

Extension of the Functional Mock-up Interface Library

The simulation of large-scale system is of interest in different areas, including smart grids. Such simulated systems are in general composed of multiple sub-models. The Functional Mock-up Interface (FMI) is a state of the art specification for the co-simulation of continuous systems. The FMI Library allows the integration of FMI models in C and C++ applications, enabling to write co-simulation algorithms in a convenient yet powerful way. Despite its origins in the automotive area in which co-simulation setups usually only include small numbers of models, the FMI is also applicable for the simulation of larger-scaled systems like smart grids. Among other features, the FMI provides the possibility to run multiple simulation instances of a single model. The FMI Library does not support this feature, a setback for simulations using large numbers of models. This thesis proposes different ways to implement instance handling in the FMI Library. Example simulations demonstrate the performance gain the use of these implementation extensions can provide in large-scale simulations.