

Workshop: Advanced Modeling and Simulation of Power Electronic Systems

Plexim GmbH, Zürich, June 28-30, 2010

Speakers

Dr. Wolfgang Hammer, Chief Scientist, Plexim GmbH

Dr. John Schönberger, Research & Applications Engineer, Plexim GmbH

Orhan Toker, VP Sales & Marketing, Plexim GmbH

June 28

10:00

Optional:

Introduction into PLECS

- General use of PLECS
- Instantaneous switching
- Variable and fixed step operation

Exercise: Modeling of a forward converter

12:00

Lunch

13:30

Beginning of Workshop: Welcome and Introduction

Thermal modeling of power electronic systems

- Combined electrical thermal simulation using lookup tables
- Thermal loss descriptions of conduction & switching losses
- Electrical feedback of thermal losses

Exercise: Thermal modeling of a buck converter

Exercise: Full bridge inverter thermal design

17:30

End of lectures

18:00

Get together and Workshop dinner (Please attend)

Workshop: Advanced Modeling and Simulation of Power Electronic Systems

Plexim GmbH, Zürich, June 28-30, 2010

June 29 08:30 **Numerical Simulation of Dynamic Systems**

- Stiff vs. non-stiff solvers, stability domains
 - Accuracy considerations, step-size control
 - Proper handling of discontinuities, zero-crossing detection
-

10:30 Coffee break

11:00 **Advanced features of PLECS**

- AC sweep and impulse response analysis
- Advanced modeling techniques for increasing simulation speed
- Implementing of custom components

Example: Doubly-fed induction generator

Exercise: Implementing a custom PV string model

12:30 Lunch

13:30 **Use of the C-script block**

- Function call interface
- Time settings and macros
- High speed logic emulation

Example: Space vector control of a three phase boost rectifier

15:00 Coffee break

Exercise: Implementing a digital PI controller with control delay.

Exercise: Using a state machine for sequence generation

17:30 **End of day 2**

Workshop: Advanced Modeling and Simulation of Power Electronic Systems

Plexim GmbH, Zürich, June 28-30, 2010

June 30 08:30 **Control system design and advanced modeling techniques**

- Introduction to the flyback converter
- A design flow using PLECS tools
- Use of the state-space extraction tool

Exercise: Control design for a flyback converter

10:30 Coffee break

Exercise: Control design for a flyback converter (cont)

Discussion and Outlook

End of workshop

12:30 **Lunch**

14:00 Optional discussion of custom problems

Please send ahead any subject that you would like to discuss

17:00 **End of event**

Venue

Plexim GmbH, Technoparkstr 1, Zürich

The workshop contains hands on exercises. Please bring your own computer with MATLAB/Simulink installed with you.

PLECS 3.0 licenses may be obtained ahead of the workshop from www.plexim.com.

Contact

Peter Baumann, tel: +41 44 445 2410, info@plexim.com

Cost

500.- €

Workshop: Advanced Modeling and Simulation of Power Electronic Systems

Plexim GmbH, Zürich, June 28-30, 2010

I will participate in the following events of the workshop
(please indicate and send back to us)

Day	Event	Yes	No
June 28, 10:00	Introduction into PLECS		
June 28, 12:00	Lunch		
June 28, 18:00	Workshop dinner		
June 29, 12:30	Lunch		
June 30, 12:30	Lunch		
June 30, 14:00	Optional discussion		
I have a laptop with	MATLAB/Simulink		
I have a laptop with	PLECS 3.0		
Name:			
Comments:			