Bachelor Thesis-Proposal:

Physical Layer Network Coding for DECT-2020-NR

DECT-2020 NR is a Radio Interface Technology (RIT) designed to provide a slim but powerful technology foundation for wireless applications deployed in various use cases and markets. It is an OFDM based RIT designed for URLLC and mMTC according to 5G (IMT-2020) requirements. It is also a promising candidate for future wireless communication. Medium access protocol in the case of DECT-2020 NR is a Time Division Multiple Access (TDMA) in which radio devices access the medium in different time slots. DECT-2020 NR supports URLLC in a star topology with scheduled time resources. In case of star topology, one radio device acts as a central device which routes packets to different radio devices in the network. Hence, the concept of physical layer network coding can be very useful for increasing the throughput of the system as well as reducing the end to end latency in a whole network. Considering the role of DECT-2020 NR in URLLC requiring use cases, this thesis aims to investigate the concepts of physical layer network coding in DECT-2020 NR for improving the throughput, and reducing the latency of the DECT network.

Tasks:

- Literature research on physical layer network coding techniques.

- Literature research on the issues and solutions to those issues (e.g. strict time synchronization techniques between the radio devices in a wireless network) in physical layer network coding.

- Selection of promising physical layer network coding techniques e.g. Discrete or Analog network coding

- Performance analysis and comparison of different chosen physical layer network coding techniques for DECT-2020 NR

- Evaluate the results in term of latency and throughput of the system

Requirements:

- Programming skills in Matlab or C++ are desirable.

- Good knowledge of wireless channel, signal processing and digital communication

- Knowledge of OFDM

- Good to have basic knowledge of network coding but not necessary

If you are interested, please contact:

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