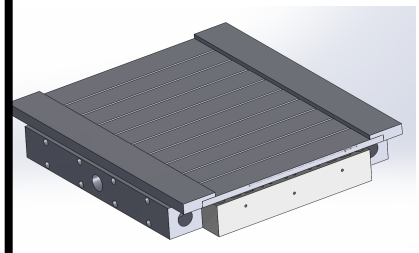
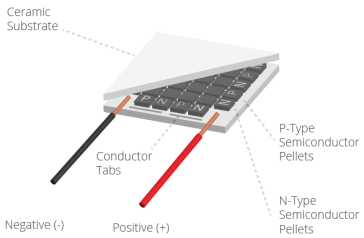
A robotic platform to study thermoregulation in ant colonies

- Ants live in environments where ambient temperature fluctuates a lot
- Social organization and collective adaptation
- **Objective:** A platform that can dynamically generate arbitrary heat maps with high precision

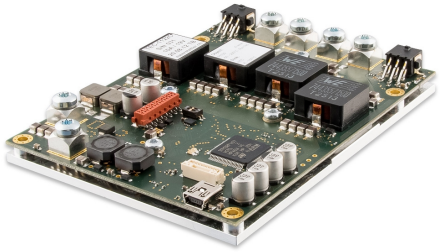
Mechanical Design and Thermodynamic Analysis





- Development of a digitally-controlled heat pad with an array of Peltier elements mounted on a water-cooled platform
  - ➢ CAD design
  - ➢ Isolation and regulation of heat

Electronics



- Design and development of printed circuit boards to power Peltier elements with dynamically regulated current values
  - ➢ PCB design (Altium Designer)
  - ➢ Integration of electronic components

Programming

- Building closed-loop control schemes for automatic regulation of temperature using tracking data as a feedback
  - ➢ C programming language

Contact Information:

Fazil Emre Uslu

fazil.uslu@epfl.ch