New Technique For Improving Performance Of LDPC Codes In The Presence
Of Trapping Sets

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Summary

Trapping sets are considered the primary factor for degrading the performance of low-density parity-check (LDPC) codes in the error-floor region. The effect of trapping sets on the performance of an LDPC code becomes worse as the code size decreases. One approach to tackle this problem is to minimize trapping sets during LDPC code design. However, while trapping sets can be reduced, their complete elimination is infeasible due to the presence of cycles in the underlying LDPC code bipartite graph. In this work, we introduce a new technique based on trapping sets neutralization to minimize the negative effect of trapping sets under belief propagation (BP) decoding. Simulation results for random, progressive edge growth (PEG) and MacKay LDPC codes demonstrate the effectiveness of the proposed technique. The hardware cost of the proposed technique is also shown to be minimal. Copyright (c) 2008 Esa Alghonaim et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

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    10.1109/TCOMM.2004.833048

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