Resolving Pass-Over Problem in Wireless Sensor Networks

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Abstract

In this work, we address the pass-over issue in wireless sensor network routing. Pass-over occurs when a query agent passes over an event agent even though the two lines cross each other, which may potentially prevent a query from finding the event. Even if the query and event agents eventually meet, the number of hop count may add up as a result of that. We tackle the problem with a variation of the Small-World Routing protocol (SWRP). The SWRP finds paths between the queries and events through recurrent propagations of weak and strong links. The operation of the protocol is simple and does not require much computational power. It turns out that by maximizing the number of weak link of the SWRP within a controlled area, we may be able to reduce the possibility of pass-over. In fact, according to our simulations the pass-over can be completely excluded from occurring. Accordingly, the proposed solution not only cut the number of hop-count, but also achieve better successful rate in finding a route between the query and event. The corresponding wireless sensor network with the proposed routing protocol is thus more power conservative and lasts longer.

Keyword：wireless sensor networks, pass over problem, routing protocols, small world, power saving