Faculty of Engineering
Summer Research Program 2019/2020

Project Title: Advanced Signal Processing Techniques for Harmonic Phasor Estimation in Power Networks

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Objective
This project will explore advanced signal processing methods that will be implemented in Phasor Measurement Units installed in power distribution networks.

Project Details
Phasor measurement units (PMUs) are considered as the most promising metering infrastructure for future power networks. They allow synchronised (to UTC time reference) measurement of voltage and current phasors in various locations in power networks. Having a common time reference allows to define “phasors” and to compare them at the measured locations. Measurements in distribution networks are more contaminated with measurement noise, harmonics, and fast dynamics due to the presence of Distributed Energy Resources and power electronic converters. This makes it challenging to provide high accuracy phasor estimates in the presence of interfering signals.

This project will explore non-DFT based algorithms to estimate the parameters of a damped signal measured in power networks. In particular, Prony-based signal model will be considered and algorithms such as Matrix Pencil Method will be used to estimate the Prony model parameters.

Prerequisites
The project is best suited to students with background and interest in signal processing.

Additional Information
Potential applicants are required to attend an interview.