Review Paper on Data Collection through Hybrid algorithm for WSN

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Abstract-**Groups of sensor nodes are called as sensor networks .They transmit sensed data to base station in cooperation with one another. An efficient use of power is important for increased network lifespan. Wireless sensor networks are tiny, light in weight, battery powered sensor nodes. Various parameters like clustering overhead, lifetime of network, energy hole, FND (first node dies) LND (last end dies) are optimized in WSN with the help of various proposed hybrid unequal clustering protocol. Another issue for data gathering in WSN is the hot spot or energy hole that are formed near sink node are also addressed. Various new emerging strategies laid stress on the best optimal usage of constrain resources like energy, memory and various other processing abilities. This paper addresses a review of different research works done in this area.**

Index Topics- **WSN, Data gathering, Cluster heads, Sensor Nodes, Clustering Protocols**

I. INTRODUCTION

Wireless Sensor Networks (WSN*)* has globally attained focus in few years. Its an**—Insitu**technology based on sensors which are small, independent and compressed elements known as sensor nodes or motes settled in distant region to sense occurrence, gather and process data and send recognized material to operators**.**WSN have remarkable application in almost all areas of military services, location nursing, business, medicinal purposes and smart shipping schemes. Various researchers have an entrenched their work for conserving resources and employing proficiently communication competencies because of existing features of sensor node like inadequate power supply, conserving and computational, particularly on conserving energy utilizationfor extending lifespan of network.Among all,data gathering protocols on energy efficacy is on top. WSN employing clustering conserves power by decreasing nodes communication link number to the base post.In most WSN applications currently the whole network where pure human access and observing cannot be simply programmed or proficiently achieved or it's even not possible at all;these networks have the capability to work unattended. They create a network in an ad hoc mode in the regions of quite unrestrained means (e.g. dropped by a helicopter) based on the acute expectation by arbitrarily deploying the sensor nodes.Great populaces of sensors are estimated for short interval of the battery vitality of the sensors and the likelihood of having impaired nodes during distribution, in view of the wholeregion to be enclosed; participation of numerous sensor nodes is expected to be employed. Other than this, sensors are energy guarded and their batteries cannot be frequentlyre-energized in such situation.In addition to reserve network lifespan reasonably high in such situation, specified energy conscious routing protocols and data gathering protocols with high scalability areuseful.To fulfill the above scalability objective and mostlyattain high energy effectiveness and extend network lifespan in large-scale WSN locations combination of sensor nodes into clusters have been broadly embraced by research community. Implementation of cluster based associationof sensor nodes so that data fusion and aggregation are likely with the corresponding hierarchical routing and data gathering that leads to major energy savings.In the hierarchical network structure, every cluster has a head called as Cluster head(CH) for executing the different jobs such as fusion and aggregation and various mutual sensor nodes (SN) as members. The higher level is made of CH nodes and the lower layer with cluster memberwhoform a two-level hierarchy in cluster formation. The sensor nodes transmit data to the analogous CH nodes periodically. The CH nodes reduce the overall number of transmitted packets by gathering the data and sending them to the base station(BS) unswervingly or through the midwaymessaging with other CH nodes.Energy is obviously exhausted at higher rates, as the CH nodes send data all the while to greater distance than common member nodes. Time to time re-electing new CHs in every cluster is a mutual resolution for harmonizing the energy ingestion amid all the network nodes.

II. CLUSTERING PARAMETER

Number of clusters (cluster count): The creation process and CH selection leads to different number of clusters. In the

view of effectiveness of overall routing protocol, it is always a crucial parameter.

Intra cluster communication: Earlier it was found in some clustering methodologies that communication between sensor and the aforementionedassigned CH was supposed to be direct (one-hop).Later, intra communication multi-hop is required, i.e., the sensor nodes communication range is bounded or their number is enormous and the number of CH is confined.

Nodes and CH mobility: Assuming the CHs or the nodes to be mobile, there is dynamic variation for the cluster membership for every node, compelling clusters to advance withspell and most probably monitored continuously.

Nodes types and roles: When the CHs are supposed to be furnished with considerably additional computation and communication assets than others ,they lead to heterogeneous environments but when they have the matchingabilities and a subset of the arranged sensors labeled as CHs they lead to homogeneous environments.

Overlapping: For improved routing effectiveness or for rapid cluster formation protocol execution or for some other motives , numerous protocols give great significance to the notion of node overlapping within different clusters while many of the well-known protocols, still try to have minimum overlap only or do not support overlapping at all.

III. RELATED WORK

Lingyun Yuan, Xingchao Wang, JianhouGan [1] proposed a new data gathering algorithm grounded on mobile agent and event-driven is obtained for cluster-based wireless sensor networkfor increasing energy effectiveness and decreasing network delay applied to nascent event observing in wireless sensor networks. In this paper,the remaining energy, the stimulated intensity and the path loss determines the next step in route planning for mobile agents.By crossingevery member nodethe mobile agents can collect information.Mobile-agent-based model has enhanced progress in energy utilization and network delay compared to C/S model as per various theorystudies and simulation results. In addition, mobile agents show better compatibility for wireless sensor networks than C/S model in data aggregation. Moreover, DGMA too offer better performance to a large scale nascent event observing for wireless sensor network.

R.Rajeshwari1, Mr. B. Prakash[2] presented "groups of sensor nodes called as sensor networkssend sensed data to base station in cooperation with one another". An efficient use of battery is important for increased network lifetime, therefore, reduction of data traffic inside sensor networks and reduction of data that needs to be communicated to the base station is essential because of their battery powered characteristic.In cluster-based approach, whole network is distributed into numerous clusters**.**A cluster head for every cluster is elected among cluster members.The character of aggregator is done by cluster head which combines received data in the neighborhood from cluster members.The proposed arrangement is thought to be an effective data compression technology that has capability of compressing the bulk of the conveyed data or promoted towards mobile sink.

Babar Nazir, HalabiHasbullah[3] presented hotspot problem and purposed Mobile Sink based Routing Protocol (MSRP) for extending Network Lifespan in Clustered Wireless Sensor Network is addressed. Rigorousmodel is carried out using OMNet-4.0 to estimate the progress of the suggested scheme.Metrics like energy per packet and throughput are used for comparing the result of the said strategy to the static sink and multiple sink strategies. In terms of energy per packet and throughput, the simulation results prove that mobile sink strategy outshines both static sink and multiple sink strategies. It implies that mobile sink in clustered WSN increases performance. Hereafter, MSRP is efficient in enhancing the network lifespan and also inimproving throughput than static sink and multiple sink strategies.

LannySitanayahet al. [4] proposedER-MAC,a hybrid MAC protocol for emergency response wireless sensor networks. A hybrid design of the TDMA and CSMA approaches is ER-MAC. To schedule collision-free slots, it implements a TDMA approach. Nodes sleep to preserve energy but wakes up only for their assigned slots. For any emergency, the participating nodes alter their MAC behavior by letting contention in TDMA slots. Simulations in ns-2 demonstrate that ER-MAC outstrips Z-MAC with greater delivery ratio, lower energy consumption andminor latency.**Guoliang Xing, Member, IEEE, TianWang, Student Member, IEEE, ZhihuiXie, andWeijiaJia** [5] proposed the rendezvous-based method for employing MEs to gather sensor data under temporal restraints is discussed. Two rendezvous planning algorithms, RP-CP and RP-UG, are established for the situations where MEs' paths are reserved on the data routing tree and MEs' paths are not reserved, respectively. In this paperRDC protocol has been designed that facilitates unfailing data transfers from the network to MEs. The simulations indicate that this approach significantly reduces network energy utilization and scale well with network density, ME speed, and the various different deadlines. Moreover, RDC is vital to significant variance of ME speed.**Chaurasiya, Sandip K, Jaydeep Sen, Shrirupa Chaterjee, and Sipra D. Bit** [6] presented a clustering scheme in WSN is proposed where selection of cluster heads are established on relative involvement of the nodes towards keeping the network alive by balancing energy utilization for a prolongedepoch of time. The impact is calculated not only on the remaining energy of the nodes but also comparative positions in the cluster are also considered. Network lifespan is the means of measurement for the scheme performance. Comprehensive simulation is done by varying diverse parameters that effect network lifespan impressively. Equating the results with an existing clustering scheme in every case indicates that the current arrangement outstrips the existing one.

Zhao, Huan, Songtao Guo, Xiaojian Wang, and Fei Wang [7] studied persisting network lifespan problem in large scale wireless sensor networks in which a mobile sink collects data from time to time along the predeterminedroute and every sensor node broadcast its data to the mobile sink over a multi-hop communication path.We suggest a heuristic topology control algorithm with time complexity O(n(m + n log n)), where n and m are the number of nodes and edges in the network, respectively, based on greedy policy and dynamic programming additionally conferred the enhancement of our algorithm to fulfill practical necessities such astransmission timeliness and distributed computing.In accordance to the theoretical study and experimental outcomes our algorithm shows better outcomes than the earlier existing algorithms.

Krishnan, A. Muthu, and P. Ganesh Kumar [8]proposed data gathering algorithm built on the clustering architecture aided with TDMA time slot assists to attainacompetent data gathering method.Moreover,data traffic is concentratedwithin the clusters due to data aggregation on the nodes. Number of data packets received, network lifespan and residual energy estimate the productivity of the suggested model. The proposed algorithm attains low energy utilization compared to other algorithm and results in better network lifespan. Solution for network researchers and motivation to work in a new direction are the central motive of our work.

Jose, Deepa V., and G. Sadashivappa [9] introduced two famous bio inspired optimization practices- ABC and PSO.A comparison of ABC algorithm is made with the newly suggested strategy with sink mobility and the simulation outcomedemonstrates the effectiveness of the suggested one in terms of average packet delay and the lifespan. It is obligatory for a WSN to lessen delay in packet delivery and the mean energy should be high as well.These standards are fulfilled in the suggested algorithm. So this approach find its way in the area where time delays acts as vital role i.e., for real time applications.

Prof. N R Wankhade1, Dr. D N Choudhari[10] have proposed a new unequal clustering routing protocol for WSN. Hot spot emerges out as a problem while implementing multi hop routing in clustered sensor networks. For this, unequal clustering algorithm is proposed.CH that is near to the base spot are tiny clusters in dimension and vice versa. Thus for inter-cluster data progressing they could conserve power.Introducing aggregated unequal layer inter clustering also aids in.

IV. CONCLUSION

In this paper we presented an avant-grade survey on different clustering approaches with equal or unequal size of clusters. In this paper some clustering approaches are classified. This survey shows that unequal clustering approaches are better than equal clustering approaches to increase the lifetime of the network and to avoid the hot spot problem.

V. REFERENCES

[1]. Yuan, Lingyun, Xingchao Wang, JianhouGan, and Yanfang Zhao. "A data gathering algorithm based on mobile agent and emergent event-driven in cluster-based WSN." *Journal of Networks* 5, no. 10 (2010): 1160-1168.

[2]. Rajeshwari, R., and Mr B. Prakash ME. "Towards Energy Efficient Cluster Based Approach In Wireless Sensor Networks Using Mobile Sink."

[3]. [Nazir, Babar, and HalabiHasbullah. "Mobile sink based routing protocol (MSRP) for prolonging network lifetime in clustered wireless sensor network." In *Computer Applications and Industrial Electronics (ICCAIE), 2010 International Conference on*, pp. 624-629. IEEE, 2010.

[4]. Sitanayah, Lanny, Cormac J. Sreenan, and Kenneth N. Brown. "ER-MAC: A hybrid MAC protocol for emergency response wireless sensor networks." In*Sensor Technologies and Applications (SENSORCOMM), 2010 Fourth International Conference on*, pp. 244-249. IEEE, 2010.

[5]. Xing, Guoliang, Tian Wang, Zhihui Xie, and Weijia Jia. "Rendezvous planning in wireless sensor networks with mobile elements." *Mobile Computing, IEEE Transactions on* 7, no. 12 (2008): 1430-1443.

[6]. Chaurasiya, Sandip K., Jaydeep Sen, Shrirupa Chaterjee, and Sipra D. Bit. "An energy-balanced lifetime enhancing clustering for WSN (EBLEC)."In*Advanced Communication Technology (ICACT), 2012 14th International Conference on*, pp. 189-194. IEEE, 2012.

[7]. Zhao, Huan, Songtao Guo, Xiaojian Wang, and Fei Wang. "Energy-efficient Topology Control Algorithm for Maximizing Network Lifetime in Wireless Sensor Networks with Mobile Sink." *Applied Soft Computing* (2015).

[8]. Krishnan, A. Muthu, and P. Ganesh Kumar. "An Effective Clustering Approach with Data Aggregation Using Multiple Mobile Sinks for Heterogeneous WSN." *Wireless Personal Communications* (2015): 1-12.

[9]. Jose, Deepa V., and G. Sadashivappa. "A novel scheme for energy enhancement in wireless sensor networks." In *Computation of Power, Energy Information and Commuincation (ICCPEIC), 2015 International Conference on*, pp. 0104-0109. IEEE, 2015.

[10]. Prof. N R Wankhade, Dr. D N Choudhari. " Energy efficient unequal clustering algorithm for clustered wireless sensor network" *International Journal of Technical Research and Applications*
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