close skills gaps, keep up-to-date with the industry-accepted best practices and achieve the greatest value from MathWorks® and COMSOL® Products.

Power Electronics Control Design with Simulink and Simscape

This one-day course focuses on modeling and controlling power electronic systems in the Simulink environment using Simscape Electrical. Themes of DC power electronic systems, converter model fidelity, linearization and control, three-phase power electronic systems, and motor control are explored throughout the course.

Prerequisites

MATLAB Fundamentals, Simulink for System and Algorithm Modeling, and Modeling Physical Systems with Simscape

TOPICS

Day 1

- Introduction to Power Electronics
- Converter Model Fidelity
- Linearization and Control
- Modeling Three-Phase Power Electronic Systems
- Motor Control

Introduction to Power Electronics

OBJECTIVE: Learn to model and analyze DC power electronic systems.

- Modeling a boost converter
- Measuring physical quantities
- Visualizing results
- Selecting a solver

Converter Model Fidelity

OBJECTIVE: Learn to build power electronic models using the most appropriate level of fidelity.

- Selecting appropriate converter model fidelity
- Using prebuilt components
- Logging and comparing signals
- Measuring efficiency and losses

Linearization and Control

OBJECTIVE: Learn to linearize power electronic switching models and tune closed-loop control systems.

- Implementing closed-loop voltage control
- Linearizing power electronic converters
- Tuning the controller

Modeling Three-Phase Power Electronic Systems

OBJECTIVE: Learn to model and analyze three-phase AC power electronic systems.

- Modeling a three-phase inverter
- Measuring three-phase physical quantities
- Characterizing harmonics and distortion

Motor Control

OBJECTIVE: Learn to model and control electric motors using power electronics.

- Modeling a PMSM motor
- Implementing motor control
- Verifying the motor design
- Integrating into a system-level model

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Expand your knowledge