Multiple Mobile-Sink Path Selection Technique for Wireless Sensor Networks in Efficient Manner

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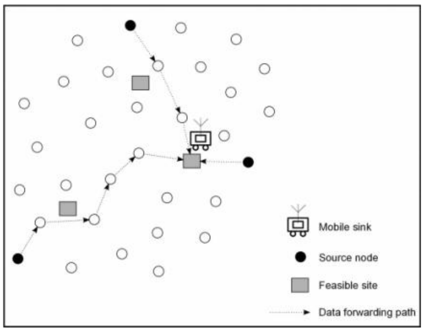
ABSTRACT-The wireless sensor network is the emerging trends nowadays to improve multiple mobile sink for data transformation an algorithm weighted rendezvous algorithm is used. In existing system mobile sink path is used with less efficiency .This system have less data transformation rate and chance for loss of scheduling data at the time of transformation in the proposed system efficiency of the data transformation be improved by using the weighted rendezvous planning algorithm. Data collection rate is improved. WRP is validated via extensive computer simulation, and our results demonstrate that WRP enables a multiple mobile sink to retrieve all sensed data within a given deadline while conserving the energy expenditure of sensor nodes. More specifically, WRP reduces energy consumption by 25% and increases network lifetime by 54%, as compared with existing algorithms.

Index Terms—Data collection, multiple mobile sinks, scheduling, wireless sensor networks (WSNs).

INTRODUCTION

WIRELESS sensor networks (WSNs) are composed of a large number of sensor nodes deployed in a field. They have wide-ranging applications, some of which include military environment monitoring agriculture home automation smart transportation and health . Each sensor node has the capability to collect and process data, and to forward any sensed data back to one or more sink nodes via their wireless transceiver in a multihop manner. In addition, it is equipped with a battery, which may be difficult or impractical to replace, given the number of sensor nodes and deployed environment. These constraints have led to intensive research efforts on designing energy-efficient protocols . This is critical as sensor nodes in dense parts of a WSN generate the highest number of packets. In multihop communications, nodes that are near a sink tend to become congested as they are responsible for forwarding data from nodes that are farther away. Thus, the closer a sensor node is to a sink, the faster its battery runs out, whereas those farther away may maintain more than 90% of their initial energy. This leads to nonuniform depletion of energy, which results in network partition due to the formation of energy holes. As a result, the sink becomes disconnected from other nodes, thereby impairing the WSN. Hence, balancing the energy consumption of sensor nodes to prevent energy holes is a critical issue in WSNs.These mobile sinks survey and collect sensed data directly from sensor nodes and thereby help sensor nodes save energy that otherwise would be consumed by multihop communications.



LITERATURE SURVEY:

Existing methods on using a mobile sink in WSNs can be grouped into two categories:
1) *direct*, where a mobile sink visits each sensor node and collects data via a single hop; and 2) *rendezvous*, where a mobile sink only visits nodes designated as RPs. The main goal of protocols in category 1 is to minimize data collection delays, whereas those in category 2 aim to find a subset of RPs that minimize energy consumption while adhering to the delay bound provided by an application. In the following, review the challenges faced by these protocols. In this paper, we propose a hybrid unconstrained movement pattern for multiple mobile sink with the aim of balancing the energy consumption of sensor nodes. The approach makes the follow-ing contributions, as compared with the work reported in the literature. The nodes that have a high degree. This is critical as sensor nodes in dense parts of a WSN generate the highest number of packets. Hence, giving priority to sensor nodes in these parts during the computation will help to reduce congestion points, and in turn, reduces energy consump-tion and improves WSN lifetime. In addition, it helps to mitigate the energy-hole problem.

DELAY-AWARE ENERGY-EFFICIENT TRAVELING PATH:

DEETP is NP-hard by a reduction from TSP. Note that the minimum energy consumption occurs when all sensor nodes are designated as an RP. This is because they do not incur any energy expenditure related to the forwarding of packets from other nodes. In this case, the goal is then to determine whether there is a tour that is not longer than $l_{\max}$. Henceforth, in the following, we propose a novel heuristic method to approximate the optimal solution.

PROBLEM STATEMENT:

An approach proposed to address this challenge is to form a hybrid moving pattern in which a mobile-sink node only visits rendezvous points (RPs), as opposed to all nodes. Sensor nodes that are not RPs forward their sensed data via multihopping to the nearest RP. The fundamental problem then becomes computing a tour that visits all these RPs within a given delay bound. Identifying the optimal tour, however, is an NP-hard problem. To address this problem, a heuristic called weighted rendezvous planning (WRP) is proposed, whereby each sensor node is assigned a weight corresponding to its hop distance from the tour and the number of data packets that it forwards to the closest RP.

SYSTEM MODELS:

Data transmission rate can be reduced by using an algorithm weighted rendezvous planning (WRP) algorithm. A WSN in which sensor nodes generate data packets periodically. Each data packet must be delivered to the sink node within a given deadline. There is a mobile sink that roams around a WSN to collect data from a set of RPs. The objective is to determine the set of RPs and associated tour that visits these RPs within the maximum allowed packet delay. Sensor nodes have a fixed data transmission range. Each sensor node produces one data packet with the length of *b* bits in time interval *D*.

PROTOCOL EXPLANATION:

DELAY-AWARE ENERGY-EFFICIENT TRAVELING PATH:

The objective is to find a tour $M = m_0, m_1, m_2, \ldots, m_n, m_0$, where $m_i \in V$, such that 1) the tour M is not longer than $l_{\max}$, and 2) the energy consumption for sending sensed data from sensor nodes to the tour M , as defined by ($E_{TX} +_{i\in V} H(i, M)$), is minimized within time interval D.

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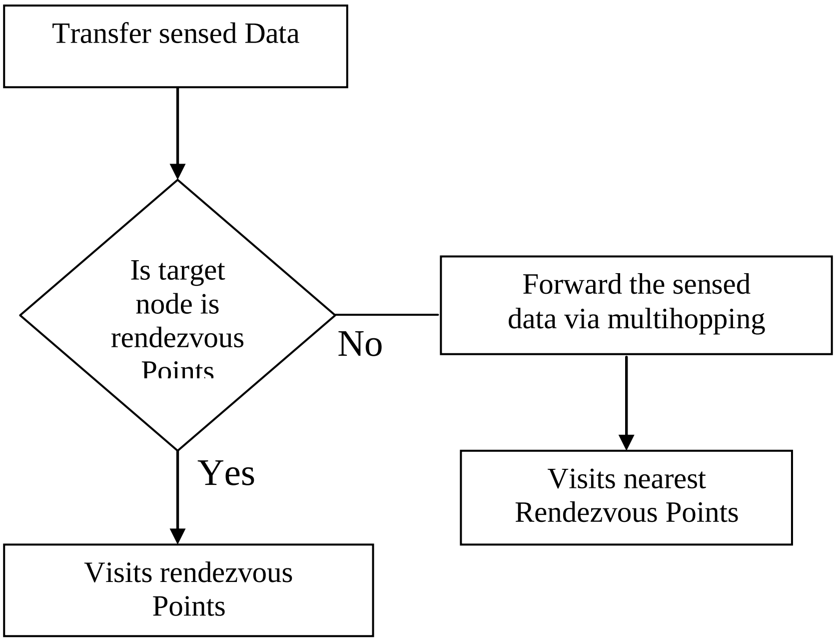

WEIGHTED RENDEZVOUS PLANNING

WRP preferentially designates sensor nodes with the highest weight as a RP. The weight of a sensor node is calculated by multiplying the number of packets that it forwards by its hop distance to the closest RP on the tour. Thus, the weight of sensor node *i* is calculated as

$$W_i = \mathrm{NFD}(i) \times H(i, M).$$

Sensor nodes that are one hop away from an RP and have one data packet buffered get the minimum weight. Hence, sensor nodes that are farther away from the selected RPs or have more than one packet in their buffer have a higher priority of being recruited as an RP.

SPECIFICATION:

The proposed system efficiency of the data transformation be improved by using the weighted rendezvous planning algorithm. Data collection rate is improved. WRP is validated via extensive computer simulation, and our results demonstrate that WRP enables a multiple mobile sink to retrieve all sensed data within a given deadline while conserving the energy expenditure of sensor nodes.

EVALUATION:

There are a maximum of 200 sensor nodes, which is reasonable for most applications. To measure network lifetime, assume that all sensor nodes have a fully charged battery with 100 J of energy. Other parameters are summarized. The mobile sink’s speed to 1 m/s. Assuming a data transmission rate of 40 Kb/s, each sensor node will be able to send 3413 data packets with a length of 30 b to the mobile sink in 20 s. This means that the mobile sink has sufficient time to drain the buffer of all sensor nodes even when there are 200 sensor nodes. To reduce the run time of RP-UG, we set L_0 to 20 m, which corresponds to the transmission range of sensor nodes.

CONCLUSION:

In this project algorithm weighted rendezvous planning (WRP) preferentially designates sensor nodes with the highest weight as a RP. The weight of a sensor node is calculated by multiplying the number of packets that it forwards by its hop distance to the closest RP on the tour. Thus, the weight of sensor node *i* is calculated. This approach is to include data with different delay requirements. This means a mobile sink is required to visit some sensor nodes or parts of a WSN more frequently than others while ensuring that energy usage is minimized, and all data are collected within a given deadline.

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