Forced Sequence Sequential Decoding - DTU Orbit (20/10/2019)

Forced Sequence Sequential Decoding: A Concatenated Coding System with Iterated Sequential Inner Decoding

In this thesis we describe a new concatenated decoding scheme based on iterations between an inner sequentially decoded convolutional code of rate $R=1/4$ and memory $M=23$, and block interleaved outer Reed-Solomon codes with non-uniform profile. With this scheme decoding with good performance is possible as low as $Eb/No=0.6$ dB, which is about 1.7 dB below the signal-to-noise ratio that marks the cut-off rate for the convolutional code. This is possible since the iteration process provides the sequential decoders with side information that allows a smaller average load and minimizes the probability of computational overflow. Analytical results for the probability that the first Reed-Solomon word is decoded after $C$ computations are presented. This is supported by simulation results that are also extended to other parameters.

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