

OPTIMUM CONTROLLING OF THE SAUVE-QUI-PEUT ENERGY USING THE CAFA TECHNIQUE

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ABSTRACT

Aim: Wireless Sensor Networks (WSNs) consist of spatially spread out unique sensors to monitor several important attend able and untenable environments. The use of data in the network set of sensors is precious in the dangerous mission. Materials and methods: In the updated century, healthcare, architecture, space, mechanical, electrical and electronic industries, and so many other environments, which are small scale or large scale industries, enjoy unforeseen improvements, because of WSN. It is an excellent platform which provides ample opportunities to apply our innovative concept. Results: Real time variables are collected in a predetermined, projected and estimated way, and the observations are channelized towards the base station for further computational use. The paper analyses various real time problems which start from sensing the last process and analyses all the important protocols for the energy saving in the WSN with new CAFA (Constant Analysing Factor Agent) concept. Conclusion: The main contribution is to preserve the existing real time parameters, at the same time increasing the life span of the battery with more accuracy, improving upon the existing algorithms.

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KEY WORDS

Crowdsourcing, WSN, Data Collection, Network Constraints, Region Based Data Collection, Dynamic Region Selection.

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INTRODUCTION

Sensors can be defined in general as compact battery operated equipment's. In communication process it consumes more energy than all other computation parts. Hence, it plays an important role in conserving energy, and so researchers focus on solving such crucial issues. There should be an energy awareness at all the layers of networking protocol. The issues are common for all kinds of sensor applications. Therefore, the research on these areas mainly focused on the software-level power awareness such as dynamic region selection based CAFA technique with the low duty cycle issues, system network and analysing related issues. At the network layer, the main aim is to find ways for the energy-efficient route set up with the minimum hop, and reliable relaying of data from the sensor nodes to data and from some agent to the sink [1].

Lifetime of the network is maximized when the present algorithm is applied. Routing in the sensor networks is a very vital exercise due to the several real time characteristic values that distinguish them from the other[2]. Generally, if the automated standalone WSN is used for the large scale with limited speed, in the small scale applications like healthcare to monitor patients with complex problems, it is very important to monitor critical cases at a high speed data rate with accuracy. The data received may not be with clear output signal of the concerned category, and so, it is necessary to monitor each and every attribute, big or small, in overall Wireless Sensor Network.

OBJECTIVE

The present research shows that low utilization of energy has resulted in high output with more accuracy, and is useful under limited resources. So, analyzing the network constraints in Wireless Sensor Network is crucial. Before selecting the set of data sensor nodes, the network constraints are to be considered. Thereby the data collection will be carried out efficiently. Before selecting a sensor node for data collection, the method has to be identified, and the number of supporting nodes present in the network between the sink and sensor node have to be considered.

SCOPE

Similarly, before using the intermediate sensor nodes for the data collection, the energy constraints of the intermediate nodes have to be verified.

1. Subsequently, the data availability in the sensor node and the amount of data retrieved from the sensor have to be identified before selecting a sensor for the data collection.
2. All the results are routed to the Wireless Sensor Network for a coordinated exercise.
3. Approximate self-adaptive data collection in the Wireless Sensor Networks propose an approximate self-adaptive data collection technique, to approximately collect the data in a distributed Wireless Sensor Network.
4. The data collection investigates the spatial correlations between the sensors to provide an energy-efficient and balanced route to the sink, even though each sensor does not possess any of the global knowledge in the network.
5. Based on the synthetic experiences, the study demonstrates that data collection provides a significant communication savings and equal energy consumption in the sensor nodes.

EXISTING SYSTEM

A Feedback-Based Secure Path Approach for the Wireless Sensor Networks Data Collection in the novel tracing-feedback mechanism, makes full use of the routing functionality of the WSN, to improve the quality of the data collection [8]. The algorithms of the approach are easy to implement and perform in the WSN [3]. The approach is evaluated with a simulation experiment and the simulation results are analysed in detail. It is illustrated that the approach is efficient to support secure data collection in Wireless Sensor Network.

Optimizing Data Collection for Object Tracking in the Wireless Sensor Networks, proposed optimizing an algorithm of object tracking in Wireless Sensor Network (WSN) [4]. The task under consideration is to control the movements of a mobile sink, which has to reach a target in the shortest possible time. Utilization of the WSN resources is optimized by transferring only the selected data readings (target locations) to the mobile sink [5].

PROBLEM DEFINITION

1. Formal concept analysis is a data analysis tool, especially investigation and treatment.
2. It provides clues to discover any important information hidden in the data behind.
3. The Design of the Data Collection Methods in the Wireless Sensor Networks Based on the Formal Concept Analysis proposes data collection methods.
4. Experiments show that the proposed FCA-based data collection algorithm in the WSN is more effective than the traditional algorithm.
5. Data Collection with the Multiple Sinks in the Wireless Sensor Networks consider the Multiple-Sink Data Collection Problem in the Wireless Sensor Networks, where a large amount of data from sensor nodes need to be transmitted to one of the multiple sinks.
6. It designs an approximation algorithm to minimize the latency of data collection schedule and it gives a constant-factor performance guarantee.
7. It presents a heuristic algorithm based on the breadth first search for the problem

PROPOSED SYSTEM

Depending on the application, different structured design goals/constraints are considered for the sensor networks. The performance of a routing revised protocol is a novel idea which differs from the existing standards.

Current region selection

Region selection entirely depends upon the application. It is a fixed environment like forest fire prevention, disaster rescue and so on. If it is a static period, updating the method is important for a variety of purposes. Basically it adopts to all kinds of regions, static or dynamic [6,7]. The paper considers the dynamic region. The entire geoFigureic area is divided into smaller sections according to the network topology. The technique is applied section-wise. From the architecture, several layers will be created. The research arranges them according to the prescribed number of sensors, placing CAFA Agent node at regular intervals for analysing various real time values. These are sent to the CAFA main node via shortest path (minimum hop) for further computation.

Deployment of all the nodes

This application is sensitive, and any form of carelessness is sure to affect the performance of the entire routing protocol. The deployment is either projected or self-arranged. In the projected situations, the sensors are manually placed and the data is routed through the projected paths after a thorough investigation. In the self-organizing systems, the sensor nodes are scattered randomly for creating an infrastructure in a dynamic region splitting technique and for application of the researcher's methods. In the model, placing the CAFA node, Agent node, data node and sink node is a vital process. If the distribution of nodes, layering and placing important agent nodes at the prescribed geographical region is carried out accurately, the energy saving rate is automatically raised.

Constant Analysing Factor Agent Node (CAFA)

There are a large number of selected queries which concentrate on the particular subset and use the same types of query and analyse the route, but the paper concentrates on a different type of query. Depending on the situation, some queries are used from the algorithms grouped for the complete node participation of a network. So, a comprehensive history and current information of all the nodes are stored in an agent node at regular intervals in specific layers. This node supplies the stored information as and when required. It is an important issue because whenever network reconstruction takes place, it has to retrieve all the information about the particular node from the topmost server node. This may lead to delay causing instability in the energy utilizing process. So the paper suggests the CAFA node placement in the prescribed distance to collect information from all the leaf nodes. It practices multilevel experiment at the constant time interval to get information regarding the attributes, using the series of query processing and using the existing data report collected. At last a projected routing protocol is prepared as soon as the sensed signal reaches the particular node or each channel reaches the prescribed density of data, so that, it signals to the CAFA node. The signal will be transmitted instantly using the projected minimum hop routing protocol with the low duty cycle[9,10].

Algorithm

CAFA -Region Selection Algorithm:

Input: Null

Output: Node List Ns, Route Table Rb

Start

Initialize Node Count Nc.

Generate ACM Message. [Availability of waking node present allotted function for multi functional node]

Broadcast ACM Message.

Initialize Broadcast Timer Ti.

while Bt is running

Receive ACMREP message.

if ACMREP.DNode==True then

Add NodeIf to Node List Nc.

Nc =

Extract the route to reach the node.

Rb =

End

End

Stop.

Energy harvest based data collection

During the creation of the model, the process of setting up the experimental step is greatly influenced by the energy considerations. Since the transmission power of a wireless radio is proportional to the distance of the sensed target which is very high order in the presence of troublesome season, multi-hop routing will consume less energy than direct transmission. However, minimum/multi-hop routing introduces significant overhead for the topology management and medium access control. Direct transmission will perform effectively if it is a small area and all the nodes are near the sink. Most of the time, sensors are scattered randomly over a section of the large area and sensing becomes unavoidable.

Data aggregation is carried out with the help of the query processing, according to the density of the data from the different agent node by using the functions such as filtering (eliminating duplicates), low, high and medium. Some of these functions are performed regularly in each sensor node, by allowing the sensor nodes to conduct the decrease in network data volume due to duplication. Considerable energy savings are obtained through data

querying process. This technique is used to achieve energy utilization and to remove traffic in the number of routing protocols. In the network model, all the analytical functions are assigned to the more powerful CAFA node and the collection functions to specialized nodes. Data collection is also feasible through signal processing techniques. In that case, it is referred to as data fusion where a node is capable of producing a more accurate signal by reducing the noise and using special techniques such as beam forming to combine the proper and clear signals.

RESULTS AND DISCUSSION

The proposed CAFA model network approach for data collection is implemented and evaluated for its efficiency, using the different scenarios. The method is evaluated for its accuracy and energy saving in the data collection. The method has produced efficient results in data collection as well as in the other factors like time complexity, latency and energy efficiency with lifetime maximization.

Table: 1. Details of Simulation

Parameter	Value
Simulation Platform	Ns2
Simulation Area	1000x1000 meters
Number of nodes	240
Transmission Range	120 meters

[Table-1] demonstrates the details of the imitation being used to estimate the presentation of the proposed approach.

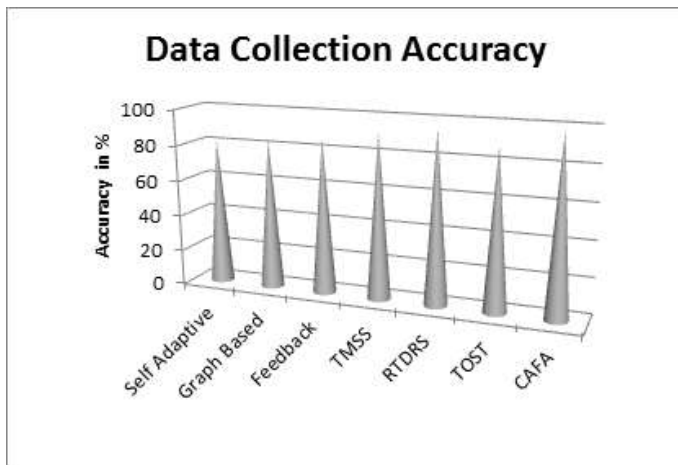


Fig: 1. Evaluation of Rule Generation Accuracy

[Figure- 1] demonstrates the Accuracy of the Data Collection, and it clearly shows that the planned approach achieves data collection with advanced accuracy than the previous approaches.

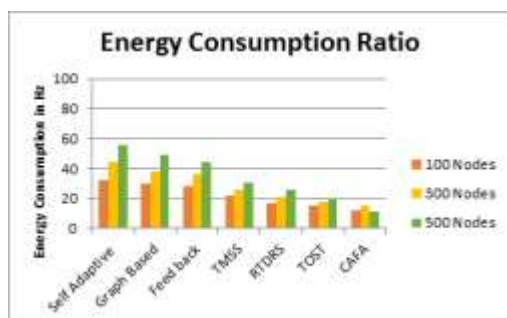


Fig: 2. Comparison of Energy Depletion Occurred

The [Figure- 2] shows that the Energy Depletion Occurred in the data collection is according to the number of nodes available in the network.

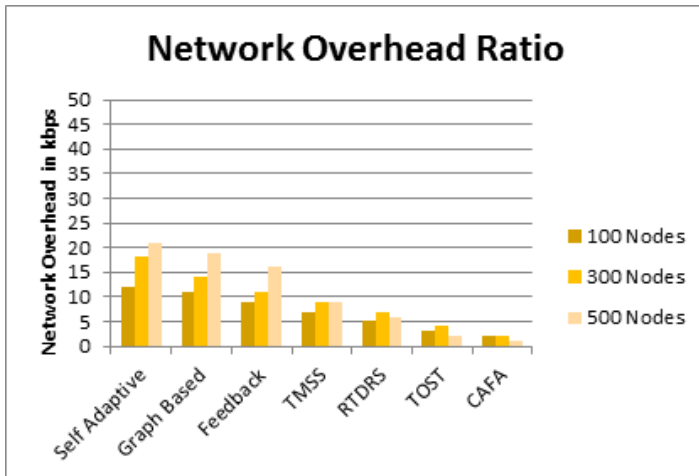


Fig: 3. Comparison of Network Overhead

[Figure- 3] shows the Comparison of the Network Overhead introduced by the different methods in collecting data from the data sensor nodes. The Figure demonstrates that the proposed method has led to less Network Overhead than the other methods.

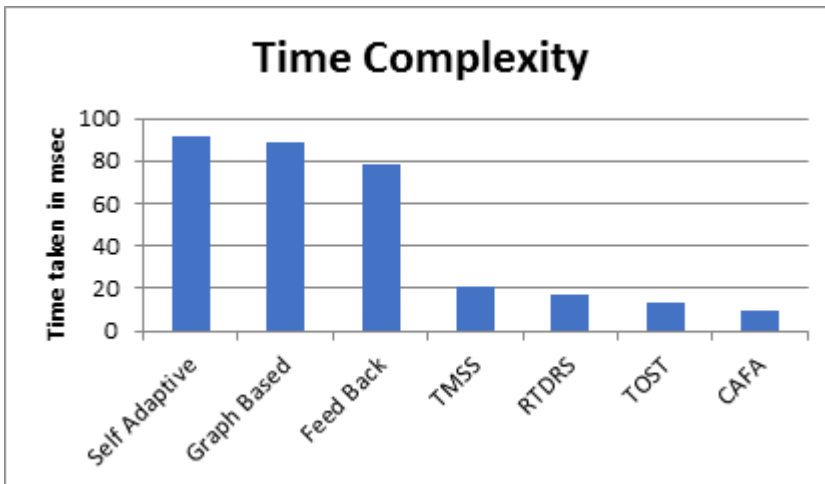


Fig: 4. Time Complexity of Different Methods

[Figure- 4] demonstrates the Time Complexity formed by various procedures in the data gathering where the number of data devices is more than 20, and it shows obviously that the proposed approach forms less time complexity than the supplementary methods.

CONCLUSION

Constant Factor Analysing Agent node technique is used for data collection in the Wireless Sensor Networks. The method computes the data available under experiential evaluation support measure and for each region. Based on

the above values, the method arrives at two different decisions, by considering the data volumes under a good sensing environment factor and the number of times the region is selected due to the availability of the required density of the data collection support. The proposed method performs an efficient data collection and improves the performance of data collection in the Wireless Sensor Network and reduces energy consumption ratio.

CONFLICT OF INTEREST

The authors declare no conflict of interests.

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Andreas R, Christian R. [2015]RoCoCo: Receiver-Initiated Opportunistic Data Collection and Command Multicasting for WSNs, Springer, Wireless Sensor Networks Lecture Notes in Computer Science. 8965:218-233.
- [2] Amir Hossein M, Mohammad Hossein Y, Vahid F. [2015] Total Data Collection Algorithm Based on Estimation Model for Wireless Sensor Network, Wireless Personal Communications. 81(2):745-778.
- [3] Chi-Fu Huang, Wei-Chen Lin. [2015] Many-to-Many Data Collection for Mobile Users in Wireless Sensor Networks, Springer, Advanced Multimedia and Ubiquitous Engineering Lecture Notes in Electrical Engineering. 352:143-148.
- [4] Nidhi G, Sanjeev S, Renu V. [2015] Data collection model for energy-efficient Wireless Sensor Networks, Springer, annals of telecommunications - annales des télécommunications.
- [5] SivrikayaF, Yener B. [2004] Time synchronization in sensor networks: a survey, Network, IEEE. 18(4):45-50.
- [6] AkyildizIF, Vuran MC. [2010] Wireless Sensor Networks. John Wiley & Sons.
- [7] Maróti M,Kusy B, Simon G, Lédeczi A. [2004] The flooding time synchronization protocol, in SenSys '04: ACM. 39-49.
- [8] Lenzen C, Sommer P,Wattenhofer R. [2009] Optimal Clock Synchronization in Networks.
- [9] Lu J, Whitehouse K. [2009] Flash flooding: Exploiting the capture effect for rapid flooding in Wireless Sensor Networks, IEEE. 2491 -2499.
- [10] Schmid T, Charbiwala Z, Anagnostopoulou Z, Srivastava MB, Dutta P. [2010] A case against routing-integrated time synchronization, ACM. 267-280.