Student project proposal

Project title  Robust synchronization methods for GPS receivers in PMU devices

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

Project responsible and e-mail
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Project description and objectives
Phasor Measurement Units (PMUs) are advanced grid monitoring devices able to provide high-speed and time-synchronized measurements of voltage and current signals. PMU time synchronization is typically achieved via GPS technology, typically coupled with a stable oscillator able to sustain temporary disconnection from the GPS system.

In this project the student is asked to develop and test an algorithm able to precisely estimate the PMU synchronization error during phases without visible GPS satellites. The main available measurement to estimate the clock drift is coming from a temperature sensor installed on the GPS receiver. The solution will be tested in a temperature-controlled environment under different conditions.

Tasks of the student
- Perform measurements of clock drift under different environmental conditions.
- Develop and implement an algorithm to estimate the clock drift during GPS disconnection phases.
- Test the resulting solution under different environmental conditions.

Required skills
- LabVIEW
- Basic metrology concepts
- Basic signal processing skills

Other benefits and/or compensation
Depending on the final project type, scope and deliverables, Zaphiro may consider providing additional adequate compensation.