

## Bachelor's/ Master's Thesis:

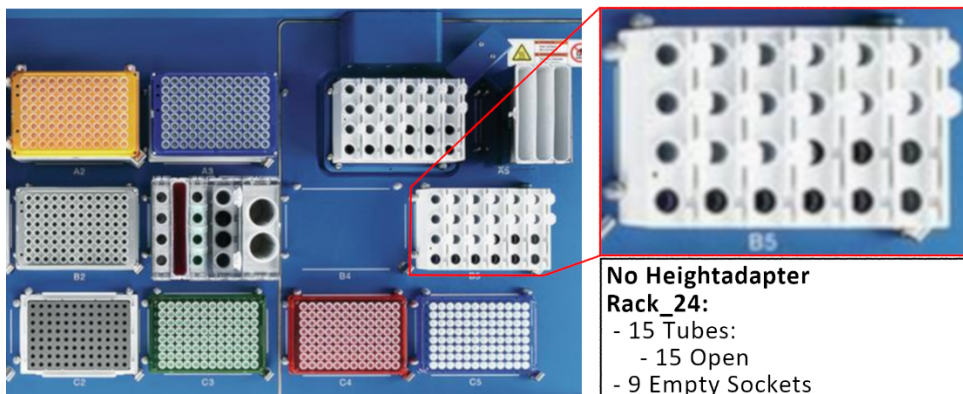
### Design and Evaluation of Convolutional Neural Networks to Verify the Deck of a Liquid Handling Robot (epMotion)

#### We are

a market leading life-science device manufacturer located in Hamburg – the Eppendorf Instrumente GmbH. We produce devices and solutions for cell, liquid and sample handling. In the growing field of laboratory automation, we develop a liquid handling robot – the epMotion 507x. Due to the large variety of objects present inside the device, one issue of current generation robots is that they are not aware of their current worktable setup. Hence, special time-consuming measurements are applied to ensure the correct worktable setup at least once.

#### We offer

thesis based challenges where you will design and train CNN Models to classify labware as well as different aspects of their configuration and benchmark them against our current models. Because these models should run on an embedded platform, a trade-off between low operation counts and small error rates should be found.



#### We require

you to have programming skills with Python 3 and at least some experience with machine learning frameworks like Keras or SciKit-Learn. Interest in machine learning, computer vision and statistics.

#### We provide

- > A working prototype with multiple cameras:
  - > >300 GB of annotated images, with an unbalanced class distribution
  - > an extendable computer vision pipeline with tools to record and annotate new data
  - > multiple classifier models and trainings parameter that serve as a baseline
- > A special machine learning server with 52 real cores, 1TB RAM and 5x Tesla V100 GPUs.
- > Experience in supervising Bachelor's and Master's Thesis.

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