Student project proposal

Project title  Integration of a Phasor Measurement Unit (PMU) into a Real-Time Simulator

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

Project responsible and e-mail
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Project description
Synchrophasor measurements, performed by phasor measurement units (PMUs), are becoming increasingly important for power system network monitoring. A new compressive sensing (CS) approach has been proposed in the literature, and applied to synchrophasor measurements using a CS Taylor–Fourier (TF) multi-frequency (CSTFM) model. The validation of PMU-based real-time monitoring, protection and control applications is typically performed by means of hardware-in-the-loop setups. These usually adopt Real-Time Simulators (RTSs) to reproduce the behavior of a given electrical network and test the functionality under study in steady-state, dynamic and, also, faulted conditions. The simulation of PMUs into RTSs is typically limited by the complexity of the synchrophasor estimation algorithm.

The aim of the project is to deploy into an Opal-RT eMEGAsim PowerGrid Real-Time Digital Simulator a virtual PMU based on the CSTFM synchrophasor estimation algorithm.
Details can be found here https://infoscience.epfl.ch/record/211251 and here http://ieeexplore.ieee.org/document/7164295/

Tasks of the student
• The student will deploy into the Opal-RT eMEGAsim RTS a virtual PMU based on the CSTFM synchrophasor estimation algorithm.

Requirements
• Good Simulink programming skills.