SiLA Rapid Integration

SiLA Academic User Conference #2
Register: info@sila-standard.org

“Digital Integration of a Periodic Counter-Current Chromatography System with SiLA 2 using Docker on Gateway Modules”

Tessa Habich and Ferdinand Lange
Leibniz University Hannover, Institute of Technical Chemistry

“A Concept for Teaching-free Robotization of Laboratory Equipment”

Ádám Wolf,
PhD Student, Takeda

“Running Custom Automated Experiements”

Stefan Maak
Institute for Biochemistry of the University of Greifswald and member of the KIWI project

16:00-17:30 CET 31st March 2022

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Digital Integration of a Periodic Counter-Current Chromatography System with SiLA 2 using Docker on Gateway Modules

Tessa Habich and Ferdinand Lange

An important part of the biotechnological production is achieving high product yields through efficient processes. This can be realized by using continuous methods and digitization in the downstream process. Both proved to optimize various processes regarding their efficiency, reproducibility and susceptibility to errors. Even though these advantages are well known, biotechnology in the academic environment is still in the early stages of this development and needs constantly improvement.
With SiLA 2 (Standard in Lab Automation 2), we were able to digitize a periodic counter-current chromatography system and all its components in a standardized way. Using Docker containers on gateway modules to run SiLA-Services made maintaining the digital infrastructure with a graphical webservice user-friendly and easy to operate.

A Concept for Teaching-free Robotization of Laboratory Equipment

Ádám Wolf

Abstract: We propose a framework that enables a manipulator robot (mobile or stationary) to interface with laboratory equipment without requiring teaching from the user's side. For this purpose, the device manufacturer has to put an optical marker (fiducial) on the front side of the device. In the coordinate system defined by the marker, the robot actions have to be pre-defined by the manufacturer in an abstract robot-agnostic manner so that a standard manipulator with a parallel gripper can implement them. We define an abstract representation framework that enables the prescription of complex robot motions by the means of a finite number of parameters. We name these representations Robotic Action Primitives. We compose a canonic set of action elements that comprehensively cover the robotizable tasks in life science laboratories.

Running Custom Automated Experiements

Stefan Maak

The problem setting is quite common: There are several devices on a platform, which are needed for different workflows and which are automated with different proprietary interfaces. The platform includes a central robotic arm that transfers containers between the devices. The challenge is to enable biochemists to run custom automated experiments.

For this purpose, we develop a process description language (PythonLab), implemented SiLA2-servers for all devices and implement a scheduler/orchestrator, that is able to read PythonLab, schedule experiments and execute them while supervising and adaptively rescheduling them. It is a work-in-progress project. The presentation will include demonstrations how it already works in the Greifswald lab, our plans to transfer it to the TU-Berlin lab and explanation where&why SiLA2 is important in the project.

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