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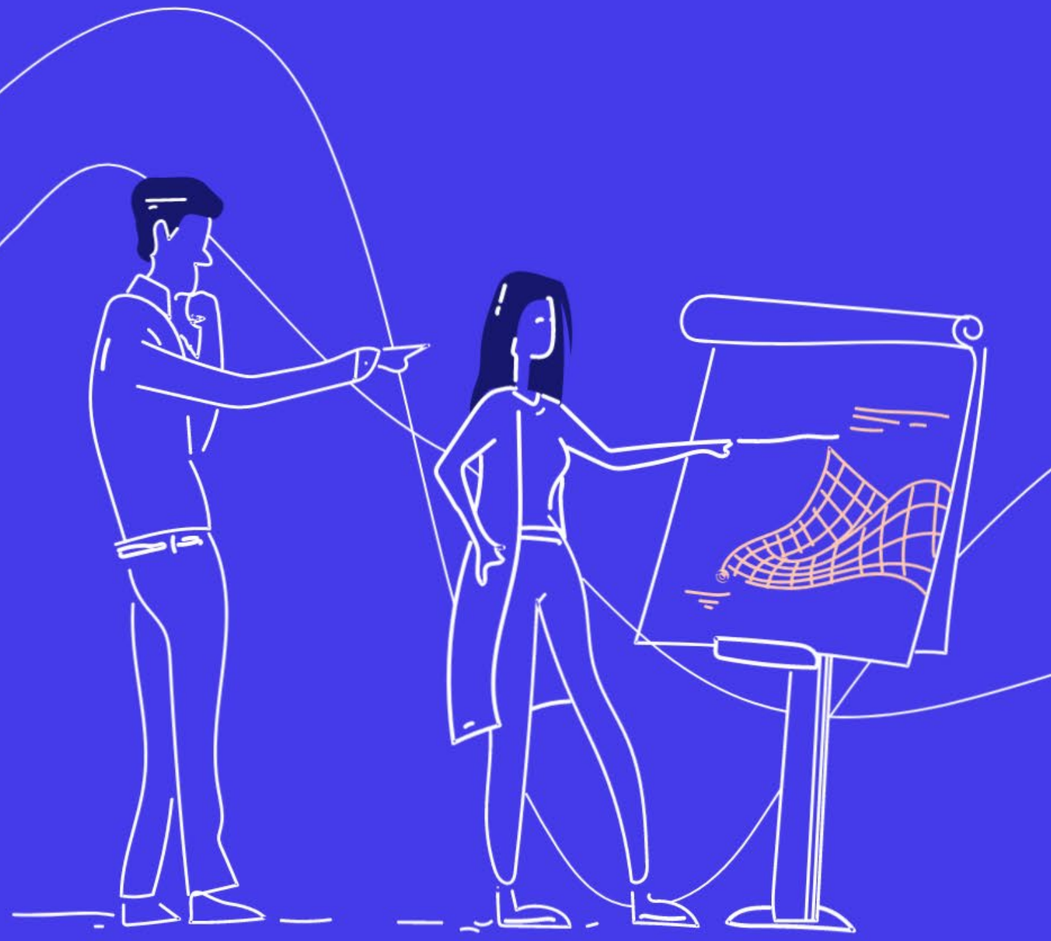
Stateflow for Automotive Applications



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.

Stateflow for Automotive Applications

This two-day course shows how to model and simulate decision logic using Stateflow. The course focuses on how to employ flow charts, state machines, truth tables, state transition tables and component-based modeling in Simulink designs. The course offers hands-on automotive examples and exercises that apply basic techniques to realistic problems in the automotive industry.

Prerequisites

MATLAB Fundamentals for Automotive Applications and Simulink Fundamentals for Automotive Applications.

TOPICS

Day 1

- Modeling Flow Charts
- Modeling State Machines
- Hierarchical State Diagrams
- Parallel State Diagrams

Day 2

- Using Events in State Diagrams
- Calling Functions from Stateflow
- Truth Tables and State Transition Tables
- Component-Based Modeling in Stateflow

Modeling Flow Charts

OBJECTIVE: Implement decision flows with flow charts.

- Junctions and transitions
- Flow chart behavior
- Stateflow interface
- Conditions and condition actions
- Chart data
- Common patterns

Modeling State Machines

OBJECTIVE: Implement state machines with state transition diagrams.

- State machine behavior
- State and transition actions
- Chart initialization
- Action execution order
- Flow charts within states
- Mealy and Moore charts

Hierarchical State Diagrams

OBJECTIVE: Implement hierarchical diagrams to improve the clarity of state machine designs.

- Superstates and substates
- State data
- History junction
- Transition priority
- Action execution order

Parallel State Diagrams

OBJECTIVE: Implement parallel states to model multiprocessing designs.

- Benefits of parallel states
- Chart/state decomposition
- Parallel state behavior

Using Events in State Diagrams

OBJECTIVE: Use events within a Stateflow diagram to affect chart execution.

- Using events in state diagrams
- Broadcasting events
- Behavior of state diagrams that contain events
- Implicit events
- Temporal logic operators

Calling Functions from Stateflow

OBJECTIVE: Create functions in a Stateflow chart out of Simulink blocks, MATLAB code, and flow charts.

- Types of functions
- Simulink functions
- MATLAB functions
- Graphical functions

Truth Tables and State Transition Tables

OBJECTIVE: Create flow charts and state transition diagrams in tabular form.

- Truth tables
- Conditions, decisions, and actions
- State transition tables
- States, transitions, and actions

Component-Based Modeling in Stateflow

OBJECTIVE: Reuse Stateflow designs, constrain chart semantics, and interact with structured Simulink data.

- Bus signals
- Data types
- Atomic subcharts
- Data mapping
- Chart reuse

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Expand your knowledge