

Empirical evaluation of channel conditions in mesh networks (External, f/m/d)

Bachelor's Thesis/Master's Thesis

Project

This work is offered in cooperation with SEW EURODRIVE, department Research and Technology.

In recent decades, radio systems have become one of the most important drivers of innovation in almost all industrial sectors. They are increasingly being used in business-critical processes in which data must be transmitted reliably with low latencies. Ultra Reliable and Low Latency Communication (URLLC) is one of the pillars of 5G, which aims for latencies of approximately 1 ms with error rates of 10⁻⁵. The next generation of mobile communication (6G) is expected to achieve further improvements in the reliability and latency of the communications. The focus of this project is on innovative techniques such as cooperative radio systems and meshed network topologies. These offer cooperative approaches to intelligent resource utilization, reducing latency and increasing transmission reliability. However, the channel conditions under mesh networks have not yet been studied in detail. Knowledge of the channel in this environment can help advance novel protocols in the upper layers to be further developed.

In this project, you will investigate an empirical evaluation of channel properties in mesh networks.

Tasks

1. Familiarization with wireless networking with mesh topologies.
2. Derive a method to measure channel conditions of a mesh network.
3. Measurement setup in a real environment.
4. Analysis and evaluation of the results.

Requirements

- ✓ Study electrical engineering, computer science, mechatronics or comparable.
- ✓ Programming in a high-level language (C++, C#, Python or similar).
- ✓ Knowledge of Software Defined Radio (SDR) is an advantage
- ✓ Knowledge of mobile communications is an advantage.

Institute

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