Bachelor/Master Thesis

Chair for Theoretical Information Technology | RWTH AACHEN UNIVERSITY

On the Lattice Reduction based Detection for Faster-than-Nyquist Signalling

Research Area
Communication theory, signal detection

Keywords
5G, FTN, lattice reduction

Description
Faster-than-Nyquist (FTN) signalling has become extremely attractive in recent years as it can increase the data rate of the Nyquist signalling while preserving the bandwidth. However, the FNT signalling will bring unavoidable intersymbol interference (ISI) as a result of breaking the Nyquist criterion. Therefore, an appropriate detector is necessary for the FTN scheme. Many algorithms have been proposed to tackle this problem. Among them, the lattice reduction based method is promising as the complexity of it is relatively low.

Goal
The goal of this thesis is to investigate the FTN detectors based on different lattice reduction methods. The performance of these detectors must be compared with conventional detection techniques. And the evaluation of the lattice reduction based detectors should be made according to the simulation results.

Requirements
- Knowledge of communication theory
- Strong interests in theoretical research
- Skills in Matlab/Simulink

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