A Brief Review on Optimal Route Evaluation Techniques for Wireless Sensor Network

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Abstract- In this era of science where networking plays a very important role in which routing in wireless sensor networks (WSN) also plays a crucial role in the field of traffic monitoring, environment-oriented monitoring. So, we can say that a huge contribution has been given by the WSN in the routing. In this paper we will focus on the literature which is analysed as the simulation environment and the experiment setup, also to spread awareness towards the Quality of Service (QOS) and the deployment. Routing is a huge area with a number of unsolved problems and hence, various research along with the future improvements have also been presented in the paper.

Keywords- WSN, Clustering over MANET, Efficient routing, Packet Delivery Ratio, Quality OfService.

I. INTRODUCTION

Wireless Sensor Network (WSN) help in working with different data packet resource and make it feasible to communication and improve the overall performance of the system[1].

Wireless sensor network consist of network nodes which works with the environmental sensor mechanism. It deal with the network sensing information scenario such as vehicle information in a traffic. The other sensor relevant information such as temperature, humidity etc also can get compute and information can be collected using wireless sensor network.

While dealing with the wireless network an important QOS factor is need to be considered. The PDR and high efficiency is expected with energy minimization over the nodes. The given previous work is also get performed with multipath routing over the useful network.

Wireless sensor network are useful in many remote areas to gather and analyse the environment scenario services.

- The WSN network help in wireless network environment information gathering and delivering them in proper usable form. To sense the temperature, weather forecast and other entity which needed for further improvements, information is provided.
- Military applications, tracking and monitoring the different area, electric surveillance and monitoring based on trigger can be done with WSN.
- Health applications, using the patient, doctor and other hospital entity related to any of the human being can be done with the wireless sensor networks.
- The monitoring of traffic system and working with the traffic light, police monitoring is also get performed using the sensor network.
- Many automation such as mechanical work, educational society and communication learning entity., use these networks.

Thus the application of wireless sensor network are highly in demand in various application areas, users are ready while taking the services of it. The following are more specific area which are rapidly using the service applications of wireless sensor network which are shown in the figure below:

APPLICATIONS OF WIRELESS SENSOR NETWORKS

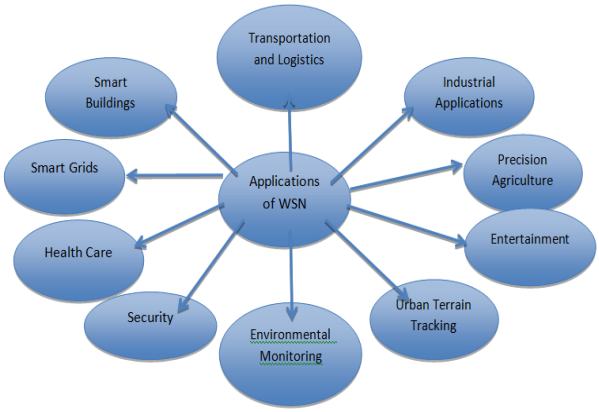

Fig.1: Shows the Applications of Wireless Sensor Networks.

II. LITERATURE SURVEY

In this section, brief introduction about the work done by various authors have been summarized.

In paper [1] examination of the major submissive recording systems suggested for WSN was carried out. The result was found to be that not a single system is energy-efficient and none of these systems implements synchronization mechanisms in the sniffers but only a single system which is named as Pimoto is able to display the information related to monitoring ina free network management tool (wireshark).Thus, an architecture was suggested for energy-efficiency of submissive recording systems for WSNs that can minimize theenergy utilization of the monitor network, and whichimplements a synchronization mechanism in the sniffers and shows all information related to monitoring using a Simple Network Management Protocol (SNMP) agent.

Paper [2] proposes a substructure for applying Software Defined Networking (SDN)to WSN management. Apart

from all advantages emphasized frompast works, more exact localization and topology discovery benefitswere added. The controller of SDN must be executed as a portion of the WSN sink.

Basically the framework comprised of two main layers- One is themiddleware which interactsalong with the network operations such as mapping, table flows, and controller applications. Second is the application layer in which localization and tracking algorithms are implemented.

Xiang et al [3] displayed newly defined energy-efficient routingmethod for the software-defined wireless sensor networks. In the routing algorithm, majority of the control nodes werealottedseparate tasks strenuously. On the other hand, they utilized non-linear particle swarm optimization algorithm for creating adesign which is clustered for minimizing the total transmission distance and for optimizing the overall usage of energy of the system. Calculated outcomes show that the suggested protocol is able toprolongthe network lifetime.

In this research work [4] presentation of a multi-dimensional energyspace based energy-decisive algorithm for wireless sensornetworks took place. In the proposed energy-decisive algorithm, the residual energy was taken into consideration and the process of inter-spacecommunication was employed. The outcome demonstrated that their findings can clearly balance energy consumption, prolong lifetime of network and extend energy efficiency.

In paper [5] an upgraded optimal route evaluation methodology dependenton the principal component approach OREPCA for wireless sensor networks is proposed. Thisapproach promises a varied measurement and accurate dynamic load balance in number of network monitoring conditions. The abilities of the mentioned breakthrough isequated with other state-of-the-art algorithms with the help of a certain criteria of implementation metrics.

Xie et al [6] presented an improvised scattered energyefficient congregatebreakthrough for WSNs. IDEEC simplified andimproved the present DEEC-like algorithms by boosting theevaluation of average energy of system also revising theprobability threshold and the cluster head assortment prospect. Outcomes show that their algorithmwas able to efficiently extend the stability time and transmitadditional ideas than DEEC and EDDEEC by minimizing thefluctuation of total of CHs. The least running time ofIEEDC also proved that their protocol can attainincreased productivity. Apart from this also they increased the dissimilarities ofthe starting energy of nodes, the outcomes also affirm that theexecution primacy of their method. Further, future work may include more crucial representation metrics for example control overhead, routing overhead and much more.

In this research work[7] derivation ofessential andadequate conditions for connectivity with coverage over a virtual composition in WSNsoccured. Along with this there was potential growth of a model based on queuing and a dynamic program to fulfil couplingrestraint overthe virtual lattice. Presentation of a formula for the optimalproblem named HCCVGA was developed, that was able to provide impreciseanswers for the MCKC complexity. Overview ofconnectivity does not affect the network lifetime to a greaterextent was perceived.

Paper [8]there is presentation of a new methodology capable of data storage and retrieval system in WSN.Basically with the help of four novel algorithms such asWOSNP, EENR, ERNR and CSDP to improve the lifespan ofWSN. These algorithms enhance the network lifespan byconservation, management and renewal of energy.

This research work [9] basically a routing breakthrough was designed named as cluster-chain mobile agent routing which is able to organize the WSN into a number of clusters and runs in two separate phases. It is inferred that the performance of the data aggregation using this protocol is strongly influenced by the underlying network topology.

Paper [10] presents a novel energy-efficient routing design dependent on SDWSN. The suggested algorithm takes benefits of centralised control and topology management in SDN, lowers the energy consumption of transmitting and accepting. Results show that the breakthrough extends the life of the network to a large extent and utilizes energy in a uniform manner.

Wang et al [11] presented an energy-efficient real-time routing algorithm EERA. In this the current residual energy was noted along with the energy consumption and overall delay.Observed calculations show that the proposed procedure has better energy-efficiency and it can be implemented with less efforts and is more adaptive to the dynamic anatomy of the lattice.

In the research work [12] an algorithm is proposed which is able to carry out adefinitive transmission of data in a WSN. Inspired from the multipath principle and also takes intoaccount all of the limitations which intake energy in accordancewith the components of sensor nodes and the distance thatbuilds separation among nodes.

III. SURVEY REPORT

Authors	Algorithm/Technique	Advantages	Disadvantages	Result
Garcia, F.P.; Andrade, R [1]	Distributed algorithm	Scattered algorithm for extendingthe lifetime of the network.	Theissue of coverage is also highly	Low Energy consumption is done by it and provides monitoring information using

			linked to the reprogramming energy consumption.	a SNMP agent.
A. D. Gante , M. Aslan, and A. Matrawy [2]	SDN to WSN management.	The SDN controller needs an implementation which is executed as portion of the WSN sink.	It is slow	WSN helps in implementing the SDN
Wei Xiang, Ning Wang and Yuan Zhou [3]	Particle Swarm Optimization Algorithm	The breakthrough developsan improved clustering composition of the system, and the control nodes arescattered more uniformly in the network.	The control nodes must be alotted numerous tasks dynamically.	Calculated Outcomes suggest that the presented protocol is able to prolong thelifetime of network.
Liao Wenxing, Wu Muqing, Wu Yuewei [4]	Energy Efficient Breakthrough developed on multi-dimensional energy space.	It can equate energy consumption, prolong grid lifespan and extend energy efficiency.	As the grid performance improves the complexity of the algorithm increases.	The projectedprocessaccomplishes more appropriately in energy equating and complexlifespansuspension.
Kui Liu, Chunfeng Wang [5]	Optimal Route Evaluation Method Based on Principal Component Approach	In this technique, the applicablepathestimationpo inter set is initially built upbuilt on the deployment environment of the network.	It is complicated for large packet transmission.	It demonstrates robustskills in terms of heftiness, adeptness and accuracy.
BenyinXie, Chaowei Wang [6]	Improved distributed energy efficient clustering algorithm (IDEEC)	IDEEC simplifies& improves the present DEEC-like algorithms by optimizing the estimation of average energy of the system and altering the probabilitythreshold and the cluster head selection possibility.	Control overhead and routing overhead need to be improvised.	Outcomes show that the procedure canefficiently extend the constancyperiod and transfer more messages than DEEC and EDDEEC by minimizing the variation of number of CHs.
Jamal N. Al-Karaki and AmjadGawanmeh [7]	M-Connected K-Coverage Optimized Set	The suggestedformula performed in line with the optimalresult.	Problem of coverage and connectivity is complex.	In the analysis, the issue of optimal connectivity along with the coverage in overall WSNs were tackled with.

Labisha R.V and Baburaj E [8]	• WOSNP • EEWR • ERNR • CSDP	All the algorithms enhanced the lifetime of the network using conservation, management and renewal of energy.	The implementation of compression of data on huge sized data was not dealt with.	The paper presented a novelapproach for informationstowage andrescuescheme in WSN with four different algorithms.
SelvakumarSasirekha and SanskaranarayanaSwamynathan [9]	Cluster-chain mobile agent based routing approach.	It makes full use of the advantages of both LEACH and PEGASIS. The WSN is organised into a few clusters.	Fault tolerance and security are major issues.	This paper presents CCMAR which outperforms various algorithms in terms of energy utilization,transmission delay and network lifespan.
Fang Junli, Wang Yamen and Shi Haibin [10]	Energy-Efficient Routing Algorithm in Controller.	It organizes distance queue which isbuilt on the data collected from the nodules and calculates the neighbouringnodule to transfer data.	Energy Efficiency can be further improvised.	Outcomes show that the algorithm is able to extend the network lifetime notably and consumes energy equally.
Qiaoling Wang and Jun Liu [11]	Particle Swarm Optimization.	PSO is used for the purpose ofoptimization within segment of assembling so as to improvise the energy-efficiency.	Real-time requirements need to be taken into account.	Energy efficiency is improved and dynamic priority is also proposed to programme inter-cluster data communication.
M.Benaddy, B.ElHabil, M.ElQuali, O.ElMeslouhi and S.Krit [12]	Construction phase and Data transmission algorithm.	The suggestedprocess is inspired from the multipath principle.	Efficiency can be improved by comparing with other protocols.	The paper presents a breakthrough for data diffusion in a WSN in a much reliable manner.

The table 1 above shows the brief about the work performed by respective authors.Thus the survey discussion help in efficient data packet transmission over wireless scenario network with energy efficiency.

IV. CONCLUSION

Wireless sensor network use different environmental information gathering and its transmission. It also plays crucial task in the field of routing, also in the field of the effective data transmission over wireless sensor networks with energy efficiency. In the paper upon discussing and observing the recent work it is further noticed that the workis done with the low packet numbers and not with the high traffic and weight given onto the nodes. Thus the observation is not monitored according to those steps. Some problem definitions are observed-

1. Optimization in weight observation and depletion is not performed.
2. Feasible path monitoring is required to be observed.

Some other parameter than PDR should be monitored to claim more accuracy of work such as packet loss and optimal energy after communication.Further work needs an improvement for efficient approach with software defined routing algorithm over wireless sensor network

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