# Master Thesis
Time-Frequeny Analyses of Power Engineering Signals

Motivation

Power engineering signals, e.g. measurements of current and voltage, often contain, in addition to the operating frequency fundamental oscillations, harmonics that are only present for a certain time. Typical examples are high-frequency oscillations that are excited by switching operations or faults, transient processes of converter controls or harmonic loads that are only active for a certain period of time. In order to be able to separate the signals into the individual frequencies and at the same time analyse when they are active, such signals can be subjected to a time-frequency analysis in order to obtain better knowledge about the causes of the individual vibration components.
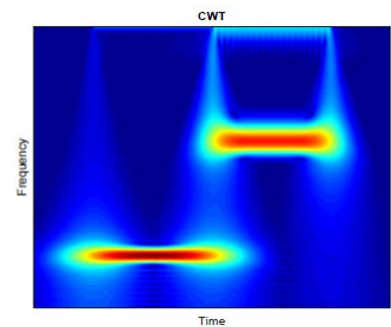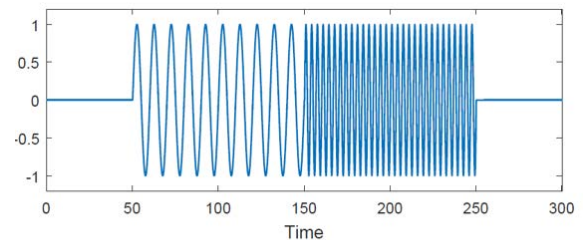
Research Topics

The central question of this work is which methods of time-frequency analysis are best suited for different power engineering signals and allow the most meaningful representation in the time-frequency domain.

Procedure/Methodology/Task definition

Real, measured energy signals are to be subjected to a time-frequency analysis using various methods. The result will then be presented in time-frequency plane and it will be examined which conclusions can be drawn from it. As a result of the work, conclusions will be drawn as to which representation is best suited for which of the investigated tasks. As time-frequency representations are considered:

- Short Time Fourier Transform
- Wavelet Transform
- Wigner distribution
- Huang-Hilbert Transform

The investigation is to be carried out with Matlab, and most of the necessary tools are already available.

Organisational Issues

Begin immediately

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