Abstract

Topology control in wireless sensor networks helps to lower node energy consumption by reducing transmission power and by confining interference, collisions and consequently retransmissions. Decrease in node energy consumption implies probability of increasing network lifetime. In this paper, first popular topology control algorithms are used for analyzing optimizing the power consumption in the wireless sensor network and later proposed a novel technique wherein power consumption is traded with additional relay nodes. Later relay nodes are introduced to make the network connected without increasing the transmit power. The relay node decreases the transmit power required while it may increase end-to-end delay. This paper designs and analyzes an algorithm that place an almost minimum number of relay nodes required to make network connected. Greedy version of this algorithm is implemented and demonstrated in simulation that it produces a high quality link. InterAvg, InterMax (no of nodes that can offer interference) MinMax, and MinTotal are used as metrics to analyze and compare various algorithms. Matlab and NS-2 are used for simulation purpose.
Optimization of Wireless Sensor Network Lifetime by Deploying Relay Sensors

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**Index Terms**

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**Keywords**
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