Current research -overview-
Co-simulation environment

The need

“Software intensive systems” complexity

Modelling + Simulation of “system under design”

Correct level of abstraction

Heterogeneous formalisms
Co-simulation environment

The need

Covered by the FMI standard
Co-simulation environment

The challenges

Master NOT standardized

- Generic master ➔
  + One-time development
  - Run-time performance

- problem-specific master ➔
  + Perfectly adapted to the setup
  - Manual coded, error prone, laborious

Automatic generation
Approach
Transformations
Future work

➢ Measure performance generic vs. Problem-specific

➢ Extend the compiler capabilities :
  ▪ Variable stepsize
  ▪ Simulation of discrete-event submodels
  ▪ Multiple threads of execution
Future research topic
Model management

System model

Stimuli → Control → Plant

Model repository

FMU1 → FMU2 → FMU3

Analyse model

Analyse

Co-simulatie model

FMU1
0.1

FMU2
0.5

FMU3
0.2
Future research topic
Model management

Capturing analysis to use as input

Model repository
- # views/ # abstractions of one subsystem component
- Consistency between models

Framework
- System model + analysis model → co-sim model
- Detection of stubs/monitors
- Master algorithm generation

Merging FMUs and HW specific aspects
Questions?