Multi-mobile agent itinerary planning algorithms for data gathering in wireless sensor networks: a review paper

ABSTRACT

Recently, wireless sensor networks have employed the concept of mobile agent to reduce energy consumption and obtain effective data gathering. Typically, in data gathering based on mobile agent, it is an important and essential step to find out the optimal itinerary planning for the mobile agent. However, single-agent itinerary planning suffers from two primary disadvantages: task delay and large size of mobile agent as the scale of the network is expanded. Thus, using multi-agent itinerary planning overcomes the drawbacks of single-agent itinerary planning. Despite the advantages of multi-agent itinerary planning, finding the optimal number of distributed mobile agents, source nodes grouping, and optimal itinerary of each mobile agent for simultaneous data gathering are still regarded as critical issues in wireless sensor network. Therefore, in this article, the existing algorithms that have been identified in the literature to address the above issues are reviewed. The review shows that most of the algorithms used one parameter to find the optimal number of mobile agents in multi-agent itinerary planning without utilizing other parameters. More importantly, the review showed that theses algorithms did not take into account the security of the data gathered by the mobile agent. Accordingly, we indicated the limitations of each proposed algorithm and new directions are provided for future research.

Keyword: Wireless sensor network; Data gathering; Mobile agent; Multi-agent; Itinerary planning