PLECS SOFTWARE WORKSHOP

Modeling and Simulation of Power Electronic Systems

Tuesday March 3rd, 2020

9:00am	Registration/networking, continental breakfast, software installation
9:30am	Introduction to Plexim ▶ Who we are ▶ What we offer
9:45am	Introduction to PLECS and principles of operation ▶ PLECS Standalone and Blockset with MATLAB/Simulink integration ▶ Instantaneous switching and variable-step solvers for fast simulations ▶ Electrical, thermal, magnetic, mechanical modeling domains Exercise: Modeling a switched-mode power supply
10:45am	Break
11:00am	Solver settings ▶ Definition of stiff and non-stiff systems and related solver types ▶ Configuration settings for a variable-step solver ▶ Refining the simulation output efficiently Exercise: Solver accuracy and settings
12:30pm	Lunch (provided)
1:30pm	Introduction to thermal modeling and simulation ▶ Switching and conduction loss data entry ▶ Thermal circuit and cooling system design ▶ Junction temperature and efficiency calculations Exercise: Thermal modeling of a buck converter
2:45pm	Break
3:00pm	Control design and advanced PLECS tools ▶ Control block library for analog, digital, state machine and C-scripting ▶ Built-in steady-state and small-signal analysis tools ▶ Scripting for initialization and parameter sweeps Demos: Walkthrough of features
4:30pm	Q&A with the experts/what's coming in PLECS/feedback and requests
5:00pm	Wrap-up
RSVP	**** REQUIRED --** space is limited! ****** to Beth Silverman, silverman@plexim.com
Location	WeWork 3101 Park Blvd Palo Alto, California 94306 Please bring a laptop for hands-on exercises!

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plexim
electrical engineering software

RT BOX AND CODE GEN WORKSHOP

Real-Time Simulation and Control Development and Testing for Power Electronic Systems
Wednesday March 4th, 2020

9:00am	Registration/networking, continental breakfast, software installation
9:30am	Introduction to Plexim ▶ Who we are ▶ What we offer
9:45am	Model continuity and real-time simulation overview ▶ Motivation for model-based design and model continuity ▶ Control design stages and "in-the-loop" testing methodologies ▶ From PLECS offline models to hardware-in-the loop (HIL) testing and rapid control prototyping (RCP)
10:30am	Break
10:45am	RT Box specs and library blocks
11:15am	RT Box 101 ▶ One-model design for both offline and real-time simulation ▶ RT Box analog and digital I/O configuration ▶ PLECS Coder interface walkthrough Exercise: Introductory I/O and model discretization considerations Exercise: Real-time VSI model development in minutes
12:30pm	Lunch (provided)
1:30pm	Timing overview, step size selection, optimizations ▶ Step size and calculation time ▶ Motivation for specialized real-time switch models, examples ▶ Basic model optimization Exercise: Model optimization
2:45pm	Break
3:00pm	Automatic code generation for embedded targets ▶ One-model to simulate and generate code for closed-loop embedded control ▶ Texas Instruments (TI) C2000 microcontroller (MCU) target peripherals ▶ Real-time evaluation of MCU controls within simulation environment Demo: The merits of Processor-in-the-loop (PIL) Exercise: Hands-on code generation for a TI C2000 LaunchPad MCU
5:00pm	Q&A/wrap-up
RSVP	** REQUIRED -- space is limited! ** to Beth Silverman, silverman@plexim.com
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