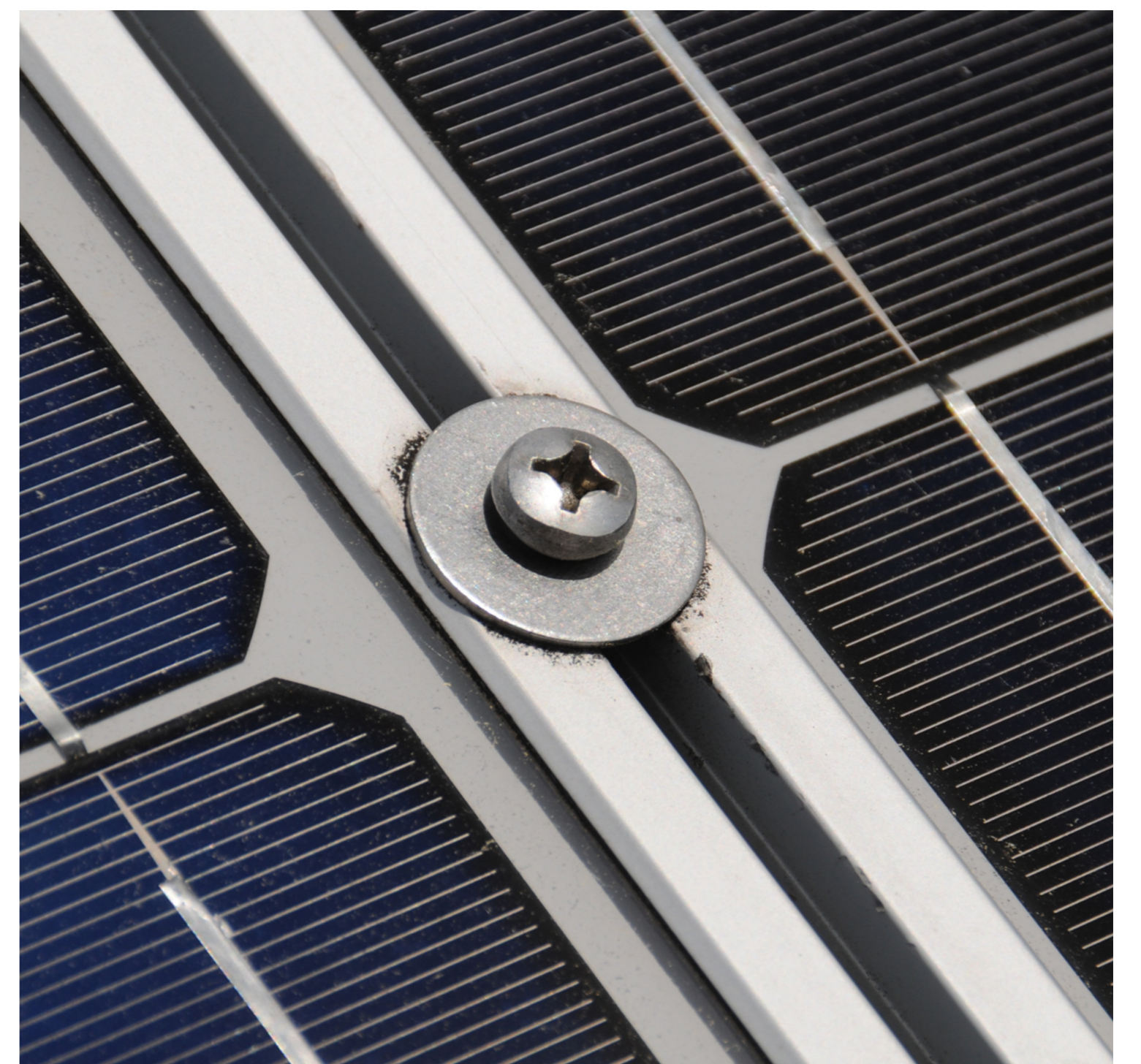**Bachelor's thesis in Energy Systems Engineering**

# Optimization oportunities for PV systems' performace estimations





**Optimisation opportunities for PV systems' performance estimations by comparison of pre- and post-installation data across countries with software simulations**

Siemens provides its customers PV solutions amongst its wide range of offerings. This solution is offered to reduce carbon footprint, increase self-production, and leverage the content of services like data acquisition for monitoring performance over the lifetime. For this offer, Siemens, as part of the solution development, runs software simulations in order to estimate electrical production, carbon footprint among other and ensure that the solution meets the guaranteed requirements for the company and the customer.

The aim of this Bachelor Thesis is to find optimisation opportunities to achieve more accurate pre-construction estimation of

electrical production and carbon footprint for PV solutions. As a basis for the research, literature research was done on the technical aspects of the simulations, photovoltaic systems and simulation software.

Methods were developed for data collection and filtering by using data analytics to minimise errors of datasets. Simulation software, weather sources and on-site measurements were put under comparative analysis to improve the accuracy of software simulations. Carbon footprint was estimated for each site.

Opportunities are recommended to improve the in-company tool for monitoring, estimation of losses and weather sources to create more accurate simulations.

**Gergely Czuczor**

Project coach:
Dr. Achim Schneider

Project expert:
André Bongard

Industrial partner:
Siemens Schweiz AG

Semester:
HS20

Image source:
© Pixabay