IBPSA Project 1

International Building Performance Simulation Association

New and upcoming developments BuildingSystems library

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Web Meeting, 13/14 October 2020

Interactive modelling and simulation within VR environments

Objective

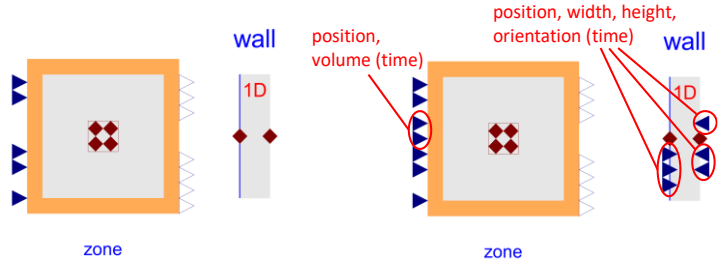
- Immersive integration of the user into the modelling and simulation workflow
- Modelling and simulation interactions over VR controller

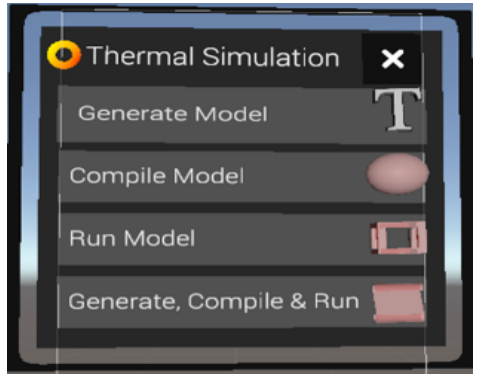
Software technology

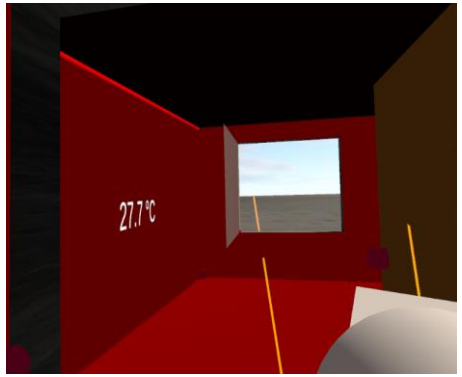
- Real-time coupling of Modelica building model and Unity 3D
  → C# wrapper for Modelica_DeviceDriver library
- Python driven workflow; Modelica and C# code generation

Library extensions

- Optional flexible component and room geometry during runtime (wall, window, door and zone models)







Immersive and interactive simulation in Virtual reality

Coupling of BuildingSystems library with openHAB

Objective

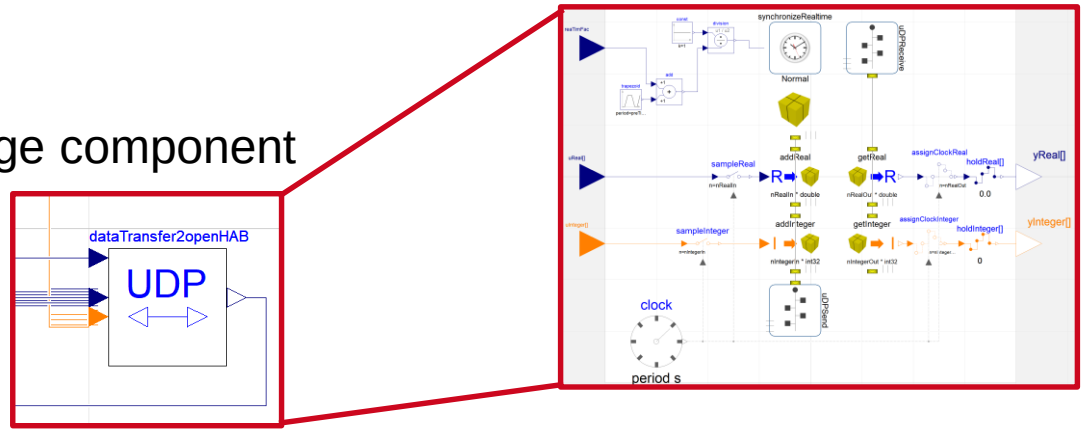
- Coupling of Modelica models with building automation software openHAB (https://www.openhab.org)
- SIL (e.g. model based evaluation of control strategies) and HIL (e.g. model based control of real devices) simulations scenarios

Software technology

- Real-time coupling of Modelica models and openHAB
  → Python wrapper for Modelica_DeviceDriver library
- use of the openHAB event bus for data exchange between Modelica and openHAB

Library extensions

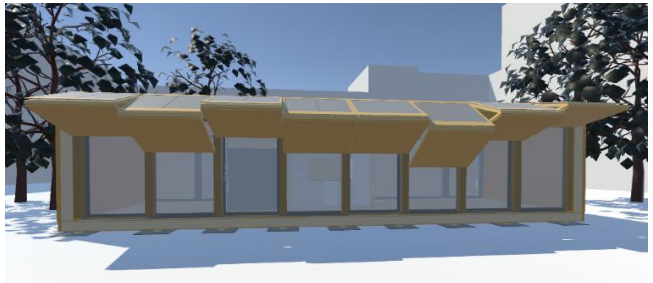
- UDP data exchange component

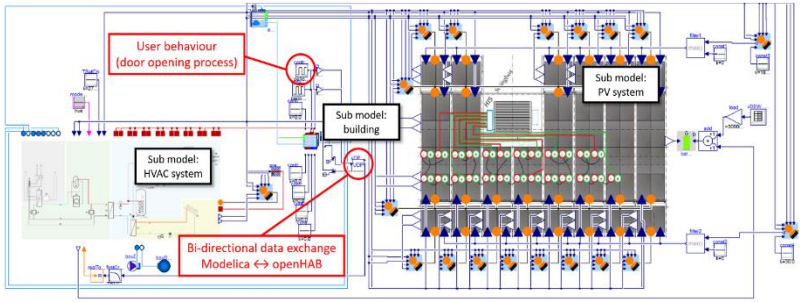


Control strategy (evaluation)

Control signals

System state





Digital twin (physical-based Modelica model) of the real energy building system

Contact

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