Bachelorarbeit, Masterarbeit

Adaptive Estimation and Reconstruction of Swept-Frequency-Noise in Low-Voltage Powerline Channels

Motivation
Swept-frequency-noise (SFN) is widely observed in low-voltage (LV) powerline networks, both in the in-door and the access domain. This kind of noise is characterized as narrowband interferers with periodically swept central frequencies and bandwidths, as shown in the figure below. Basically, this kind of noise is mainly caused by the active power factor correction (PFC) circuits in power supply units of various end-user appliance.

The SFN component in a noise-measurement can be easily identified and manually estimated through visual observation on the spectrogram. However, an adaptive algorithm is of full need and great interest, to detect and estimate various kinds of SFNs under different measuring scenarios.

Tasks
This work should be done in three steps:
1) setting up a general model or a class of models of SFN;
2) designing a SFN-detecting algorithm;
3) designing an adaptive estimator.

Preknowledge
- Knowledge in signal processing
- Experience with MATLAB

Research Topics
- Powerline communication
- Signal Processing
- Electromagnetic compatibility

Course of Studies
- Elektro- und Informationstechnik
- Maschinenbau
- Informatik

Start
Immediately

Duration
6 months

Links
- Supervisor’s page
- Contact
M.Sc. Bin Han
Westhochschule, Hertzstr. 16
06.35
Zimmer 114
bin.han@kit.edu
Tel.: (0721) 608 - 44517