Wireless Networks
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Comprehensive review for energy efficient hierarchical routing protocols on wireless sensor networks

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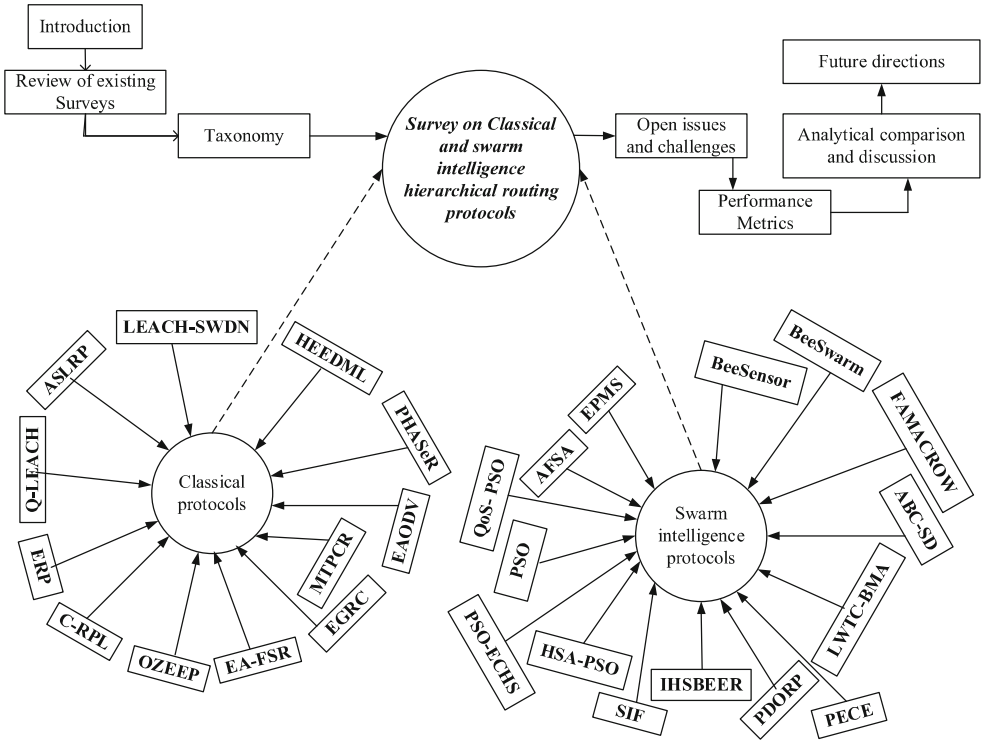
Abstract

In recent years, wireless sensor networks (WSNs) have played a major role in applications such as tracking and monitoring in remote environments. Designing energy efficient protocols for routing of data events is a major challenge due to the dynamic topology and distributed nature of WSNs. Main aim of the paper is to discuss hierarchical routing protocols in order to improve the energy efficiency and network lifetime. This paper provides a discussion about hierarchical energy efficient routing protocols based on classical and swarm intelligence approach. The routing protocols belonging to both categories can be summarized according to energy efficiency, data aggregation, location awareness, QoS, scalability, load balancing, fault tolerance, query based and multipath. A systematic literature review has been conducted for hierarchical energy efficient routing protocols reported from 2012 to 2017. This survey provides a technical direction for researchers on how to develop routing protocols. Finally, research gaps in the reviewed protocols and the potential future aspects have been discussed.

Graphical Abstract



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