INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

A REVIEW ON AN ENERGY EFFICIENT ROUTING METHOD FOR WIRELESS SENSOR NETWORK

APEKSHA A. KHANORKAR[1], PROF. DR. H. R. DESHMUKH[2]

1. Student, ME CSE, IBSS COE, Amravati, Maharashtra, India.
2. HOD, CSE, IBSS COE, Amravati Maharashtra, India.

Accepted Date: 05/03/2015; Published Date: 01/05/2015

Abstract: As an important part of industrial application (IA), the wireless sensor network (WSN) has been an active research area over the past few years. Due to the limited energy and communication ability of sensor nodes, it seems especially important to design a routing protocol for WSNs so that sensing data can be transmitted to the receiver effectively. An energy-balanced routing method based on forward-aware factor (FAF-EBRM) is proposed in this paper. In FAF-EBRM, the next-hop node is selected according to the awareness of link weight and forward energy density. Furthermore, a spontaneous reconstruction mechanism for local topology is designed additionally. In the experiments, FAF-EBRM is compared with LEACH and EEUC, experimental results show that FAF-EBRM outperforms LEACH and EEUC, which balances the energy consumption, prolongs the function lifetime and guarantees high QoS of WSN.

Keywords: Energy balance, forward-aware factor (FAF), industrial application (IA), routing, wireless sensor networks (WSNs).

Corresponding Author: MS. APEKSHA A. KHANORKAR

Access Online On:

www.ijpret.com

How to Cite This Article:

Apeksha A. Khanorkar, IJPRET, 2015; Volume 3 (9): 369-375

PAPER-QR CODE

INTRODUCTION

It is well known that wireless sensor networks (WSNs) is a self-organization wireless network system constituted by numbers of energy-limited micro sensors under the banner of industrial application (IT) .Nowadays, WSN is widely used as an effective medium to integrate physical world and information world of IA .In the sensor networks, each sensor node is both a sensor and a router, and its computing ability, storage capacity, communication ability, and power supply are limited. Therefore, the design of network topology, routing algorithm, and protocol is the most fundamental and key work in the study of the large-scale WSN communication system. In recent years, in order to balance the energy consumption and maintain coverage and connectivity, multiple mechanisms are applied to WSN topology control and routing designing. I study the large-scale WSN for static data collection and event detection under the banner of under the banner of Industrial application. It takes the balance routing of energy distribution into account. Based on the detailed analysis of the data transmission mechanism of WSN, I quantify the forward transmission area, define forward energy density, which constitutes forward-aware factor with link weight, and propose a new energy-balance routing protocol based on forward-aware factor (FAF-EBRM). Thus balances the energy consumption, prolongs the function lifetime. Networking unattended sensor nodes are expected to have significant impact on the efficiency of many military and civil applications such as combat field surveillance, security and disaster management. These systems process data gathered from multiple sensors to monitor events in an area of interest. For example, in a disaster management setup, a large number of sensors can be dropped by a helicopter. Networking these sensors can assist rescue operations by locating survivors, identifying risky areas and making the rescue crew more aware of the overall situation. Such application of sensor networks not only can increase the efficiency of rescue operations but also ensure the safety of the rescue crew.

2. LITERATURE REVIEW AND RELATED WORK

In this papers D. Zhang, [1] suggest that an energy balanced routing method FAF-EBRM based on forward aware factor. In FAF-EBRM, the next-hop node is selected according to the awareness of link weight and forward energy density. Furthermore, a spontaneous reconstruction mechanism for local topology is designed additionally. In the experiment, FAF-EBRM is compared with LEACH and EEUC, and experimental results show that FAFEBRM outperforms LEACH and EEUC, which balances the energy consumption, prolongs the function lifetime, and guarantees high QoS of WSN. Also, show that the distributions of node degree, strength, and edge weight follow power law and represent “tail,” so the topology has

robustness and fault tolerance, reduces the probability of successive node breakdown, and enhances the synchronization of WSN of IA. M. Younis [2] introduced a novel approach for energy-aware management of wireless sensor networks in this paper. A gateway node acts as a cluster based centralized network manager that setsroutes for sensor data, monitors latency throughout the cluster, and arbitrates medium access among sensors. The gateway tracks energy usage at every sensor node and changes in the mission and the environment. The gateway configures the sensors and the network to operate efficiently in order to extend the life of the network. Manasa P. [3]state that QoS in any network can be measured using the parameters such as data accuracy, aggregation delay, fault tolerance, optimum number of active sensors, coverage, energy efficiency, responsiveness, reliability, throughput, timeliness, robustness Self-Configuration Privacy and Security. In this paper, many routing protocols in Wireless Sensor Networks are discussed based on cost, security, data aggregation and QoS requirement. Efficient routing protocol controls the energy consumption of the network and they should reduce the complexity of the network. In this paper, S. Taruna[4] implemented the cluster based routing protocol which considers residual energy of nodes to extend the network lifetime, compared the heterogeneous LEACH protocol with our proposed cluster based routing protocol under same simulation conditions and values. Also considered various parameters such as packet size and Base Station position. The simulation results show that the proposed algorithm is able to prolong the network lifetime as compared to LEACH.Haibo Zhang and Hong Shen [5] suggest that energy-efficient routing is an important issue in the design of WSNs. In this paper, propose a novel energy efficient beaconless geographic routing protocol EBGR which takes advantages of both geographic routing and power-aware routing to provide loop-free, stateless, and energy-efficient sensor-to-sink routing in dynamic WSNs. Then extend EBGR to provide energy-efficient routing in lossy sensor networks. Simulation results show that protocol consumes significantly less energy than routing protocols based on neighborhood maintenance in highly dynamic scenarios.Chi-Tsun Cheng and Chi K. Tse [6] proposed a clustering algorithm based on social insect colonies has been proposed. Inspired by the structural organization of social insect colonies, an algorithm has been derived for forming and maintaining clusters in a wireless sensor network. It has been shown that the proposed decentralized clustering algorithm can improve network lifetime significantly over three well studied clustering algorithms. The performance of the proposed algorithm is shown to be robust to the distribution of sensor nodes.Quanjun Chen and Salil K.[7] proposed an accurate mathematical model that analyzes the per-node communication traffic load, the dominant source of energy consumption, in a multi-hop wireless sensor network. The results confirm that the traffic load of a node increases with the proximity to the sink. In addition, discover that the radio characterization model has a significant impact on the traffic load pattern of sensors

in the immediate vicinity of the sink.In this paper, Eylem Ekici [8] suggest a greedy distance maximization model which approximates the maximum multi hop euclide an distance in planar networks. It demonstrated that the Gaussian pdf used to model the maximum multi hop distance distribution in 1D networks does not accurately represent the planar distance distribution. Using maximum likelihood estimation of distance distributions.

3. PROPOSED WORK

Propose Methodology of Forward Aware Protocol will design in to three model such as Network model, Establishment of the Model and Design of the FAF-EBRM.

Network Model

All sensor nodes are isomorphic, and they have limited capabilities to compute, communicate and store data. The set of sensor nodes is defined as and is the total number of nodes. Here, is the identifier for a node. The energy of sensor nodes is limited, and the initial energy is stored. Nodes die after exhausting energy entirely. However, the energy of the sink node can be added. Locations of nodes and Sink do not change after being fixed, and a node cannot obtain the absolute position depend on its own location device. Nodes can vary transmission power according to the distance to its receiver. The sink node can broadcast message to all sensor nodes in the sensing field. The distance between the signal source and receiver can be computed based on the received signal strength. Regional central nodes are not selected at the beginning, on the contrary, they spring up during the topology evolution. Importance nodes have more connections, whose degree and intensity are significantly higher than neighbor nodes.

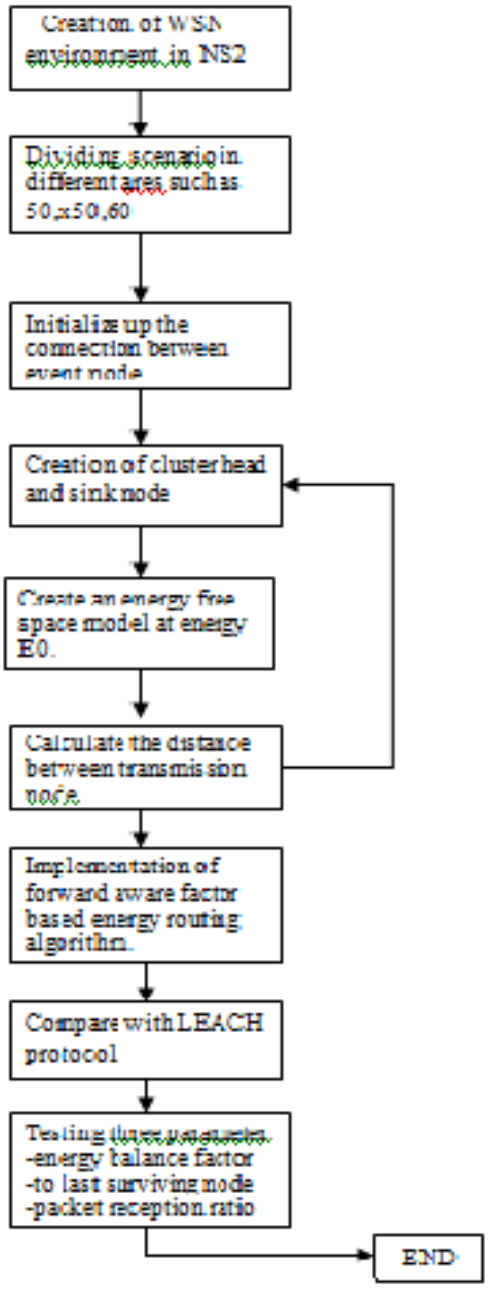
Establishment of the Model

In WSN clustered hierarchical routing protocols, sometimes nodes of a cluster are closer to the sink than the cluster head is, but it should transmit data to the head node, If this backward transmission is frequent.

Design of FAF-EBRM

A topology reconnecting mechanism of the cluster head rotation algorithm like LEACH is needed. The whole WSN information is limited, and global topology change may affect the information perception, the global change caused by energy unbalanced area is a waste of energy to energy balanced area, so a local topology reconfiguration mechanism is necessary. It is an actual deign factor.

4. FLOWCHART


Creation of WSN environment in NS2
Dividing scenario in different area such as 50,x50,60
Initialize up the connection between event node
Creation of cluster head and sink node
Create an energy free space model at energy E0.
Calculate the distance between transmission node
Implementation of forward aware factor based energy routing algorithm.
Compare with LEACH protocol
Testing (layer parameter)
-energy balance factor
-to last surviving node
-packet reception ratio
END

5. CONCLUSION

An energy-balanced routing method FAF-EBRM based on forward-aware factor is proposed in this paper. In FAF-EBRM, the next-hop node is selected according to the awareness of link weight and forward energy density. Furthermore, a spontaneous reconstruction mechanism for local topology is designed additionally. In the experiment, FAF-EBRM is compared with LEACH. Providing energy-efficient routing is an important issue in the design of WSNs. In this paper, we propose a novel energy-efficient geographic routing protocol. The flexibility, fault tolerance, high sensing fidelity, low-cost and rapid deployment characteristics of sensor networks create many new and exciting application areas for remote sensing. In the future, this wide range of application areas will make sensor networks an integral part of our lives. Now a days, the user get more aware about the energy consumption. They try to save more energy power of the device which is they are going to use. The project mainly focused on energy balancing area.so user shuarly get benefit with this approach.

5. REFERENCES

1. Degan Zhang, Member, IEEE, Guang Li, Member, IEEE, Ke Zheng, Member, IEEE, Xuechao Ming, Member, IEEE, and Zhao-Hua Pan, Member, IEEE," An Energy-Balanced Routing Method Based on Forward-Aware Factor for Wireless Sensor Networks", IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS, VOL. 10, NO. 1, FEBRUARY 2014.

2. Mohamed Younis, Moustafa Youssef, Khaled Arisha,"Energy-aware management for cluster-based sensor networks", M. Younis et al. / Computer Networks 43 (2003).

3. Manasa. S, Reshma K, Shaila, Venugopal and L M Patnaik."Qos Aware Energy Efficient Routing In Wireless Sensor Networks",Manasa ,et al., International Journal of Advanced Research in Computer Science and Software Engineering 4(6), June - 2014, pp. 1384-1388.

4. S. Taruna, Sakshi Shringi," A Cluster Based Routing Protocol for Prolonging Network Lifetime in Heterogeneous Wireless Sensor Networks",Taruna et al., International Journal of Advanced Research in Computer Science and Software Engineering 3(4), April - 2013, pp. 658-665.

5. Haibo Zhang and Hong Shen." Energy-Efficient Beaconless Geographic Routing in Wireless Sensor Networks", IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, VOL. 21, NO. 6, JUNE 2010

6. Chi-Tsun Cheng, Member, IEEE, Chi K. Tse, Fellow, IEEE, and Francis C. M. Lau, Senior Member, IEEE,"A Clustering Algorithm for Wireless Sensor Networks Based on Social Insect Colonies", IEEE SENSORS JOURNAL, VOL. 11, NO. 3, MARCH 2011

7. Quanjun Chen, Student Member, IEEE, Salil S. Kanhere, Member, IEEE, and Mahbub Hassan, Senior Member, IEEE," Analysis of Per-Node Traffic Loadin Multi-Hop Wireless Sensor Network", IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS, VOL. 8, NO. 2, FEBRUARY 2009.

8. Serdar Vural, Member, IEEE, and Eylem Ekici, Member, IEEE," On Multihop Distances in Wireless Sensor Networks with Random Node Locations", IEEE TRANSACTIONS ON MOBILE COMPUTING, VOL. 9, NO. 4, APRIL 2010.