

Review and Proposed Work for MODI-LEACH for Improvement of LEACH for Energy Consumption in Wireless Sensor Networks

Shekhar Vyas¹, Pinaki A. Ghosh²

¹Comp. Engg. Dept. , Atmiya Insti. Of Tech. & Sci., Rajkot, India. , shekharkvyas@gmail.com

²H.O.D. of Comp. Engg. Dept. , Atmiya Insti. Of Tech. & Sci., Rajkot, India. , pinaki@pinaki.in

Abstract-Leach is a wireless sensor network routing protocol. Leach protocol work on cluster formation of wireless sensor network. It consists of two phases of leach protocol. In first setup phase of leach protocol it choose appropriate node for becoming cluster head of particular cluster. In second phase of leach protocol member nodes of cluster send data to cluster head of that particular cluster. Then cluster head by applying appropriate aggregation function send all data to base station. So that this uses significant energy to do this work. So that as time pass energy of member nodes are tends to zero. So that as time pass wireless sensor network not able work and send data to base station efficiently. So that appropriate working of wireless sensor network it is necessary that energy conception is significantly reduce. So that this proposed protocol MODI-LEACH deal with energy consumption in wireless sensor network. So that as energy conception is reduce wireless sensor network can work for long time so that overall lifetime of particular wireless sensor network is increase. So that proposed protocol MODI-LEACH use first the concept of eliminate redundancy so that redundant data is eliminated. Second it will also use choose efficient cluster head concept so that energy conception is reduce. So that this paper consists of proposed work for MODI-LEACH protocol.

Keywords-Leach, Wireless Sensor Networks, Energy Conception, Cluster, Cluster Head

I. INTRODUCTION

This paper deals with wireless sensor networks. Main motivation and introduction is for this paper is get from [1]-[10]. For simulation motivation get from [6]. It uses system and energy model given from [6]-[10]. Main base paper is [1], [2]. This wireless sensor network consists of small and low energy sensor nodes. This sensor node are geographically disperse in area which we want sense or measure parameters. There are mostly member node and base station. So that member node send periodically data to base station. This member node sends data like parameter or other information according to its geographical area.

Then there is periodically energy of a member sensor nodes is start decreasing as they are sending data to the base station. According to this after number of transmission to base station this member sensor node energy is decreased and it don't have energy than it is not able to work for wireless sensor network. As time goes all node one by one energy is decreases and not able to work for wireless sensor network for sending parameter or other information to base station. This is node not able to work for wireless sensor networks is called node of a particular wireless sensor network is dead and not do further work by it.

This is for how much time node of a wireless sensor network stay alive and send data to the base station is called the lifetime of the particular wireless sensor network. So that our usual day to day algorithm cannot directly applied to the member nodes of wireless sensor network. In wireless sensor networks architecture is clustered architecture in this there is member sensor nodes are organized in a cluster. Cluster mainly consists of a member node and cluster head in particular one cluster there are many cluster in that particular wireless sensor network. There are not all node send data to base station but there is only cluster head of particular cluster send data to base station.

In this cluster head collect data form all of member node of particular cluster than apply some aggregation function and send data to base station. Leach is routing protocol for clustered architecture in wireless sensor networks. It deal with collecting data from node of cluster and send to cluster head of that cluster. After that cluster node send data to sink node. In this cluster forming each rounds dynamically and cluster heads are selecting in each rounds. It works in two phases setup phase and steady-state phase both are perform one by one until the network lifetime.

In first in setup phase there is cluster are forming in wireless sensor network using in setup phase. Then there is selection of a particular node of a cluster is done which is act as cluster head of particular cluster. This forming is cluster and selecting a cluster head is a dynamic process because it done each round of leach

protocol. So that all the time not only one node become a cluster head but different nodes are become cluster head.

So that by this dynamic nature of leach protocol energy consumption is reduced and lifetime of wireless sensor network is increases. After that there is a steady-state phase in this all member of cluster send data to particular cluster head of particular cluster. Then cluster head done data aggregation function and send data to base station and again setup phase is begin and so on. As energy is consume network lifetime is reduce so efficient working it is important that energy consumption is significantly reduce. That is proposed in this paper.

So that in this MODI-LEACH is use the two different concept for reducing energy consumption in wireless sensor network. In the first concept it uses the concept of eliminate redundancy so that all member nodes not send redundant data to cluster head so that energy conception of all over wireless sensor network is reduce [1]. It will also use choose efficient cluster head concept so that less energy node does not become the cluster head of a particular cluster so that energy conception is reduce [2]. So that this two main concept eliminate redundancy and best path concept uses in MODI-LEACH protocol and proposed in this particular paper.

II. LITERATURE REVIEW

2.1. Energy Optimization based on the Redundancy in WSNs [1]

In wireless sensor networks there is some degrees of redundancy to achieve robustness of the network. If it is not handle in proper way than it leads to redundant transmission and reception operation. So that in this paper propose MR-LEACH (Measurement Redundancy aware LEACH) in which only single node transmit the data of redundant group. Simulation result shows that it outperforms the original LEACH protocol in terms of network lifetime and end-to-end delay.

It increases the lifetime of wireless sensor network. It reduces the end-to-end delay between nodes of wireless sensor networks [1]. It reduces the Average energy consumption of each cluster head in each round.

It does not considering event triggering in wireless sensor network [1]. In this initial wireless sensor network deployment does not include explicit redundancy specification.

2.2. An Improved Routing Algorithm Based on LEACH for Wireless Sensor Networks [2]

LEACH have some disadvantage like direct communication between all cluster heads and sink node, which brings high energy consumption. So that in this paper Improved LEACH known as ILEACH. It employed first consider residual energy of a cluster nodes, second new energy function is proposed for balance the energy consumption among cluster heads, third data aggregation tree is constructed to transmit the data from the cluster heads to sink node. Simulation results show that the proposed algorithm provides higher performance and longer network lifetime, compared with LEACH.

It is use the residual energy to form clustering, which can avoid the low energy node becoming a cluster head [2]. In this an energy function is proposed to balance the energy consumption among cluster heads. This ILEACH algorithm provides higher performance and longer network lifetime.

In this more parameter added to energy function so it takes more time and energy to calculate it. In data transmit through aggregation tree so that more delay get to transmit data to sink node.

2.3. ANCH-A New Clustering Algorithm for Wireless Sensor Networks [3]

Now a day's wireless sensor network is widely used due to its advantages. In that clustering is a widely used scheme for the organizing node in network. For that in this paper propose A New Clustering Algorithm for choosing CH in each round of WSNs. Simulation shows that it significantly decrease energy consumption and prolonging network life time.

It considerable reduction in energy conception. It prolonging the lifetime of wireless sensor network. It finds appropriate cluster head in each round so that it forms optimal cluster at each round [3].

It does not take dynamic values for closeness of cluster head nodes. It does not add-on threshold to selection of cluster head nodes [3].

2.4. ACH- Away Cluster Heads Scheme for Energy Efficient Clustering Protocols in WSNs [4]

In wireless sensor network conventional protocol like leach is not an optimal protocol. So that in this paper propose a scheme called Away Cluster Head (ACH) which effectively increases the efficiency of conventional clustering based protocols. Simulation results show that LEACH-ACH, performs better than

LEACH in terms of stability period and number of packets sent to BS. The stability period of the existing protocols prolongs by implementing ACH on them.

It increases an efficiency in terms of a stability period of wireless sensor network. It increases an efficiency in terms of number of packet send from cluster head to base station. CH take part in the selection of next CH thus the number of CHs reduced and the CHs made distant [4].

For become cluster head node wastage significant energy for sending SNR signal to all other node [4]. If node gets higher SNR signal that it cannot become cluster head so that energy for sending SNR signal is wastage.

2.5. An Energy-efficient Clustering Algorithm for Wireless Sensor Networks [5]

This paper contain energy efficient clustering algorithm named as EECA for clustering nodes in a wireless sensor network efficiently. It works, for short, in two steps. First it efficiently choose cluster head for wireless sensor network based on nodes residual energy and distance between them. Second, the candidate cluster-heads compete to be the cluster-heads via a delayed broadcast mechanism. Simulations show that the proposed algorithm can prolong the network lifetime significantly.

It balances the distribution of cluster head so that it provides higher energy utilization [5]. It efficiently balances the energy consumption levels of nodes in wireless sensor network. It prolongs the network lifetime of a wireless sensor networks.

It does not use multi-hop communication in intra-cluster and inter-cluster communications for energy saving [5]. It used delayed broadcast mechanism so that time critical application it does not suitable.

III. PROPOSED WORK

Proposed work for conventional leach protocol is presented in this paper. In this modify leach protocol MODI-LEACH which will use the concept of eliminate redundancy and choose efficient cluster head concept.

Here in Figure 1 which describe topology of MODI-LEACH. In this there is MN (Member Node) in group send data to CH (Cluster Head) then CH sends data to BS (Base Station).

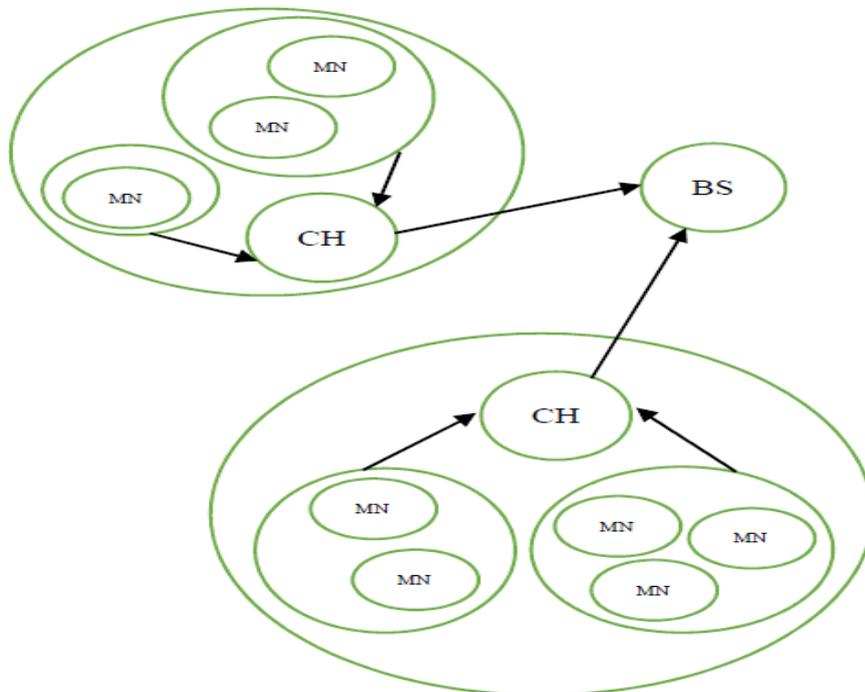


Figure 1. Proposed topology for MODI-LEACH

It will use eliminate redundancy using cluster formation so that only some node sending data to cluster head so energy conception is reduce [1]. In this it will first form the cluster as usual way like leach than after forming a particular cluster not all node send data to cluster head. So after identify redundancy not all node send

data to cluster head instead of that only some node only send data to cluster head. So that there is only few energy is conception is done in particular round so that network lifetime in increases.

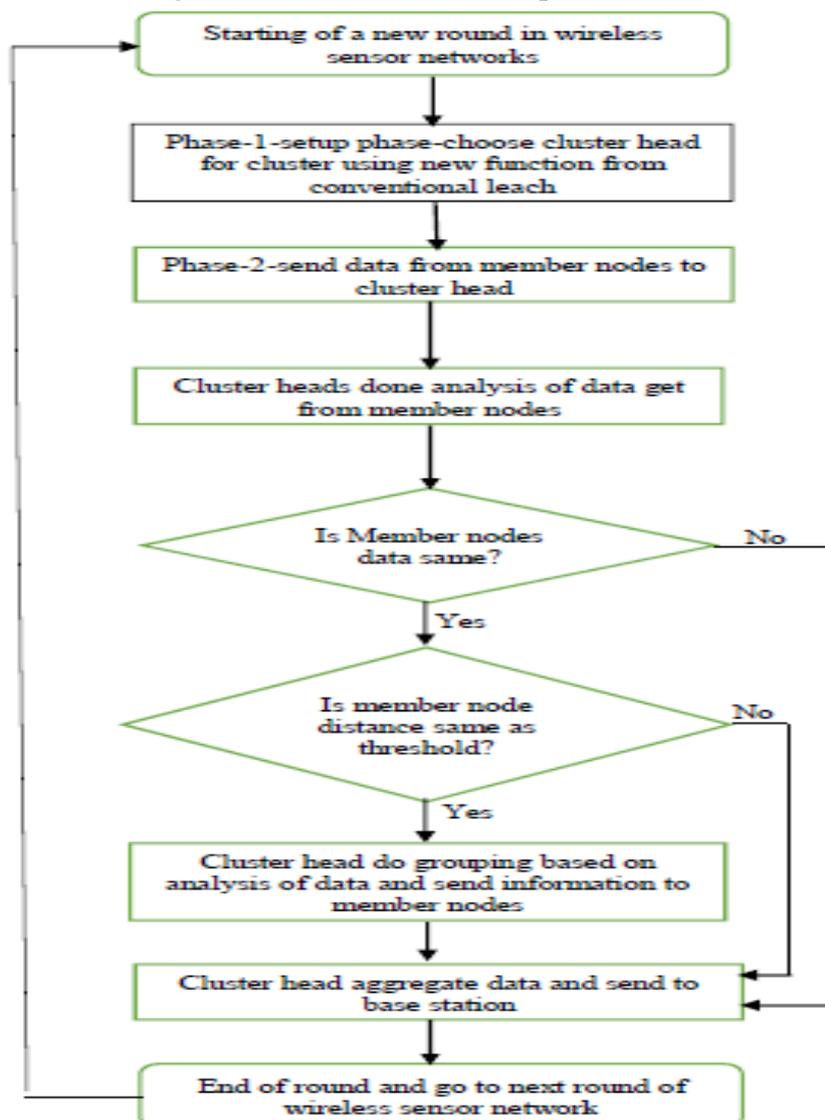
It will also use choose efficient cluster head concept so that energy conception is reduce. In this there is many node participate in election of choose cluster head for particular cluster. So there is node with high residual energy node always become cluster head instead of low residual energy node. So that high residual energy node become cluster head so that overall energy conception of network is reduces [2].

So that here proposed work for MODI-LEACH is that it will use the concept of eliminate redundancy and choose efficient cluster head concept. In this particular paper deal with energy conception of a node of a cluster and cluster head of cluster. It will mainly uses of advantages of eliminate redundancy [1] and choose efficient cluster head so that high residual energy node become cluster head [2].

It will use advantages of eliminate redundancy using to find node in a cluster sending identical data to the cluster head. So node having same data sending to cluster head than will not all node send data to cluster head but some node not all node send data to cluster head. So energy conception will reduces.

It will also use the concept of efficiently select particular cluster head for a cluster. So that there is only high residual energy nodes are become cluster head of particular cluster. So that there is first efficient cluster head selection will done based on new function. So node having high residual energy only become cluster head for particular cluster.

According to Figure 2 of flow chart there is first starting of a round done. After that there is phase-1 electing and choose cluster head of a particular cluster.



At this time there is instead of conventional LEACH protocol cluster head function there will be use the modified cluster head function so that higher residual energy node becomes cluster head of particular

cluster. After that there is phase-2 in which all member nodes of particular cluster send data to respective cluster head. After that cluster head will do analysis of data get from member nodes of particular cluster.

Then cluster head will check that data from member nodes are same or not? If yes then go to check for distance of member nodes, if no then go to aggregation function of cluster head to send data to base station. Then cluster head will check that distance from member nodes are same to threshold or not? If yes then go to send information to member nodes, if no then go to aggregation function of cluster head to send data to base station.

Then based on this analysis cluster head do the geographic grouping of member nodes. Then send member nodes information about on which time send data to cluster head. Then cluster head aggregate data get from member nodes and send it to base station. After that go to next round in wireless sensor networks.

Then cluster head aggregate data get from member nodes and send it to base station. After that go to next round in wireless sensor networks. Here implementation of MODI-LEACH will be done on ns2 simulator [6]. So that by using eliminate redundancy and choose efficient cluster head concept it will reduce overall energy consumption of wireless sensor network.

IV. CONCLUSION

This paper proposed protocol MODI-LEACH. This uses first concept eliminate redundancy. Second concept is use choose efficient cluster head concept so that only higher residual energy node become cluster head. Proposed work for this MODI-LEACH in this paper describe that this MODI-LEACH protocol significantly energy consumption is reduces and also overall lifetime of wireless sensor protocol is increases significantly. Future work for this paper is implementation of this particular MODI-LEACH protocol.

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