DISTRIBUTED COOPERATIVE CLUSTER BASED COMMUNICATION PROTOCOL FOR ENERGY EFFICIENCY IN WIRELESS SENSOR NETWORKS

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ABSTRACT

Energy constraint in wireless sensor networks has received an increasing research interest in recent years. Radio irregularity, channel fading and interference results in larger energy consumption and latency for packet transmission over wireless channel. One recent technology that has the potential to dramatically increase the channel capacity and reduce transmission energy consumption in fading channels is cooperative communication. The increase in the channel capacity results in reduced error rate . In this paper, one cooperative communication technique is proposed by constructing energy efficient sending and receiving clusters for each hop. It consists of two phases namely routing phase, recruiting-and-transmitting phase. In the routing phase, the initial path between the source and the sink nodes is discovered. In the second phase, the nodes on the initial path become cluster heads, which recruit additional adjacent nodes with lowest energy cost from their neighborhood then the packet is transmitted from the sending cluster to the newly established receiving cluster. The simulation results show that the reduction in error rate and the energy savings translate into increased lifetime of cooperative networks.

KEYWORDS: Sensor Networks, Clustering, Cooperative Networks Energy-Efficient Protocols, Cooperative Transmission, Fading Channel