



IJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 Issue: X Month of publication: October 2021

DOI: <https://doi.org/10.22214/ijraset.2021.38376>

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Efficient & Reliable Algorithm for Route Selection in A Wireless Sensor Networks

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Abstract: *The routing schemes in Wireless Sensor Network (WSN) systems are performed among the groups of different clusters. The node works for data aggregation from the source nodes and they also perform data dissemination and network management and events sensing and information collecting in the neighbourhood. Many clustering topologies have been proposed in recent years to localize the route within the cluster itself. In this work, it has been reviewed and compared these topologies to find out the network mechanism which is easier to manage and scalable for getting high quality response with respect to dynamics of the environment.*

I. INTRODUCTION

Wireless Sensor Networks possess a lot of sensor nodes with limited resources in terms of energy, computation and memory. They are operated by a small battery attached to it. This battery possesses little bit initial energy, and in every communication it dissipates some energy.

In as much as the energy of sensor nodes is circumscribed prolonging network lifetime in WSNs is considered to be a vital issue. Therefore, researchers must take into consideration energy consumption in routing protocols of WSNs in order to extend the network lifetime. In many routing protocols, non-uniform energy consumption and load unbalancing are the prominent problems which result in network partitioning. As a result, successful packet delivery to the sink does not take place and hence it obstructs the performance and the proper function of WSNs.

In WSNs, transmitting data packets and receiving them are considered as the main sources of energy consumption. Due to many-to-one traffic scheme, shortage of energy consumption management will result in the quick loss and destruction of energy resources of the nodes close to sink. This is referred to as energy hole problem. The periodical choice of the optimal path and the energy hole problem together affects the life time of WSNs in the majority of routing algorithms. As a result of these two issues, the network will be partitioned and the WSN will not be able to accomplish its desired function.

II. EXISTING SYSTEM

The potential for collaborative, robust networks of micro sensors has attracted a great deal of research attention.

- 1) Eugene Shihet. al. (2001), [1] first presented a hardware model for wireless sensor node and then introduce the design of physical layer aware protocols, algorithms, and applications that minimize energy consumption of the system. In Contrast to this our approach prescribes methods that can be used at all levels of the hierarchy to take advantage of the underlying hardware. This work also showed how to reduce energy consumption of non-ideal hardware through physical layer aware algorithms and protocols.
- 2) Yuping Dong et. al. (2011) [5], presented an energy efficient routing algorithm for WSN. In this algorithm, the sensor nodes are divided into several scheduling sets and let them work alternatively. In this way, the sensors do not have to be active all the time which saves a lot of energy. While choosing the next sensor forward the information to which we consider both the distance from the base station to the sensor and its current energy level. So the network power consumption will be distributed among the sensors. When the network does not have enough sensors that have sufficient energy to run, it generates new scheduling sets automatically.
- 3) J. Gnanambigai, Dr. N. Rengarajan, and K. Anbukkarasi, (2012) [6], have surveyed the state-of art of different hierarchical routing protocols that have been developed from the LEACH. This work highlights some of the drawbacks and issues in LEACH and discuss how these issues are overcome by the descendants of LEACH. This work also compare the features and performance issues of all hierarchical routing protocols.
- 4) In this work, Samira Kalantary, and Sara Taghipour, (2014), [9], presented the state of the art of WSN architecture and design features. Also, in this work, we introduce recent works on routing protocols for WSNs and their design goals and challenges. Also, an overview of the application that WSNs assist in is presented.

III. DESIGN PRINCIPLES FOR WSNS

Few basic principles have merged, which can be useful while designing networking protocols. Nonetheless, the general advice to always consider the need of a concrete application holds here as well – for each of these basic principles, there are examples where following them would result in inferior solutions.

A. Distributed Organization

Both the scalability and the robustness optimization goal, and also the other goals, make it imperative to organize a network in distributed fashion. That means that there should be no centralized entity in charge – such an entity could, for example, control medium access or make routing decisions, similar to the tasks performed by a main station in cellular mobile networks. The disadvantages of such a centralized approach are obvious as it introduces exposed points of failure and is difficult to implement in a radio network, where participants only have restricted communication coverage.

To combine the advantages, one possibility is to use centralized principles in a localized fashion by dynamically electing, out of the set of equal nodes, specific nodes that assume the responsibilities of a centralized agent, for example, to organize medium access. Such selections yield in a hierarchy, which should be dynamic: The election process should be repeated continuously lest the resources of the selected nodes be over taxed, the elected node runs out of energy, and the robustness disadvantages of such – even only localized – hierarchies manifest themselves.

B. In-network Processing

When organizing a network in shared fashion in the network nodes is not only passing on packets or executing application programs, they are also sincerely involved in taking decisions about how to operate the network. It is possible to extend this concept by also taking the concrete data that is to be transported by the network into account in this information processing, making in-network processing a first-rank design principle.

IV. PROPOSED SYSTEM

In this work Fuzzy logic based enhanced A* algorithm is used to find the optimal path from source node to destination node.

At the primary stage every node sends its components: packet reception rate, node buffer state and residual energy. Based on these components the sink node manipulates the node status by fuzzy rules for the recent routing schedule.

If the threshold energy is greater than the node status of the node it do not participate in the process and network load is balanced.

Three input based Fuzzy logic algorithm generates the node status and this used as cost heuristic function to calculate the choice of exact nodes to find optimal path. Our motive is to forward data packets to the next neighbour node which has maximum residual energy, high packet reception rate, and free buffer.

V. CONCLUSION

In this work sensor nodes network in the large-scale packet data transmission networks is considered and implemented on MATLAB programming environment. The nodes are considered with initially energized by finite and inexpensive energy source batteries with considerations of existence for a suitable time period. A schematic algorithm of elements of a sensor node is simulated that consist of detecting, computing, transmission using limited power units. It displays the communication architecture of a WSN. Each sensor node builds its results based on its mission, the information is recently has, facts of its implementing, communication, and energy resources. The node in this algorithm are simulated with assumption that they have ability to gather and forward propagate data by systematic routing approach to other neighbouring nodes and consequently to an externally placed far away main station or stations which are fixed or a mobile node with quality of connecting to the sensor network for accomplishing the ongoing communication infrastructure or to the internet. The nodes have a finite communication area and the nodes under the communication range are the neighbour nodes. Our algorithm decides the finest neighbour on the source of surrounding nodes parameters. Sensor nodes forward its confined data to those node which fulfills the node situation criteria related to nodes residual energy factor, nodes packet reaction rate standards and the nodes buffer state for deciding the next node for data propagation during creation of various hop routing from origin to sink node. We can also give considerations to the unequal energy decay situation due to node position and distance from main station to resolve the natural issue in WSNs faced by the various hop routing, and also apply this algorithm on multiple-to-single traffic model. This heterogeneous energy dissipation effects importantly decrease network lifetime hence they also need to be considered in future. We can improve this routing algorithm for the best path selection for transmission of data from source to destination by minimizing the condition of the same path selection for all communications in respect of to gain battery performance in respect of quick transmission time, and then those nodes on this path will get drained fast.



REFERENCES

- [1] Nathan İckes, Rex Min, Amit Sinha, Alice Wang, Anantha Chandrakasan "Physical Layer Driven Protocol and Algorithm Design for Energy Efficient Wireless Sensor Networks", MoBiCoMo1, July 15–21, 2001.
- [2] Gianluca Dini and İda Maria Savino, "An Algorithm for Reconnecting Wireless Sensor Network Partitions", Springer-Verlag Berlin Heidelberg 2008.
- [3] T. V. Padmavathy, and M. Chitra, "Extending the Network Lifetime of Wireless Sensor Networks Using Residual Energy Extraction—Hybrid Scheduling Algorithm", İnt. J. Communications, Network and System Sciences, 2010, 3, 98-106.
- [4] Samira Kalantary, and Sara Taghipour, "A survey on architectures, protocols, applications, and management in wireless sensor networks", Journal of Advanced Computer Science & Technology, 3 (1) (2014) 1-11.
- [5] G. Sasikumar, H. Vignesh Ramamoorthy, and S. Natheem Mohamed, "An Analysis on Animal Tracking System using Wireless Sensors", İnternational Journal of Advanced Research in Computer Science and Software Engineering, Volume 4, İssue 9, September 2014.
- [6] Ali Ghaffari, "An Energy Efficient Routing Protocol for Wireless Sensor Networks using A-star Algorithm", Journal of Applied Research and Technology, 11/09/2015.
- [7] Keyur Rana and Mukesh Zaveri, "Synthesized Cluster Head Selection and Routing for Two Tier Wireless Sensor Network", Hindawi Publishing Corporation Journal of Computer Networks and Communications, Volume 2013, Article ID 578241, 11 pages.
- [8] Uros M. Pesovic, Joze J. Mohorko, Karl Benkic, Zarko F. Cucej, "Single-hop vs. Multi-hop – Energy efficiency analysis in wireless sensor networks", Srbija, Beograd, November 23.-25., 2010.
- [9] Gowrishankar.S, T.G. Basavaraju, Manjiah D.H, Subir Kumar Sarkar, "İssues in Wireless Sensor Networks", Proceedings of the World Congress on Engineering 2008 Vol 1, WCE 2008, July 2 - 4, 2008, London, U.K.



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