

# EXTEND THE NETWORK LIFETIME- USING PDORP ROUTING PROTOCOL FOR WSN

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## ABSTRACT

To estimate behind this work, to propose a PEGASIS–DSR optimization routing protocol based on measured in energy efficiency of wireless sensor networks in a real environment. PDROP has the characteristics of both power efficient gathering sensor information system and DSR routing protocol to identify energy efficient optimal paths. The performance analysis and comparison through a hybridization approach of proposed routing protocol gives better results add up to less bit error rate, less delay, less energy consumption, and better throughput, which leads to better QoS and extend the network lifetime. The computation model is adopted to evaluate and compare the performance of the both routing protocol using soft computing techniques. The results have been derived from NS-2 simulator and show that the proposed protocol performs better than the other routing protocol in terms of better stability, better throughput, and energy efficiency.

**Keywords:** Sensor Networks, Pdrop, Energy Efficient, Dsr, Pegasus

## I. INTRODUCTION

In recent times [1] wireless sensor networks enhancing an essential part of many application environments that are used in Military and civilians. The key applications of wireless sensor network are habitat monitoring, target tracking, surveillance, and security management. The application of wireless sensor networks consists of small sensor nodes that are low cost, low power and multi functional. The sensor nodes are densely deployed in a malicious environment to monitor, detect, and analyze the physical phenomenon and dissipate substantial quantity of energy while transmitting the information [2]. It is impossible and sometimes impractical to substitute the battery and to sustain extend network lifetime so there is a limitation on a lifetime of battery power and energy conservation is a challenging issue. The main source of the wireless sensor networks lifetime is battery, communicating with the different hubs or sensing motion expends a great amount of energy in preparing the information and transmitting to the sink. It is annoying to undermine the batteries that are draining of energy.

There are different interpretations of energy efficiency [3], including 1) minimum efficiency consumed per packet 2) maximum time to network partition 3) minimum variance in node power levels 4) maximum energy capacity. The routing protocol can be mainly depends upon the energy consumed while travelling from source to destination. Densely deployed nodes endure from many failures due to drained battery power, environmental

conditions. There are number of routing protocol are used in the wireless sensor networks to reduce the energy consumption and extended network lifetime as following ,PEGASIS, DSR, LEACH etc.

## II. LITERATURE SURVEY

Wireless sensor networks routing can be differs from the traditional routing in fixed networks in various ways. The routing protocol having no infrastructure, unreliable wireless links, sensor nodes can failed in the wireless sensor networks, the routing protocols have to meet the strict energy saving requirements.

### 2.1 Dynamic Source Routing Protocol (DSR)

The dynamic source routing (DSR) is a reactive routing protocol [4]. Each data packet can be contains complete routing information of reach the destination. Its can send the packet in shortest path of routing. The DSR protocol is composed of two mechanisms 1) route discovery (Fig 1) 2) maintenance of source routes (Fig 2) in the wireless sensor networks. Route discovery is the mechanism a node S desiring to send a packet to a destination node D. Maintenance is the second mechanism of DSR. In which s is able to detect while using a source route s to destination routed.

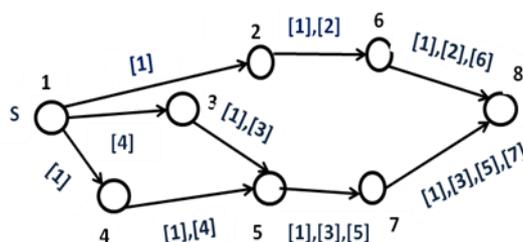


Fig 1: Route Discovery

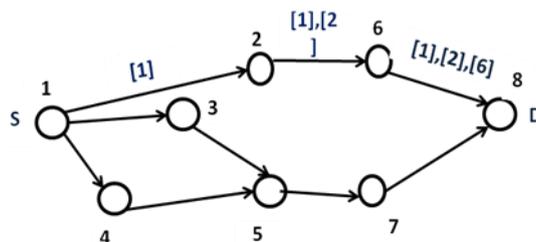


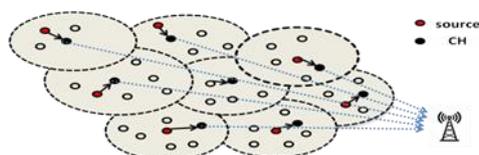
Fig 2: Route Maintenance

Dynamic source routing protocol is more suitable in terms of small energy density. [5] But sometimes when the mode of a node changes from active to sleep the efficiency decreases as the data packets need to wait at the original point, where the packet has been sent and this increases the waiting time and end-to-end delay of the packets, which leads to increase in energy consumption. The problem of consider in dynamic source routing protocol to identify the dead nodes and to choose another suitable path.

### 2.2 Low Energy Adaptive Clustering Hierarchy (LEACH)

LEACH is a cluster based protocol [4], it is randomly select a few sensor nodes as cluster heads (CHs) and rotate this role to evenly disseminate the energy load with the sensors in the network. The cluster head(CH) [Fig 3]nodes compress data arriving from nodes that belong to the respective cluster, and send an aggregated

packet to the base station in order to reduce the amount of information that must be transmitted to the base station. LEACH used a TDMA/CDMA MAC to reduce inter-cluster and intra cluster collisions.

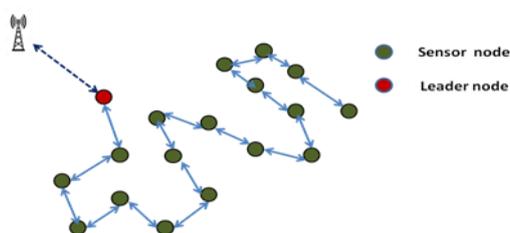


**Fig:3 Cluster based in Protocol of LEACH**

This protocol operates in two phases.[6] These are set up phase and steady state phase. In setup phase, nodes form the cluster and actual data is transmitted in the steady state phase. Each node chooses a random number between 0 and 1 to become the CH. But sometimes problem can be occurred in the LEACH, 1)rotate in the role of CHs 2)election based CHs. This type of problem can be decreases the energy at the every sensor nodes.

### **2.3 Power Efficient Gathering On Sensor Information System (PEGASIS):**

In an improvement over the LEACH protocol [6] is also called power efficient gathering in sensor information systems (PEGASIS), it is a near optimal chain based protocol. PEGASIS avoids cluster formation and uses only one in a chain to transmit to the base station (BS) [Fig 4] instead of using multiple nodes. The essential objective of the protocol, in order to extend the network lifetime, nodes are need to communicate with their closest neighbours and they take turns in communicating with the base station. In PEGASIS routing protocol[7], all the sensor have global knowledge about the network and use a greedy approaches .if the sensor nodes can be failed or dies due to the low power, chain is constructed using the greedy approach by passing the failed sensor. PEGASIS can be reduces the power required to transmits the data per round and power draining is uniformly.



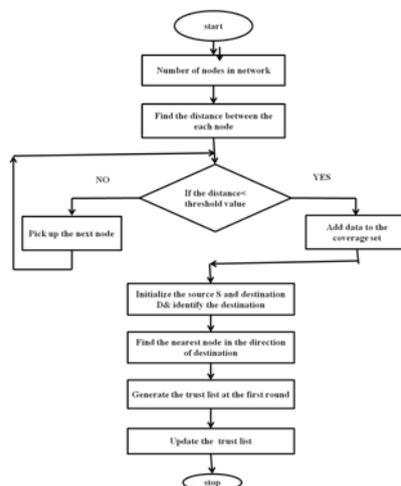
**Fig:4 Chain based Protocol of PEGASIS**

PEGASIS achieves high energy efficiency since each node only communicates with its closest neighbours. The transmission power can be lowest required to reach its neighbours in the chain format. A disadvantages of PEGASIS having the significant delays.

## **III. PROPOSED SYSTEM**

PDORP is the expansion of PEGASIS-DSR optimized routing protocol. PDORP protocol [8] has the characteristics of both power efficient gathering sensor information system and DSR routing protocols. A PDROP routing protocol have stabilize constancy of the network by creating a trust list of transmitting the nodes. The proposed method appropriate the specialty of both proactive (PEGASIS) and reactive (DSR) routing protocol[Fig 5]. PDORP protocol is a directional transmission; stabilize on the edge decreases in communication distance among the nodes. In the proposed protocol generate a trust list for the first time in each

round, based on the parameters of the allocated nodes. To assumed limited number of sensor in the network, which are randomly arranged in 2-dimentional area. All the nodes have a initial energy  $e_i$ , where  $e_i > 0$ . Transmission can be occurred between two nodes. If the energy of nodes is lesser than or equal to the threshold value of the energy, transmission is not occurred.



**Fig:5 Flowchart of PDORP**

The proposed routing method is PDROP [8], by using algorithm 1) network creation, to create a network with randomly deployed nodes  $N$ . 2) path finding, A route for data transmission is established by using the path finding. This can be selected the optimal route in the large coverage set. If the source and destination in under the coverage set, then the transmission the data packets, otherwise repeat the path searching will be done. 3) Routing cache DSR integration, To checking of all nodes at the time of receiving a data packet, cause unessential delay. So the routing cache DSR integration algorithm having the solution of this problem. To establishing creates a trustiest for the first time in each round of allocated nodes. After the every round the trust list is updated. The trust list would not be checked in after a certain number of rounds so to avoid the unessential time delay. 4) Hybrid algorithm, to create the fitness value of trust, combined the generic algorithm and BFO approaches.

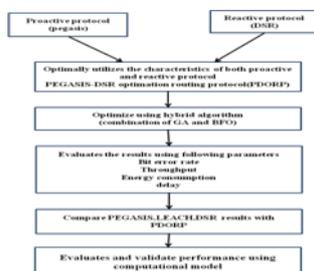
## IV. DISCUSSION&RESULTS

There are number of parameters used in the wireless sensor networks, because extend the network lifetime is important. This simulation parameters are included in height and width of the network, routing cache, allocation of nodes [Fig 6] . The simulation results can be obtained in a creation of number of deployed nodes in randomly[Fig 8] and route can be discovery in shortest path algorithm and maintaining the route in network [Fig 9]. The performance of different types of routing protocol

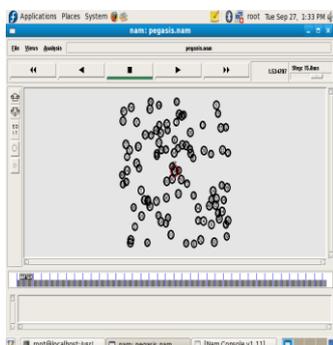
in wireless sensor networks such as PRP, DSR, LEACH,OD-PRRP.(Fig: 6 represents in the simulation model) . The below table gives the details about sample values taken for simulation

**Table 1: Sample Values for Simulation**

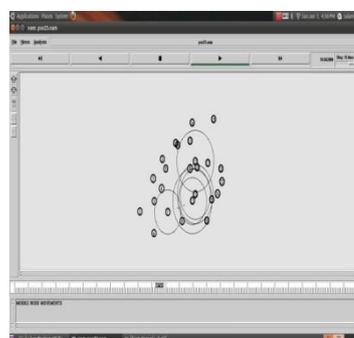
Parameters	Values
Width& Height	1000m
Type	GPS
Allocation	Randomly
Routing	PEGASIS
Caching	DSR



**Fig: 7 Estimation model of PDORP**



**Fig: 8 Simulation Of Network Creation**



**Fig: 9 Route Cache DSR Integration**

## V. CONCLUSION

In this paper, PDORP has a PEGASIS – DSR optimization routing protocol which having a proactive and reactive proting protocols using the concept of cache and directional transmission.the simulation results can be reduced the bit error rate, end to end transmission delay and increasing throughput without any of the energy efficiency.the result can be compared into the PEGASIS, LEACH, DSR,PRP, and OD-PRRP.

## REFERENCES

- [1] Wallanegus Dargie, Christian Poellabauer, “Fundamentals of wireless sensor networks” pp 7-17, 2010.
- [2] Jamal.NAI-Karaki,Ahmed E.Kamal, ”Routing Techniques in Wireless Sensor Networks”, pp 1-17,2011.

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- [3] Shio Kumar Singh, M P Singh and D K Singh “Routing Protocol in Wireless Sensor Networks-A Survey” vol.1,no.2,nov 2010.
- [4] RjabHajlaoui, SamiTouil, Wissem achour,”O-DSR: optimized DSR routing protocol for mobile ad-hoc networks” vol7, No 4, aug 2015.
- [5] Ravindra Prakash Gupta, Dr.Virendra Kumar Sharma, Vijay Mohan Shrimal,”Investigation of Different Parameter of Dynamic Source Routing with varied terrain areas and Pause Time for wireless sensor networks “vol 1, issue 2, pp626-631.
- [6] Meena Malik,Dr Yudhvir Singh,Anshu Arora,”Analysis of LEACH protocol in Wireless Sensor Networks” vol 3,issue 2, Feb 2013
- [7] Mathumathy,Dr.D Sivakumar,”A Comparative Analysis of Clustering Based Routing Techniques for Wireless Sensor Networks ”vol 3,issue 10, 2012.