

# PLECS WORKSHOP

Advanced Modeling and Simulation of Power Electronic Systems  
TU Delft, September 23<sup>rd</sup> 2025

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| 08:30    | Registration                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 09:00    | <b>Introduction to PLECS</b> <ul style="list-style-type: none"><li>▶ General use of PLECS Blockset and PLECS Standalone</li><li>▶ Instantaneous switching</li><li>▶ Variable and fixed-step operation</li></ul> Exercise: Modeling a switched-mode power supply                                                                                                                                                                      |
| 10:30    | Break                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 11:00    | <b>Solver Settings</b> <ul style="list-style-type: none"><li>▶ Definition of stiff and non-stiff systems</li><li>▶ Explicit and non-explicit solvers</li><li>▶ Stability domains</li><li>▶ Accuracy considerations, step size control</li><li>▶ Proper handling of discontinuities, zero-crossing detection</li></ul>                                                                                                                |
| 12:00    | Lunch                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 13:00    | <b>Introduction to Thermal Simulation</b> <ul style="list-style-type: none"><li>▶ Switching &amp; conduction loss descriptions</li><li>▶ Combined electrical-thermal simulation</li><li>▶ Determining loss values from data sheets</li></ul> Exercise: Thermal modeling of a buck converter                                                                                                                                          |
| 14:30    | Break                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 15:00    | <b>Bringing Simulation and Real Hardware Together<br/>(Code Generation Workflow in PLECS)</b> <ul style="list-style-type: none"><li>▶ Automatic code generation for microcontrollers</li><li>▶ Plant code generation for the RT Box</li><li>▶ Nanostep®, FlexArray and CPU solver engines</li><li>▶ Real-time simulation with 4ns step size for MHz switching</li></ul> Demonstration: HIL testbench with microcontroller and RT Box |
| 16:00    | Q&A                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 16:15    | End of day                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Contact  | Plexim GmbH, +41 44 533 51 00, <a href="mailto:info@plexim.com">info@plexim.com</a>                                                                                                                                                                                                                                                                                                                                                  |
| Location | TU Delft / Delft University of Technology faculty EEMCS<br>Mekelweg 4<br>Location: ESP Lab / Work-lounge<br>NL-2628 CD Delft<br>The Netherlands                                                                                                                                                                                                                                                                                      |