

AUFGABE DER MASTERARBEIT

für: **OFFEN**

gestellt von: **Prof. Dr.-Ing. Andreas Czylwik**

Thema: Ultra-reliable short packet receiver design for industrial wireless sensor networks

This thesis will address the loss of coding gain (turbo, LDPC and convolutional codes) due to the short packet structure in industrial wireless sensor networks (IWSN). Short packets are preferred for IWSN in order to meet the strict latency requirements.

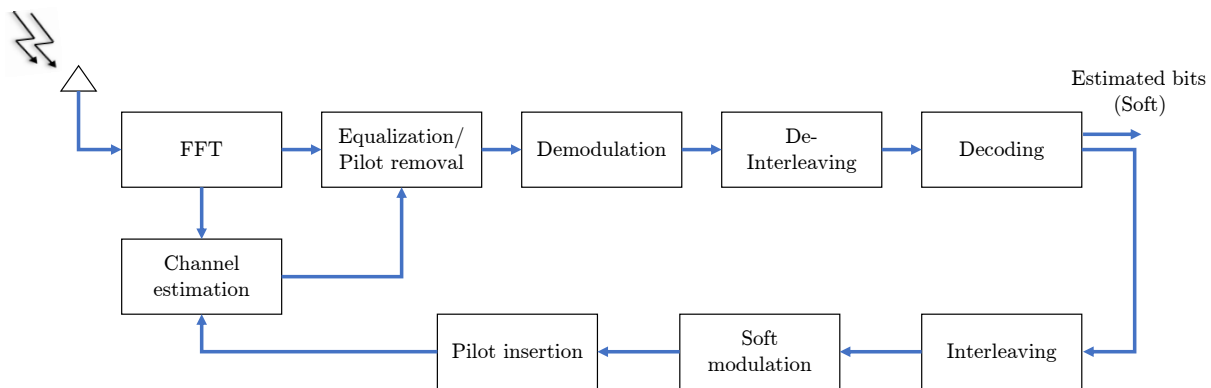


Figure 1: The proposed OFDM receiver.

The goal of this thesis is to design a robust OFDM receiver that is able to compensate the coding gain loss by utilizing an iterative channel estimation as shown in Figure 1. The decoder output, which is considered as a refined version of the received data packet, is fed-back (after interleaving and pilot tone insertion) into the channel estimator in an iterative manner aiming to increase the estimation quality.

The task entails the following:

- Creating a time and work plan,
- implementing the OFDM transmitter and the iterative receiver shown in Figure 1,
- studying the performance of the system in the case that the transmission undergoes multipath fading and noise,
- comparing the performance of the standard OFDM receiver with the proposed iterative receiver and studying the effect of different system parameters,
- documentation and final presentation of the work,
- submitting a digital copy of documentation and presentation in PDF format.

Zweitgutachter: Prof. Dr.-Ing. Jan C. Balzer

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