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Fachgebiet Dynamik und Betrieb technischer Anlagen

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Unser Zeichen:
KWT 9

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Subject: Bachelor's Thesis

Linking and Online Execution of Existing C, C++ and Fortran Routines in MOSAICmodeling

MOSAICmodeling is a free, web-based modeling, simulation, and optimization environment. It is developed at our research group. Based on a LaTeX-style entry method for algebraic and differential equations, equation systems can be built and subsequently used for simulation and optimization. Based on a steadily growing library of existing models of chemical engineering applications large-scale flowsheets, optimization problems, etc. can be built.
MOSAICmodeling provides an automatic code generation for numerous simulation and optimization environments. Moreover, there are several numerical analysis tools, esp. solvers, available. These currently consist of C and C++ libraries as well as Fortran routines. The GUI frontend is a Java application. At the moment, the communication between the frontend and the libraries is handled by Pearl scripts. These scripts are outdated and not operational and need to be revised or rewritten.

Task description:

- Writing new scripts, e.g., in Python, or revising existing Pearl scripts that run continuously on a Debian server and allow to execute the analysis tools online
- Interfacing C++ libraries to make them permanently usable in the scripts
- Interfacing Fortran routines or transforming them to readable libraries to make them permanently usable in the scripts
- Writing operating instructions and a documentation on the integration of the libraries

Desired knowledge and skills:

- Experience in Fortran, C and C++ programming languages required
- Experience in the programming languages Python or Pearl desirable
- Knowledge of SQL and Debian operating system desirable

Start: As of now

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