

Master's Thesis

Open Source Software for large solar thermal plants



SOLID Solar Energy Systems GmbH is a solar technology company with Styrian roots specialising in a wide range of large-scale thermal solar systems applications. SOLID sells, plans, builds, delivers and installs large-scale solar systems worldwide for solar process heating and cooling, water heating, space heating, district heating feed-in and thermally driven cooling machines. Typical project sizes today are usually between 300 kW and several MW nominal heating or cooling capacity. With over 25 years of experience, we are a pioneer in solar thermal energy and a global leader in the solar industry.

RESEARCH PROJECT

The master's thesis is part of the research project "HarvestIT" (project website: www.collector-array-test.org). The project aims to develop open-source software for detailed performance and yield analysis of large-scale solar thermal plants using an automated test procedure. For this purpose, characteristic parameters are estimated from operating data based on a dynamic model to detect effects such as pollution, degradation or loss of efficiency. Project-external stakeholders are involved in the project with an open innovation approach to creating a viable tool for the entire industry.

MASTER'S THESIS

The focus is on the software implementation and further development of the test procedure D-CAT (Dynamic Collector Array Test), which was developed as a proof of concept in previous projects. Validated measurement data for method and software development are available.

Tasks

- Dynamic modelling of test plants, implementation of parameter estimation, analysis and fine-tuning of optimisation algorithms, interpretation of results
- Validation and interpretation of results
- Design and implementation of the web interface

We offer

- Paid master's thesis
- Mention as a contributor to the open-source project
- Intensive support; involvement in a participative, multidisciplinary team
- Exchange with industry partners, the possibility of online participation in IEA SHC Task 68
- If desired, a cooperative master's thesis together with a master's student from our project partner AEE INTEC is possible.

We expect

- Current enrolment in a master's program focusing on control engineering, physics, statistics, software development, energy engineering or similar.
- Experience with software development / Python
- Good knowledge of English (CEFR B2 level or equivalent)

WORK PLAN

Planned duration: 6 months, September/October 2022 or asap

Location: Graz (Austria) / Home-Office

CONTACT

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