Associative Professorship of Line Transmission Technology
TUM Department of Electrical and Computer Engineering
Technical University of Munich

TUM

Ingenieurspraxis

Implementation and Evaluation of a Basic Transmission System Using the CUDA Framework

Within the scope of this topic a simulation for a very basic transmission system will be implemented utilizing a massive parallelism approach on GPUs via the CUDA framework by Nvidia. The main focus will be put on the implementation of the constellation mapping and demapping functionality as well as the implementation of a simple channel and pseudo random generation of test data. Even though none of these particular instances tends to be a bottleneck in more elaborate simulations a GPU implementation of these functionalities can be beneficial to circumvent the time consuming data transfer between CPU and GPU memory. Additionally an interface to Matlab has to be implemented for further processing of the generated results using the MEX format. A Matlab implementation of the system will be provided as a starting reference and for later comparisons. Over the course of this thesis, the student will get familiar with the following concepts: parallel programming, programming in C, using the CUDA library, code performance optimization and evaluation, stochastic simulations, constellation mapping and system performance evaluation.

Prerequisites

There are no special requirements needed to apply for this topic. Still some knowledge in the following fields is beneficial: Basics in C programming (or basics in any other programming language), Matlab (Mex)

Contact

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Advisors

Benedikt Leible