Review on Enhance Network Stability in Wireless sensor network

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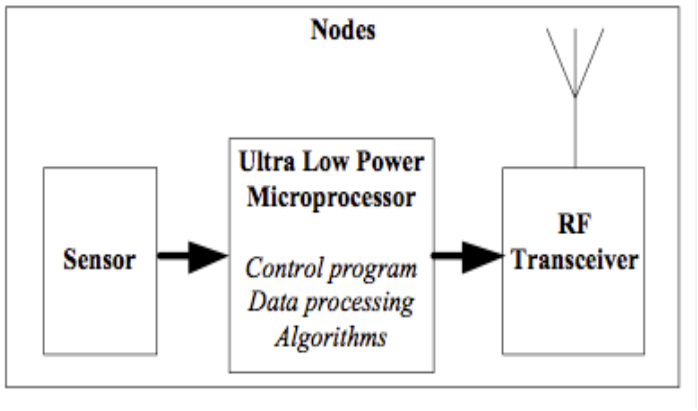
Abstract The next generation cellular wireless networks (i.e., 5G networks) A WSN is a collection of dispersed sensors collecting data to provide observability into the physical environment of some area of interest. The sensors are nodes in the network and are comprised of one or more measurement devices, computational resources, a communications component, and a finite power source (i.e. battery) . The sensors communicate information via wireless (RF) transmissions to other network elements, routing messages to other nodes or their base station, often referred to as a sink. The sink serves as the gateway between the user application and the sensor network.

Index Terms - WSN, network, energy, stability.

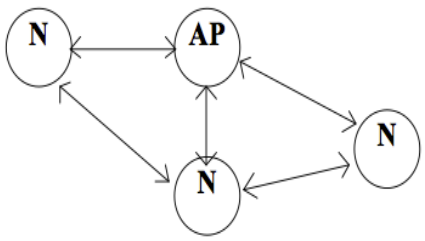
I. INTRODUCTION

Wireless Network systems are gathering popularity simply because which they offer low-cost solutions with regard to a range of request fields. The big request space connected with WSNs covers countrywide safety, security, army, healthcare, atmosphere keeping track of and the like. You will discover a couple of instances connected with WSNs, any 'homogeneous' sensor systems once the nodes in the sensor circle have the same amount of strength plus a 'heterogeneous' sensor systems each time a proportion in the node human population gives you far more strength in comparison with all of those other nodes in the very same circle.

A **Wireless Network** is a self-configuring network of small sensor nodes communicating among themselves using radio signals, and deployed in quantity to sense, monitor and understand the physical world. WSN provide a bridge between the real physical and virtual worlds. Allow the ability to observe the previously unobservable at a fine resolution over large spatio-temporal scales. Having a wide range of potential applications to industry, science, transportation, civil infrastructure, and security.



Typically, wireless sensor node consists of sensing, computing, communication, actuations and power components. These components are integrated on a single or multiple boards and packages in few cubic inches. Low power circuit and networking technologies, a sensor node powered by 2AA batteries and last upto three years with 1% low duty cycle working mode.



N: Node

After initial deployment sensor nodes are responsible for self-organizing an appropriate network structure often with multiple hop connections between sensor nodes. Location and positioning information can also be obtained by Global Positioning System or local positioning algorithm. The era of WSN's is highly anticipated in the near future.

N. Javaid et al [1], propose a novel clustering based routing technique: Enhanced Developed Distributed Energy Efficient Clustering scheme (EDDEEC) for heterogeneous WSNs. Our technique is based on changing dynamically and with more efficiency the Cluster Head (CH) election probability. Simulation results show that our proposed protocol achieves longer lifetime, stability period and more effective messages to BS than Distributed Energy Efficient Clustering (DEEC), Developed DEEC (DDEEC) and Enhanced DEEC (EDEEC) in heterogeneous environments. Wireless Sensor Networks (WSNs) consist of large number of randomly deployed energy constrained sensor nodes. Sensor nodes have ability to sense and send sensed data to Base Station (BS). Sensing as well as transmitting data towards BS require high energy. In WSNs, saving energy and extending network lifetime are great challenges. Clustering is a key technique used to optimize energy consumption in WSNs.

Shahrzad Dehghania et al [2], all well known routing algorithms based on clustering which focus on saving energy got reviewed. Each algorithm is described in detail and its pros and cons are discussed explicitly. Then some important metrics such as scalability, message overhead and algorithm complexity are used for comparing cluster-based algorithms and give an insight to challenges in this field. Wireless sensor networks are composed of limited power sensors, which their power supply could not be replaced or recharged. So, less power consumption will increase the lifetime of these networks. Therefore, providing efficient routing algorithms with less energy consumption is desirable. Among many routing algorithms, approaches based on clustering, result less energy consumption.

Feilong Tang et al [3], proposed a routing algorithm called CCM (Chain-Cluster based Mixed routing), which makes full use of the advantages of LEACH and PEGASIS, and provide improved performance. It divides a WSN into a few chains and runs in two stages. In the first stage, sensor nodes in each chain transmit data to their own chain head node in parallel, using an improved chain routing protocol. In the second stage, all chain head nodes group as a cluster in a self-organized manner, where they transmit fused data to a voted cluster head using the cluster based routing. Experimental results demonstrate that our CCM algorithm outperforms both LEACH and PEGASIS in terms of the product of consumed energy and delay, weighting the overall performance of both energy consumption and transmission delay.

R.U.Anitha amd Dr. P. Kamalakkannan [4], proposed an enhanced algorithm for Low Energy Adaptive Clustering Hierarchy–Mobile (LEACH-M) protocol called ECBR-MWSN which is Enhanced Cluster Based Routing Protocol for Mobile Nodes in Wireless Sensor Network. ECBR-MWSN protocol selects the CHs using the parameters of highest residual energy, lowest Mobility and least Distance from the Base Station. The BS periodically runs the proposed algorithm to select new CHs after a certain period of time. It is aimed to prolonging the lifetime of the sensor networks by balancing the energy consumption of the nodes. Then compare the performance of our proposed algorithm with the cluster based protocols using ns2 simulator. The simulation result indicates that the proposed algorithm gives better performance in terms of higher packet delivery ratio, throughput, energy consumption, routing overhead, and delay.

M. Aslam et al [5], present some energy efficient hierarchal routing protocols, developed from conventional LEACH routing protocol. Main focus of our study is how these extended routing protocols work in order to increase the life time and how quality routing protocol is improved for the wireless sensor network. Furthermore this paper also highlights some of the issues faced by LEACH and also explains how these issues are tackled by extended versions of LEACH. We compare the features and performance issues of each hierarchal routing protocol.

Degan Zhang et al [6], 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, FAFEBRM 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.

Bara'a A. Attea et al [7], alleviate the undesirable behavior of the EA when dealing with clustered routing problem in WSN by formulating a new fitness function that incorporates two clustering aspects, viz. cohesion and separation error. Simulation over 20 random heterogeneous WSNs shows that our evolutionary based clustered routing protocol (ERP) always prolongs the network lifetime, preserves more energy as compared to the results obtained using the current heuristics such as LEACH, SEP, and HCR protocols. Additionally, we found that ERP outperforms LEACH

and HCR in prolonging the stability period, comparable to SEP performance for heterogeneous networks with 10% extra heterogeneity but requires further heterogeneous-aware modification in the presence of 20% of node heterogeneity.

Fenye Bao et al [8], proposed a highly scalable cluster-based hierarchical trust management protocol for wireless sensor networks (WSNs) to effectively deal with selfish or malicious nodes. To demonstrate the utility of our hierarchical trust management protocol, we apply it to trust-based geographic routing and trust-based intrusion detection. For each application, we identify the best trust composition and formation to maximize application performance. Our results indicate that trust-based geographic routing approaches the ideal performance level achievable by flooding-based routing in message delivery ratio and message delay without incurring substantial message overhead. For trust-based intrusion detection, we discover that there exists an optimal trust threshold for minimizing false positives and false negatives. Furthermore, trust-based intrusion detection outperforms traditional anomaly-based intrusion detection approaches in both the detection probability and the false positive probability.

Dervis Karaboga et al [9], a novel energy efficient clustering mechanism, based on artificial bee colony algorithm, is presented to prolong the network life-time. Artificial bee colony algorithm, simulating the intelligent foraging behavior of honey bee swarms, has been successfully used in clustering techniques. The performance of the proposed approach is compared with protocols based on LEACH and particle swarm optimization, which are studied in several routing applications. The results of the experiments show that the artificial bee colony algorithm based clustering can successfully be applied to WSN routing protocols.

Nikolaos A. Pantazis et al [10], the classification initially proposed by Al-Karaki, is expanded, in order to enhance all the proposed papers since 2004 and to better describe which issues/operations in each protocol illustrate/enhance the energy efficiency issues. The routing protocols belonging to the third category can be further classified as Location-based or Mobile Agent-based. The routing protocols belonging to the fourth category can be further classified as QoS-based or Multipath based. Then, an analytical survey on energy efficient routing protocols for WSNs is provided. energy efficient routing protocols are classified into four main schemes: Network Structure, Communication Model, Topology Based and Reliable Routing. The routing protocols belonging to the first category can be further classified as flat or hierarchical. The routing protocols belonging to the second category can be further classified as Query-based or Coherent and non-coherent based or Negotiation-based.

Sudhanshu Tyagi, Neeraj Kumar [11], paper provides the taxonomy of various clustering and routing techniques in WSNs based upon metrics such as power management, energy management, network lifetime, optimal cluster head selection, multihop data transmission etc. A comprehensive discussion is provided in the text highlighting the relative advantages and disadvantages of many of the prominent proposals in this category which helps the designers to select a particular proposal based upon its merits over the others. The primary reason for this is the fact that the SNs are operated on battery which discharges quickly after each operation. It has been found in literature that clustering is the most common technique used for energy aware routing in WSNs. The most popular protocol for clustering in WSNs is Low Energy Adaptive Clustering Hierarchy (LEACH) which is based on adaptive clustering technique.

Jiguo Yua et al [12], a cluster-based routing protocol for wireless sensor networks with nonuniform node distribution is proposed, which includes an energy-aware clustering algorithm EADC and a cluster-based routing algorithm. EADC uses competition range to construct clusters of even sizes. At the same time, the routing algorithm increases forwarding tasks of the nodes in scarcely covered areas by forcing cluster heads to choose nodes with higher energy and fewer member nodes as their next hops, and finally, achieves load balance among cluster heads. Theoretical analysis and simulation results show that our protocol can balance the energy consumption among nodes and increase the network lifetime significantly.

proposed approach shows its effectiveness and proves that it works properly in diseases detection. Hossian et al [5] worked on the disease's detection and recognition on the Tea plant leaves. The detection process is done by using the support vector machine classifier. The detection process is based on the 11features for the images and later these features are used for the classification process. On the basis of image features diseases is analyzed and every time the image of leaves is uploaded into the SVM database. The uploaded image is matched with the images in the database for diseases recognition. The result of this process shows it takes less computation time with high accuracy and enhances the efficiency of detection and recognition. Shariff et al [6] presented disease detection and classification approach which is based on the weighted segmentation and feature selection. This work is based on the detection of citrus diseases in fruits. In this work firstly detection of lesion spot on the citrus fruit and leaves and after this classification of diseases is done. The lesion spots are extracted by using optimized weighted segmentation method. The effective features are selected by using the hybrid feature selection method which consist of entropy, PCA score and skewness-based covariance vector. After this process Multi class-SVM classifier is used for classification. This approach gives the high accuracy. Singh et al. [7] presented a review on the plant diseases detection techniques. This is done because diseases detection is an important part in the field of agriculture for this traditionally people observes by naked eyes but all time it is not possible to effectively classify the diseases this problem is solved by using the latest technologies. This review presented the different algorithms of machine learning and their working in diseases detection for effective accuracy. Khan et al. [8] proposed a diseases detection method by using the concept of multilevel segmentation and expectation maximization algorithm. In this work salient regions are extracted from the images by using binary partitioned tree. And it utilizes the principle of eigen vector. The accuracy of the proposed approach is higher than the existing approach.

Table.1 Existing Scheduling Model

Paper	Algorithm	parameters	Gap
Saranya, V., Shankar, S., & Kanagachidambaresan, G. R. (2018). Energy efficient clustering scheme (EECS) for wireless sensor network with mobile sink. *Wireless Personal Communications*, *100*(4), 1553-1567.	EECS algorithm is also been compared with Modified-Low Energy Adaptive Clustering Hierarchy (MODLEACH) and Gateway-based Energy-Aware multi-hop Routing protocol algorithms (MGEAR). The proposed EECS algorithm outperforms the MOD-LEACH algorithm	Throughput: improve 10% Energy: improve 14%	• Not analysis distance base cluster head • Not cluster head changing
Wang, J., Gao, Y., Liu, W., Sangaiah, A. K., & Kim, H. J. (2019). Energy Efficient Routing Algorithm with Mobile Sink Support for Wireless Sensor Networks. *Sensors*, *19*(7), 1494.	energy consumption of different routing paths to choose the optimal scenario. Then CHs are connected into a chain using the greedy algorithm for inter cluster communication. Simulation results prove the presented schema outperforms some similar work such as Cluster-Chain Mobile Agent Routing (CCMAR) and Energy-efficient Cluster-based Dynamic Routing Algorithm (ECDRA)	Throughput: improve 15% Energy: improve 12%	• Not improve energy and time delay balance • Ignore topology optimization
Yahya, A., Islam, S., Akhunzada, A., Ahmed, G., Shamshirband, S., & Lloret, J. (2018). Towards efficient sink mobility in underwater wireless sensor networks. *Energies*, *11*(6), 1471.	proposed scheme is rigorously evaluated and compared with current state-of-the-art routing protocols. The simulation of the proposed scheme shows promising results	Throughput: improve 14% Energy: improve 9%	• No improve the energy and resource efficient • Not improve the sink distance

III CONCLUSION

The routing protocols belonging to the fourth category can be further classified as QoS-based or Multipath based. Then, an analytical survey on energy efficient routing protocols for WSNs is provided. energy efficient routing protocols are classified into four main schemes: Network Structure, Communication Model, Topology Based and Reliable Routing. The routing protocols belonging to the first category can be further classified as flat or hierarchical. The routing protocols belonging to the second category can be further classified as Query-based or Coherent and non-coherent based or Negotiation-based.

IV REFERENCES

[1] Javaid, Nadeem, et al. "EDDEEC: enhanced developed distributed energy-efficient clustering for heterogeneous wireless sensor networks."*Procedia computer science* 19 (2013): 914-919.

[2] Dehghani, Shahrzad, Mohammad Pourzaferani, and Behrang Barekatain. "Comparison on Energy-efficient Cluster Based Routing Algorithms in Wireless Sensor Network." *Procedia Computer Science* 72 (2015): 535-542.

[3] Tang, Feilong, et al. "A chain-cluster based routing algorithm for wireless sensor networks." *journal of intelligent manufacturing* 23.4 (2012): 1305-1313.

[4] Anitha, R. U., and P. Kamalakkannan. "Enhanced cluster based routing protocol for mobile nodes in wireless sensor network." *Pattern Recognition, Informatics and Mobile Engineering (PRIME), 2013 International Conference on*. IEEE, 2013.

[5] Aslam, M., et al. "Survey of extended LEACH-Based clustering routing protocols for wireless sensor networks." *High Performance Computing and Communication & 2012 IEEE 9th International Conference on Embedded Software and Systems (HPCC-ICESS), 2012 IEEE 14th International Conference on*. IEEE, 2012.

[6] Zhang, Degan, et al. "An energy-balanced routing method based on forward-aware factor for wireless sensor networks." *IEEE transactions on industrial informatics* 10.1 (2014): 766-773.

[7] Bara'a, A. Attea, and Enan A. Khalil. "A new evolutionary based routing protocol for clustered heterogeneous wireless sensor networks." *Applied Soft Computing* 12.7 (2012): 1950-1957.

[8] Bao, Fenye, et al. "Hierarchical trust management for wireless sensor networks and its applications to trust-based routing and intrusion detection." *IEEE transactions on network and service management* 9.2 (2012): 169-183.

[9] Karaboga, Dervis, Selcuk Okdem, and Celal Ozturk. "Cluster based wireless sensor network routing using artificial bee colony algorithm."*Wireless Networks* 18.7 (2012): 847-860.

[10] Pantazis, Nikolaos A., Stefanos A. Nikolidakis, and Dimitrios D. Vergados. "Energy-efficient routing protocols in wireless sensor networks: A survey."*IEEE Communications Surveys & Tutorials* 15.2 (2013): 551-591.

[11] Tyagi, Sudhanshu, and Neeraj Kumar. "A systematic review on clustering and routing techniques based upon LEACH protocol for wireless sensor networks." *Journal of Network and Computer Applications* 36.2 (2013): 623-645.

[12] Yu, Jiguo, et al. "A cluster-based routing protocol for wireless sensor networks with nonuniform node distribution." *AEU-International Journal of Electronics and Communications* 66.1 (2012): 54-61.