

Modelado de Sistemas y Algoritmos con Simulink[®].

Curso presencial

Objetivo del curso:

Creating and modifying Simulink models and simulating system dynamics, modeling continuous-time, discrete-time, and hybrid systems, modifying solver settings for simulation accuracy and speed, building hierarchy into a Simulink[®] model, creating reusable model components using subsystems, libraries, and model references.

Requisito(s):

MATLAB[®] fundamentals.

Descripción del curso:

Demonstrate how to apply basic modeling techniques and tools to develop Simulink[®] block diagrams.

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Emmanuel Olivar Domínguez, egresado de la Universidad Autónoma de la Ciudad de México (UACM), cuenta con amplia experiencia en el mantenimiento preventivo y correctivo de equipo electrónico industrial y comercial, además de utilizar tecnología Mathworks (MATLAB y Simulink) por más de cinco años. Se especializa en las áreas de control e instrumentación con la finalidad de apoyar en la solución de las problemáticas que se puedan presentar en éstas, además de utilizar diversas herramientas con el fin de desarrollar controladores aplicados a la industria.

Actualmente ocupa el cargo de Ingeniero de Aplicación MATLAB en MultiON Consulting S.A. de C.V. en donde se dedica a la resolución de problemas de índole computacional que enfrentan organizaciones tanto públicas como privadas.

Temario

**El manual del curso se encuentra en inglés.*

1. Introduction.
 - 1.1 MathWorks® at a Glance.
 - 1.2 MathWorks® Product Overview.
 - 1.3 Diverse Users.
 - 1.4 Computer Setup.
 - 1.5 What Can You Do with Simulink®?
 - 1.6 System Design Process.
 - 1.7 Model-Based Design with Simulink®
 - 1.8 Overview of Dynamic Systems.
 - 1.9 Course Example.

2. Creating and Simulating a Model.
 - 2.1 Modeling the System with Equations.
 - 2.2 Creating a New Simulink® Model.
 - 2.3 Using the Simulink® Library Browser.
 - 2.4 Adding and Connecting Blocks.
 - 2.5 Labeling Blocks and Signals.
 - 2.6 Defining Block Parameters.
 - 2.7 Defining Lookup Table Parameters.
 - 2.8 Defining System Inputs.
 - 2.9 Defining System Outputs.
 - 2.10 Simulating the Model.
 - 2.11 Overview of Simulink® Solver.
 - 2.12 Simple Models – Default Step Size.
 - 2.13 Adding Signal Viewers.
 - 2.14 Overview of Signal Viewers.
 - 2.15 Customizing Signal Viewers.
 - 2.16 Additional I/O Blocks.
 - 2.17 Managing Model Parameters.

3. Modeling Programming Constructs.
 - 3.1 Approaches to Modeling Programming Constructs.
 - 3.2 Modeling Comparisons.
 - 3.3 Modeling Decision Statements.
 - 3.4 Extracting and Combining Data Using Vectors.
 - 3.5 Modeling the System with Equations.
 - 3.6 Building a Block Diagram.
 - 3.7 Zero-Crossing Detection.

- 3.8 Zero-Crossing Solver Support.
- 3.9 Modeling with MATLAB® Function Blocks.
- 3.10 Understanding the MATLAB® Function Block.

- 4. **Modeling Discrete Systems.**
 - 4.1 Sample Times.
 - 4.2 Defining Discrete-State Systems.
 - 4.3 Modeling Difference Equations.
 - 4.4 Modeling the System with Equations.
 - 4.5 Building a Block Diagram.
 - 4.6 Simulating a Model That Contains Discrete Signals.
 - 4.7 Creating Discrete State-Space and Transfer Function Models.
 - 4.8 Modeling Multirate Systems.
 - 4.9 Simulating a Model That Contains Multirate Discrete Signals.

- 5. **Modeling Continuous Systems.**
 - 5.1 Defining Continuous-State Systems.
 - 5.2 Modeling Continuous-State Systems with Simulink®.
 - 5.3 Modeling Differential Equations.
 - 5.4 Modeling the System with Equations.
 - 5.5 Building a Block Diagram.
 - 5.6 Defining Block Parameters.
 - 5.7 Simulating a Model That Contains Continuous States.
 - 5.8 Creating Continuous State-Space and Transfer Function Models.
 - 5.9 Modeling Physical Boundaries.

- 6. **Solver Selection.**
 - 6.1 Accuracy and Speed.
 - 6.2 Understanding the Simulink® Solver.
 - 6.3 Solving Simple Models.
 - 6.4 Solving Models with Discrete States.
 - 6.5 Solving Multirate Models.
 - 6.6 Solving Models with Continuous States.
 - 6.7 Common Performance Concerns.
 - 6.8 Default Solvers.
 - 6.9 Continuous-State Dynamics – Solver Type.
 - 6.10 Continuous-State Dynamics – Solver Selection.
 - 6.11 Continuous-State Dynamics – Tolerances.
 - 6.12 Zero Crossings.
 - 6.13 Handling Consecutive Zero Crossings.
 - 6.14 Algebraic Loops.
 - 6.15 Effects of Algebraic Loops.

- 6.16 Handling Algebraic Loops.
- 6.17 Profiling Solver Behavior.

- 7. **Developing Model Hierarchy.**
 - 7.1 Introducing Subsystems.
 - 7.2 Creating Subsystems.
 - 7.3 Handling Cross-System Gateways.
 - 7.4 Creating Visual Hierarchy.
 - 7.5 Creating Functional Hierarchy.
 - 7.6 Reducing Signal Congestion.
 - 7.7 Masking Blocks.
 - 7.8 Creating a Mask.
 - 7.9 Dialog Parameters.
 - 7.10 Mask Workspaces.
 - 7.11 Initialization Commands.
 - 7.12 The Icon Editor.
 - 7.13 Possible Icons.
 - 7.14 Block Documentation.

- 8. **Modeling Conditionally Executed Algorithms.**
 - 8.1 Block Sample Times.
 - 8.2 Types of Subsystems.
 - 8.3 Conditionally Executed Subsystems.
 - 8.4 Enabled Subsystems.
 - 8.5 Enabled Subsystems – State/Output Behavior.
 - 8.6 Triggered Subsystems.
 - 8.7 Types of Triggers.
 - 8.8 Enabled and Triggered Subsystems.

- 9. **Combining Models into Diagrams.**
 - 9.1 Subsystems and Model Referencing.
 - 9.2 Model Referencing Workflow.
 - 9.3 Defining Model Reference Inputs and Outputs.
 - 9.4 Testing the Controller Model.
 - 9.5 Referencing Models.
 - 9.6 Simulating the Model (Normal Mode).
 - 9.7 Simulating the Model (Accelerator Mode).
 - 9.8 Data Scope Considerations.
 - 9.9 Using the Model Explorer.
 - 9.10 Using the Model Workspace.
 - 9.11 Model Reference Considerations.
 - 9.12 Browsing Model Dependencies.

10. Creating Libraries

- 10.1 Block Libraries.
- 10.2 Creating New Libraries.
- 10.3 Creating Library Links.
- 10.4 Understanding Library Links.
- 10.5 Modifying Library and Reference Blocks.
- 10.6 Managing Library Links.
- 10.7 Adding Libraries to the Simulink® Library Browser.



MultiON es una empresa 100% mexicana fundada en 1989 por el ingeniero y maestro en administración Joaquín Antonio Maury González, durante sus estudios de doctorado. MultiON ES LÍDER EN México y Latinoamérica en la comercialización, soporte y capacitación de cómputo científico y técnico: software y hardware para la ciencia, la educación, la industria y los servicios.

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