

ABSTRACT

Pseudo-ARQ Schemes for an LDPC Decoder

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Low-density parity-check (LDPC) codes are of great interest due to their patent-free status and their ability to achieve low error rates in noisy channels. Automatic Repeat Request (ARQ) schemes have been widely used to improve the performance of communication systems regardless of the channel coding scheme. Integrating a low-complexity ARQ scheme into an LDPC decoder, where the decoder predicts decoding failure and requests a retransmission, provides an avenue for improve the bit error rate whilst increasing the decoder's efficiency.

In this thesis, the encoding and decoding algorithms associated with LDPC codes are investigated to gain a working knowledge of these codes. Thereafter, metrics external and internal with respect to the decoder are used to detect noisy channel conditions and develop pseudo-ARQ schemes aimed at improving the bit error rate in these conditions. All the results are obtained using Mathcad.

Keywords: Pseudo-ARQ, Stopping criteria, ARQ, LDPC decoder