

Semester Thesis – Solder Paste Dispenser for Our Pick-and-Place Machine

Mechanical design, prototyping, and testing of a solder paste dispenser integrated into our placement head

About us

We are a young startup on a mission to reinvent electronics prototyping and make PCB prototyping faster and more efficient.

We were founded out of a hackathon in late 2025. Since we're working on a novel solution, we're currently in stealth mode and can't yet share details about our core technology.

We are supported by UnternehmerTUM, TUM Venture Labs, AI Nation, and EXIST.

01 Thesis Task & Background

You'll design, build, and test a solder paste dispenser integrated into our AI-powered pick-and-place head, next to the pick-up nozzle, so paste application and placement happen in one pass.

Your task includes:

- Designing a mechanism that doses and applies viscous solder paste in a controlled, repeatable way
- Evaluating actuation principles for precise extrusion (e.g. worm gear or crossed helical gear approach)
- Building a functional prototype and integrating it into our existing pick-and-place head
- Testing and iterating on dosing accuracy, repeatability, and reliability, and documenting your results
- Optional: Computer vision applications for self-calibration

02 You're a great fit if you...

- study Mechanical Engineering (or related) at TUM
- have solid CAD skills (SolidWorks, Creo, or similar) and a good grasp of mechanism design
- enjoy building and testing physical prototypes yourself, not just simulating them
- work independently and are excited by an open, not-yet-solved engineering problem

03 What we offer

- A real, unsolved engineering problem with direct impact on our product
- Full ownership of the mechanism design – your concept, your prototype
- Close collaboration with the founding team of an AI hardware startup

04 Details

- Semesterarbeit (ME) – TUM Chair of Machine Elements (FZG), Luis Haug (supervisor)
- On-site in Garching, working with the founding team on real hardware
- Start: immediately, flexible

05 Apply now

- Questions or want to apply? Send your CV and a short note on relevant experience to jobs@hefex-labs.com
- Our website: <https://hefex-labs.com/>