

Master's Thesis, Forschungspraxis

Learning Aided SC Flip Decoding for Polar Codes

Polar codes achieve the capacity of binary-input discrete memoryless channels asymptotically in the block length under successive cancellation (SC) decoding. Polar codes have been adopted for the control channel in 5G enhanced mobile broadband (eMBB).

Due to the serial nature of SC decoding, an erroneous bit decision can be caused by the channel noise or previous erroneous bit estimates. The main idea of SC flip decoding is trying to correct the first erroneous bit decision by sequentially flipping the unreliable decisions.

The optimal flipping strategy is considered difficult due to lack of an analytical solution. Alternatively, (deep) learning aided SC flip algorithm are investigated in this thesis.

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[3] X. Wang, et al. "Learning to Flip Successive Cancellation Decoding of Polar Codes with LSTM Networks." arXiv preprint arXiv:1902.08394 (2019).

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