

Robot-Environment Interaction in the Biolab

Type: Ingenieurs-/Forschungspraxis + possibly thesis afterwards

In our group, we are working on the **next generation of biolaboratory automation**. At the intersection of electrical engineering and computer science we are tackling both the **hardware and software challenges** of this endeavour.

Biolabs contain a wide range of different machines used to carry out various processes and measurements. In order to integrate these devices into the laboratory environment, **we use robotic manipulators to handle physical process steps** that a human would otherwise take over.

In our laboratory, one device that we use is a qPCR thermocycler (as visible in the figure) that can perform “PCR tests” that have become widely known during the COVID-19 pandemic. While its **handling is self-explaining for a human, this leads to several robotic challenges** that we offer as projects.



Example ideas for projects in this context:

- Stable and aligned grasping and transport of liquid containers
- Wiping of microscope lenses with a robot
- Interaction of robot with thermocycler and other lab equipment
- ...

As visible from this description, this project deals with conceptual, hardware and software aspects of robotic lab automation. Requirements depend on the topic, but could include things like coding, 3D printing, computer vision, robotic manipulation, ... These projects put themselves especially forward for engineering students of different fields. Others are welcome to apply as well of course.

In case you're interested or you have any questions, feel free to reach out to Henning Zwirnmann:

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