Increasing the Lifetime of Wireless Sensor Networks by using AR (Aggregation Routing) Algorithm

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Abstract

In this paper, we identified several advantages of a heterogeneous architecture for wireless sensor networks (WSNs). It consists of some resource rich mobile relay nodes and a many number of simple undynamic nodes. The mobile relays have high energy than the undynamic nodes. The mobile relays can dynamically move around the entire network and help relieve sensors that are highly burdened by heavy network traffic, thus improving the lifetime. We first analyze the performance of a large dense network with one mobile relay and show that network lifetime improves over that of a purely undynamic network by up to a factor of five. Also, the mobile relay needs to stay only within a two-hop radius of the sink. We then construct a AR (Aggregation Routing) Algorithm which gives a network lifetime close to the maximum limit. The benefit of this algorithm is that it only requires a minimum number of nodes in the network to be known of the location of the relay. Our simulation results show that one mobile relay can at least improve the network lifetime in a randomly deployed WSN. By comparing the mobile relay approach with various undynamic energy-provisioning methods, we explain the importance of node mobility for resource provisioning in a WSN.
Reference

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Index Terms

Computer Science Wireless Networks

Key words

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Power efficiency
search
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