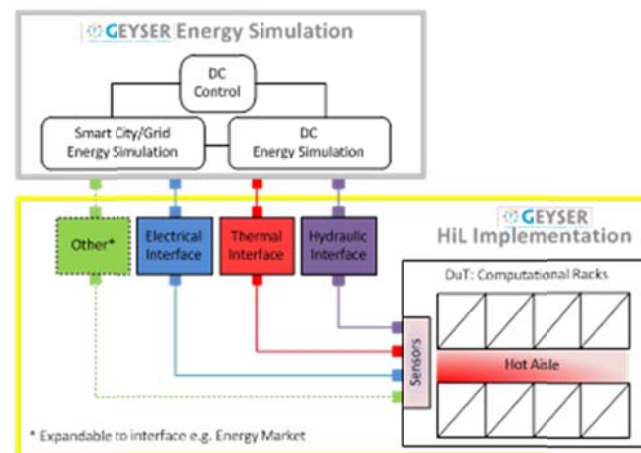


Bachelor-/ Master-Thesis

GEYSER – Data Centres in Smart Cities

Context:

Data centres have become enormous electrical power consumers, they also have to dispose of large amounts of heat. Different options exist to manage the energy demand of data centres, such as migration of computational load between different data centres, temporary reduction of the cooling power until the temperature of the server room reaches its upper boundary, temporary increase of the cooling power when there is a surplus of renewable energy generation in order to reduce the data centre CO₂ emissions or change of the internal electricity distribution to direct current for better efficiency. In a broader vision, the data centres could be integrated in the smart city adapting their energetic behavior, i.e. electrical and thermal power demand and offer, to the “needs” of the Smart City. This thesis takes place during the research of the FP7 project GEYSER, where the IT Center of RWTH Aachen University is also involved.



Materials provided to the student are:

- Data centre components models based on Modelica/SimulationX
- Implementation of data centre and Smart City Simulation

Task for a Thesis depending on interest can be:

- Detailed modelling of data centre IT Components
- Implementation of spatial load migration between data centres
- Refinement of physical model of data centre server room model (Room Size, Server Count)

- Refining data centre interaction with Smart City (Voltage Control, Frequency Control, Demand Side Management and Ancillary Services)

The student will receive an introduction in order to start quickly with the required tools. During the work the student will be supervised and advised by the research associates of the Institute.

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