

Compilation of a Modelica Generated Code for Real-time Applications

The TUM Center for Combined Smart Energy Systems (CoSES) is a laboratory focused on analysis of multi-energy systems. The laboratory has a capability to emulate a small microgrid with Low Voltage Electric Distribution Grid and Three Temperature Level Bidirectional Heat Grid. These energy grids supply 4 Single-family houses and 1 Multi-family house with different distributed energy sources and loads.

The experimental microgrid is controlled through the control system developed using National Instruments technology such as VeriStand software, PXIs and NI Industrial controllers. This control system is monitoring all relevant signals in the microgrid and issues commands necessary for operating the microgrid in desired way.

In order to implement Modelica control algorithms developed in Power Hardware in the Loop (PHIL) real-time experiments, it is necessary to adapt the Modelica generated C code into compiled files suitable for executions on real-time systems. The project will develop a software for easy conversion of dynamic models and their interfaces into dynamic link libraries that can be executed on real-time targets.

Project Tasks

- 1) Analyze source code generation program that translates modelica models into C code.
- 2) Analyze adapt interfaces of the generated C code.
- 3) Develop a software that automatically adapts generated C code according to the specification and compiles into DLLs suitable for real-time execution.

Requirements

- 1) Background in Electrical Engineering or Software Engineering.
- 2) Solid background in software engineering, real-time simulation systems
- 3) Previous experience in with Modelica, Veristand or LabVIEW is preferable.
- 4) Affinity to programming and structural thinking.
- 5) Good team-player and an attitude to learn and explore new approaches.

Contact

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