Software Engineering meets Industrial Biotechnology: Development of a new generation laboratory control system

Interdisciplinary Project (IDP)

Project context
Experimental design, resource planning of the devices in the bioprocess laboratory and evaluation of the experimental results have so far only been carried out intuitively according to the level of education and individual knowledge of the respective scientist.

With this research project, we aim to create a software tool for scientists in bioprocess development that helps to drastically shorten development cycles in the future. This will be achieved by providing intelligent software components in areas such as knowledge-based experimental design, procedural experiment control and scheduling, parallelization and real-time data evaluation.

Your objective
Our research group works in a new, state-of-the-art biotech laboratory. A lot of effort has been put into establishing full control of all our laboratory equipment using SiLA2 and OPC-UA communication protocols. As a next step, the basis of a modular laboratory management system (LaMaS) has to be created to support the bioprocess development researcher with a powerful control interface for dynamic experimental setups.

Critical components of this software engineering project are intelligent resource allocation, handling and processing of large datasets in real-time, as well as intrinsic modularity, since a major challenge in the laboratory environment is the creation of a dynamically adjustable laboratory control system that is not hard coded for one specific experimental setup, but based on well defined sub-processes, interfaces and virtual machines or services.

Your profile
- You have past experience or high interest in software engineering
- You are proficient in either English or German
- You have previous programming experience (e.g. Python)
- You are interested in a collaborative project with VC on GitLab (ideal IDP group size of 3-4)
- You are interested in single-board computers (BeagleBone) and network communication (IoT)

Feel free to contact us for a tour through our lab!

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