École Polytechnique Fédérale de Lausanne
Distributed Electrical Systems Laboratory
EPFL-STI-DESL-ELL, Station 11 CH- 1015 LAUSANNE

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ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Student project proposal

Project title All-sky camera based solar forecast

Project type ☒ MSc thesis ☒ BA semester project ☒ MSc semester project

Project responsible and e-mail
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Project description
The project is framed in the context of photovoltaic (PV) integration into the electrical grid.
It falls in the context of a wider research activity carried out in the EPFL-DESL laboratory which has the final objective of producing forecasts of the PV production using all-sky-cameras and by predicting the motion and future position of clouds.
The goal of this project is to identify suitable models to forecast solar irradiance by using an all-sky camera. All-sky pictures are captured by a dedicated imaging system which provides 180 degrees field-view of the sky in the visible spectrum. Two imaging system are available at the distributed electrical systems laboratory at EPFL, installed in the vicinity of a PV plant.
The performance of the model shall be validated by comparing them against GHI measurements provided by a pyranometer. The modeling strategies that are likely to be considered for this project are machine learning-based methods and model-based approach (like clear-sky models).

Tasks of the student

- Develop and improve a chain to detect and forecast cloud motions, based on image processing and machine-learning methods.

Requirements

- Matlab