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Testing Fault Location Algorithms

Project type:	☒ Semester project	☒ MSc thesis	☐ Internship
Project responsible (email):	mayank.nagendran@zaphiro.ch		

Project description and objectives:

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 the project is to generate datasets and to test the fault location approaches on several practical grids to identify gaps in the algorithms.

Tasks:

- Understand the algorithms implemented by Zaphiro for fault location
- Import the model of the electrical network and develop scripts in PowerFactory to create multiple fault scenarios
- Collect the faulty waveforms and feed them to our fault location algorithms. Collect in a structured manner the fault locator outputs.
- Analysis of the results to identify the strengths/weaknesses of each approach
- Perform a literature survey to identify remedies for the gaps

Required skills:

- Strong understanding of distribution grids, especially fault analysis
- Knowledge of Power Factory
- Knowledge of Python for scripting faults.

Other benefits and/or compensation:

About Zaphiro:

Zaphiro is an innovative smart grid company based in Lausanne, Switzerland, and Milan, Italy, that was founded in 2017 as a spin-off from EPFL and is backed by well renowned international groups such as ABB and CDP Ventures.
Our product, SynchroGuard, is the first distribution grid monitoring & automation system based on D-PMU (Distribution-Phasor Measurement Unit) technology, specifically designed to easily retrofit distribution substations and integrate with existing control room solutions (e.g., SCADA, DMS). SynchroGuard helps utilities increase grid observability, particularly in presence of high DER penetration, and improve grid resiliency by reducing the impact of blackouts on their consumers.