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Energy efficient data gathering algorithm in hierarchical wireless sensor networks with mobile sink

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Author(s): Tashtarian, Farzad

Dept. of Comput. Eng., Ferdowsi Univ. of Mashhad, Mashhad, Iran
Moghaddam, **Mohammad Hossein Yaghmaee**; Effati, Sohrab

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ABSTRACT

One of the most critical issues in wireless sensor networks is the limited energy availability of the network nodes. This paper is investigating the advantages of using controlled sink mobility in clustered wireless sensor networks (WSNs) which increases network lifetime. In a clustered sensor network all Cluster Heads (CHs) have to transmit their buffered data to the sink during a specified interval, called data reporting time (tdr). In this paper, we propose a scheme that prescribes the sink path for collecting all CHs data in tdr time span while maximizing network life time using the mathematical model MILP (Mixed Integer Linear Programming). The proposed scheme is compared with other related schemes by means of various simulation scenarios. Simulation results show that the proposed scheme significantly outperforms other schemes.

INDEX TERMS

- **IEEE Terms**
Algorithm design and analysis , Energy efficiency , Mathematical model , Mobile communication , Mobile computing , Routing , Wireless sensor networks
- **INSPEC**
 - **Controlled Indexing**
integer programming , linear programming , mobility management (mobile radio) , wireless sensor networks
 - **Non Controlled Indexing**
MILP , WSN , cluster heads , energy efficient data gathering , hierarchical wireless sensor networks , mixed integer linear programming , mobile sink , network nodes , sink mobility
- **Author Keywords**
energy aware algorithm , mobile Sink , network's life time , wireless sensor network

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