Automatic Battery Assembly System (AutoBASS)

POLiS
Post Lithium Storage
Cluster of Excellence

Description

A robotic system to automatically assemble coin cells on a laboratory scale

- **Use cases**
  - Series of experiments on full cells using various electrolyte formulations
  - Investigating the performance of full cells using different electrode materials
  - Investigations targeting the cycling protocol
  - Studies requiring many and reproducibly assembled coin cells

Further information

- Correction of the components' positioning *via* image recognition
- Automatic retry if an error is detected
- Cell components need to be loaded manually

Specifications

- **Components**
  - 3 robot arms; 1 for stacking the components, 1 for dispensing electrolyte, and for placing the cell in the crimper
  - Cell crimper
  - Vacuum pump
- **Cell format**
  - CR2023
- **Maximum batch size**
  - 64 cells

Publications

[1] Zhang, B. *et al.* Robotic cell assembly to accelerate battery research. *Digital Discovery* **1**, 755–762 (2022).

[2] Zhang, B. *et al.* Apples to apples: shift from mass ratio to additive molecules per electrode area to optimize Li-ion batteries. *Digital Discovery* **3**, 1342–1349 (2024).

[3] Vogler, M., Steensen, S. K. *et al.* Autonomous Battery Optimization by Deploying Distributed Experiments and Simulations. *Adv. Energy Mater.* **14**, 2403263 (2024).