Performance of maximum likelihood decoder in network coded cooperative communications

Khalaf, T.A.

Abstract:

Cooperative relaying is gaining a significant attention in that, intermediate relay nodes assist the source nodes to enhance the overall network efficiency. In network coded cooperative communications, the relay node linearly combines the data received from the sources and forward the linear combination to the destination. In this paper, we present the maximum likelihood decoding scheme for a network composed of two sources, single relay, and single destination. We derive a closed form expression for upper bound on the word error probability. The simulation results show that the analytical upper bound is very tight especially at higher values of the SNR. The results also show that there exists an error floor in the error probability. Therefore, the closed form expression of the upper bound is used to study the reasons of this error floor and how to mitigate it.

Keywords:

Cooperative Communications ML Decoder Multiple Sources Network Coding Relay

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