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

http://desl-pwrs.epfl.ch

Student project proposal

Project title
Implementing Fault Location Algorithms in Python

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

Project responsible and e-mail
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Project description

Zaphiro uses different algorithms for faulted area identification and fault distance estimation based on the type of grids and types of faults. Zaphiro's algorithms are based on power system protection principles such as differential, directional and distance relaying and they are adapted to include PMUs.

The objective of this project is to continue the migration of the tools used by our R&D team towards pandapower, an open-source tool for power system modelling, analysis and optimization. The choice of pandapower is mainly driven by its relatively large user base and the support for importing the network via CGMES files.

The project structure is flexible. Its content and the expected outcomes can be tailored to the type of project.

Tasks of the student

Implement and test the following:

- An algorithm to divide the grid into smaller regions based on the position of sensors
- Algorithm for fault detection
- Algorithm for fault classification
- Algorithm for fault distance estimation

Requirements

- Strong understanding of distribution grids, especially fault analysis
- Knowledge of Python and Matlab is required, knowledge of go is a plus
- Knowledge of Pandapower and/or CGMES is a plus