Bachelor's Thesis

Depth Image based 5G Reliability Enhancement

Wireless channel estimation is an important topic when it comes to the reliability of the wireless communication. Up to now the estimation of the wireless channel is maintained over the pilot signal transmissions or blind estimations. However, the accuracy of these depends on the complexity of the estimation process or how frequently the pilots are transmitted. Especially in the upcoming mission critical - machine type communications (MC-MTC, i.e URLLC) the overhead of the pilots would result in inefficient usage of radio resources considering the high reliability requirement with the short packet transmissions. Hence, in this thesis the main purpose is to obtain reliable wireless channel estimations for a specific room (but dynamic environment) without requiring to use pilots. A previous work can be found in [1] which serves as a proof-of-concept, however; for industrial IOT standard using DS-SS signals. In this work the expected result is to generalize the previous work to the new 5G-NR standard which uses OFDM with many other possible configuration parameters.

[1] Serkut Ayvasik, H. Murat Gürsu, and Wolfgang Kellerer. 2019. Veni Vidi Dixi: reliable wireless communication with depth images. In Proceedings of the 15th International Conference on Emerging Networking Experiments And Technologies (CoNEXT '19). Association for Computing Machinery, New York, NY, USA, 172–185. DOI:https://doi.org/10.1145/3359989.3365418

Prerequisites

- OFDM Knowledge is required

- Wireless Channel Estimation knowledge is a plus

- Machine Learning understanding is a plus

- Medium Matlab experience is required

- C/C++ experience is a plus

Contact

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Advisors

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