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Abstract

Energy efficient reliable wireless communication among resource constrained wireless sensor nodes is a serious challenge. In this paper, firstly, a weighted hard-input hard-output turbo product codes is presented for wireless sensor nodes to achieve the goal of low complexity with required reliability. In order to calculate each received bit’s reliability of being flipped during each iteration, we utilized four approximately independent component decoding processes to get a reliability matrix which is used to make a decision about whether the elements of the received product codes should be flipped or not. Secondly, we discuss weighted method, threshold selection strategy and complexity for the proposed weighted hard-input hard-output decoding algorithm. Simulation results prove that the proposed decoding algorithm can achieve a better tradeoff between reliability and complexity compared to conventional hard-input hard-output and soft-in soft-out decoding algorithms. At last, we analyze and simulate the energy efficiency of turbo product codes using hard-input hard-output and weighted hard-input hard-output decoding algorithm. And it is shown that the proposed scheme can make an improvement in energy efficiency for wireless sensor network.

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