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Effective Energy Path Based on PDORP Routing Protocol for WSN

Swapnali G. Latake[1], Prof S.V.Todkari[2]

P.G. Student, Department Computer Engineering, JSCOE, Hadapsar Pune, Maharashtra, India.[1]

Professor, Information technology JSCOE, Hadapsar Pune, Maharashtra, India[2]

ABSTRACT: Wireless sensor network is the network of interre-lated related network of sensor node in a wireless in nature instead wired system. As the main factor in wireless network is Energy consumption over network. Relevancy of network fully dependent on energy consumption of the network in case of packet transformation done in between the network and off course the QoS.The effect in the network for crating the critical overhead are different out of these some are Energy consumption, network lifetime, network scalability and one of the impact full parameter includes the Packet overhead. Packet overhead is the origin of more energy consumption and it ease the QoS in sensor networks. So WSN scientist came with one and more routing protocol those can play specific role to make WSN with good performance. One of the routing protocol is Dynamic Source Routing (DSR) but the problem with such protocol is that when we move toward the big energy bulk it doesn't make any sense as while communication need to have back and forth network transformation from active network to sleep and sleep to active for further network communication. In such case efficiency get decrease as the data packets needs to wait at the initial phase where the packet sent earlier and this increases the waiting time in short response time and end to end delay of the packets so by default energy consumption get increase. So important task here is to find either in way the new routing path anyhow, so that dead node should not be the part of further network and new route should be core route in the network. Ultimately the new routing path would be relevant in nature as energy consumption in the network get decrease. For managing such phases we propose directional transmission based energy responsive routing protocol named as PDORP. PDORP have quality characteristics to make the routing smoother. Power Efficient Gathering Sensor Information System (PEGASIS) and DSR routing protocols are the quality outcomes of PDORP. So for making the transformation more efficient in addition to above genetic algorithm and Bacterial Foraging Optimization (BFO) formally used for creating and reinitiating cluster based WSN in minimum price in optimize manner. For performance calculation we proposed the hybrid approach (soft computing techniques) for mentioned routing protocol and off course it will gives us better result comprising less bit error rate, less delay, less energy Consumption with Qos in WSN.

KEYWORDS: Wireless Sensor Network, Optimization Sys-tems, Energy Consumption DSR, PEGASIS, PDORP, OD-PRRP, LEACH.

I.INTRODUCTION

The wireless sensor network (WSN) typically consists of a Base node and a leaf node say tiny sensor node. So for doing communication in between lots of energy required to prepared communication link, to prepare the packet and transfer same to network [1]. So for such great communication need to have proper energy with good battery backup to each and every node in the WSN.As several cases, it is not secure ways to replace the batteries even though that is challenging or exhaustive for energy. Some scientists from this field trying to notice power-aware protocols for wireless sensor networks, keeping in mind the target goal to overcome such energy efficiency issues in such cases they introduces their own expectations based on primarysympathetic of WSN[2]. By setting common goal, scientist from different field identify and acknowledge the different design approaches [3-4]. To meet different design criteria, related researches into the optimization of WSN design can be grouped into several categories i.e. Optimization in the communication layers; Node hardware optimization and Cross-layer optimization. Most of the optimization procedures do not take into account the ideologies, characteristics and requirements of WSN which is application defined. Therefore, in proposed approach energy optimization is done using hybrid algorithms i.e. GA [3] and BFO [4] method in DSR protocol. WSN concert matrix fully dependent on node to node com-munication in between and data

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transmission [5-6].Densely deployed nodes suffer from many failures due to drained battery power, environmental conditions and addition of more. Self-motivated topology of WSN changes the position of the network node within the network. This features of WSN construct scalability, reliability, energy efficiency and resource management are great challenges in the design process of routing protocols. Energy consumption measure in two factor such as dynamic (mobile) and static say steady network.

II.REVIEW OF LITERATURE

Author Aarti Jain's paper based on technique Fuzzy logic and ACO based OD-PPRP routing she identify that Clustering is one of the widely used methods to save energy, increase reusability, and scalability and OD-PRRP has well network lifetime, less transmission delay, high packet delivery ratio and decrease in overhead than other routing protocols like, EEABR and EAODV [7].

Author Xin Guan Provides more uniform energy consumption in sensor nodes and also increase the lifetime of sensor networks .To reduce the energy consumption, Pinheiro et al. propose a model for minimization of power consumption in a heterogeneous cluster of computing nodes serving multiple web-applications, which periodically monitors the load of resources and makes decisions on switching nodes on/off to minimize the overall power consumption [8-9].

Author Akimitsu Kanzaki, Yasuhiro Nose introduce that we can construct effective communication routes in terms of both power consumption and the quality of communication. They proposed the method for finding or managing the route in WSN for communication and network formation in WSN [10]. Author Young's paper based on technique a cross-Layer Channel Access and Routing Protocol in that he introduces a new reliable protocol termed Cross-layer Channel Access and Routing (CCAR), which simultaneously supports both MAC and routing operations for medical-grade QoS provi-sions. It initially defines the routing path with the lowest traffic load and low latency using newly defined channel quality factors. Concurrently, the source node allocates the predefined QoS Access Category to each packet and reserves the channel by considering the route. CCAR introduces an effective route maintenance scheme to avoid link failures in bottlenecked intermediate nodes, which prevents unnecessary packet drops and route rediscovery evocations. Finally, through both simulation studies and real test-bed experiments, we evaluate the performance of CCAR by comparing it with other conventional protocols, demonstrating that the proposed pro-tocol can more efficiently support medical-grade QoS packets, especially when the network is heavily loaded [11].

III. SYSTEM ARCHITECTURE / SYSTEM OVERVIEW

We propose a scheme, named ENERGY EFFICIENT DI-RECTION BASED PDORP ROUTING PROTOCOL FOR WSN. We recommend directional transmission based energy responsive routing protocol named as PDORP. PDORP have some best characteristics to make the routing smoother are Power Efficient Gathering Sensor Information System (PE-GASIS) and DSR routing protocols. In addition to above routing protocol the genetic algorithm and Bacterial Foraging Optimization (BFO) properly used for generating and reinitiating the cluster based WSN in which it optimize the network while network formation. The performance analysis is calculated through the hybrid approach (soft computing techniques) of above routing protocol it will gives improved result containing less delay, less bit error rate, less energy Consumption and better quantity which signs to better QoS and extend the lifetime of the network. Steps of System Flow,

1. Network creation (WSN formation) algorithm.

2. Path finding algorithm.

3. Routing Cache DSR Integration (PDORP) algorithm.

4. Hybrid Algorithm (Action of GA and BFO) algorithm. The architecture diagram of the system shown below helps us to understand the system. Above architecture diagram shows

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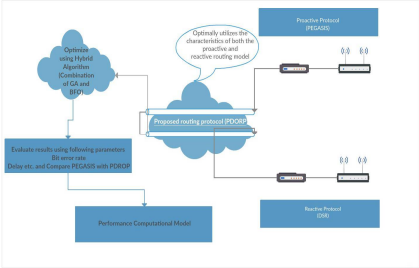

Figure 1. System Architecture

us the details simulation flow of the proposed system by going dawn in arrow direction mentioned in figure.

IV. SYSTEM ANALYSIS

In proposed system, the proactive routing and reactive routing methodology used in order to get fast and non-damaged path along with lower transmission delay in WSN. It will show through comparison simulation while making above type of WSN.

To make the network load balancing by seeing each node in the network. It form the network by considering the burden of each node in the network. LEACH used the adaptive cluster approach to maximize the energy efficiency. In our case PEGASIS will be utilized frequently [12-13]. To consume nodes efficiently and sensibly is one of the important features of sensor networks. As wireless sensor nodes are prepared with non- chargeable batteries with poor energy supply, a sensor network cannot work well after a portion of the nodes run out of energy. Another challenge in front of WSN is to receive the data from reliable nodes so that are fraudulent node cant interrupt the network traffic. The main contributions of this paper are as follows
It decrease the communication gap between the nodes so that less energy gets paid and it is ensured by using directional transmission.To achieve shortest path, less overhead, fast response and the connectivity of the nodes are achieved by using PEGASIS routing and DSR routing methodology.When a node becomes more aggressive at the time of transfer and previously it was not in the cache memory, the other node is bound to receive a packet from it and in such a way it can cause damage to existing routes. A solution to this problem could be checking of any node at the time of receiving a data packet but this would cause unessential delay. Hence, the proposed solution creates a trust for the first time in each round on the basis of the parameters allocated to the nodes. After every round, the trust list is updated and after a certain number of rounds, the trust would not be checked to avoid time delays. Initialize idle listening Sensing Processing Transmissiongiven data. Translations and content mining are permitted for academic research only.
For optimized WSN, Genetic Algorithm and BFO op-timization is applied to proposed routing protocol to identify energy efficient optimal paths.We can see the performance analysis of PDORP by comparing it with PEGASIS Routing Protocol (PRP).

V.MATHEMATICAL MODEL

Set Theory

A set is defined as a collection of discrete objects of same type on class of objects.
The object of a set are called elements or participants of the set. Object can be number,
Alphabet, names etc.

S = Our System

System “S” contains our whole system with his combination of various network components including Sink node and etc. On “S” analysis result should be display or say analyse.

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Sa = System Architecture
System architecture is the architecture of our proposed system with various components. It is the whole system in combination of all single module.
Sn = Sink Node
The sink node is a base station, is used to collect and process data in the centralized mode. Sink node bind all Cluster to one network.And communication between each cluster done through the sink node. Sink node is responsible for handling the message communication between the inside the network and outside the network. For Worldwide communication sink node is connected to the internet. In our proposed system sink node will be GA and BFO algorithm. And also evolution of all PEGASIS and DSR done with the help of same node and analysis result communicated through internet (I) to total system (Ts).

Ch = Cluster Head or base station

Cluster head is the parent node of all leaf node i.e. cluster member. Responsibility of Cluster head is bind all Cluster member with each other to make the network complete cluster. Cluster head are responsible for validating the transaction of message those are coming from all leaf node i.e. from Cluster member. Another responsibility of Cluster head is to communicate with other Cluster head in network. All Cluster head communicate with each other through Sink node in our system Cluster will be proposed system PDROP.

Cm = Cluster member

Cluster member is the leaf node of the network. All cluster member are connected to the cluster head of that network. Each cluster member send and receive the message through only cluster head. In proposed system cluster member will be PEGASIS and DSR.

I = Internet

Internet is medium through which information of our network get transfer or send to worldwide or to the secure place. In our proposed system through same module analysis result should display on proposed system UI.

Ts = Total System

Total system is the system of combination of our all network components such as Sink node, Cluster head and etc.

S = fSn, Ch, Cm,I g

In above case Our System is combination of Sn(Sink node),Ch(Cluster head),Cm(Cluster member) and I(Internet).

Ch = fCh1, Ch2, Ch3. . . . Chn — Chn-1 g

In above case Cluster head is combination of number of Ch. (Cluster head) up to Chn-1.We called it as Sensor Node.

Cm = fCm1, Cm2, Cm3. . . . Cmn — Cmn-1

In above case Cluster head is combination of number of Ch. (Cluster member) up to Cm-1. We called it as Sensor Node.

Sa = fSn U Ch U Cm U Ig

System architecture ultimately the union of Sink node plus cluster head plus cluster member plus Internet.

Ts = fS U Sag

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Finally our proposed system in mathematics we called it as Total system is the union of System and Generated proposed System architecture.

VI. ALGORITHM

Pseudo code of propose system is,

Input V= Set of all nodes

1. Get width, height and total node for network creation.
2. Create WSN using above parameter.
3. Create path for above node to deploy the network.
4. Find optimum node between source and destination
5. Find set all possible nodes of same network coverage between source and destination.
6. Use PDROP to find optimum node to add in WSN by considering the Vector list on WSN.
7. In case of message transformation check if node is empty or not
8. If node is empty then reject node else take node further for communication.
9. Apply GA and BPO for network optimization by considering the network efficiency in caseQOS.
10. After network established date transfer to sink node through the cluster node
11. Forward Data to Base Station or over Internet.

VII. ANALYSIS AND RESULT

Following Graph shows the difference between the existing system and proposed system and how the QoS is increased as compare to the existing system.

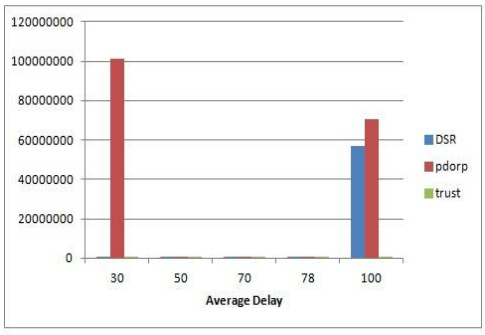
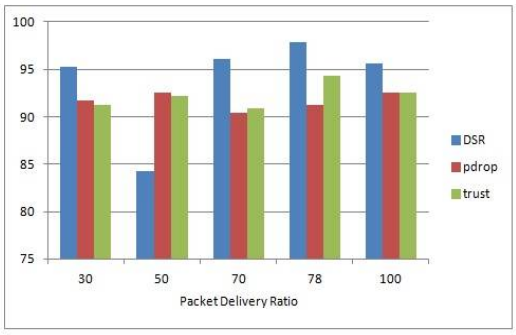


Fig.(a) Average Delay



Fig(b) Packet Delivery Ratio

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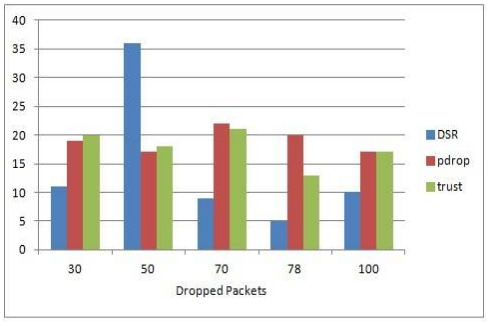
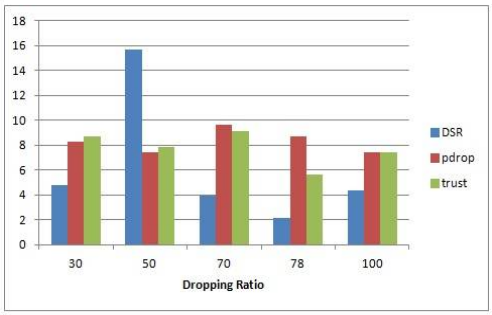
1.Average Delay : Fig(a) shows the average delay, in proposed system we minimize the average delay as compare to the existing system.

2. Packet Delivery Ratio : Fig(b) shows the packet delivery ratio , in proposed system the packet delivery ratio is increased as compare to the existing system.



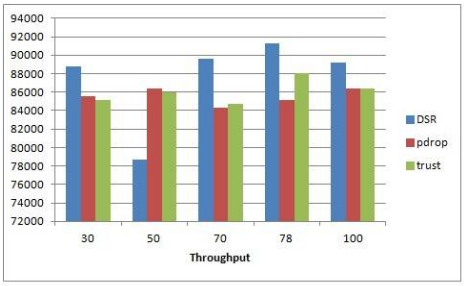
Fig(c) Dropped Packets



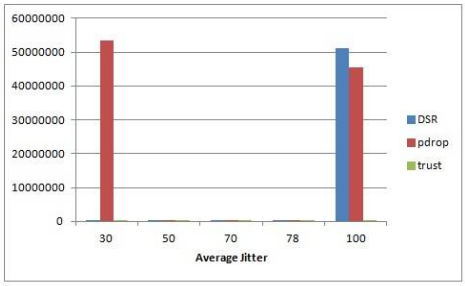
Fid(d) Dropping Ratio

3.Dropped Packets : Fig(c) Shows the dropped packets i.e. no of packets dropped at the destination. According to the no of nodes the no of dropped packets changes. In existing , dropped packets are minimum ,in proposed system no of dropped packets are increased.

4. Dropping Ratio : Fig(d) Shows the dropping ratio i.e. total no of packets transfer and out of that how many packets are reached /delivered at the destination. According to the no of nodes the no of dropping ratio will changes. In existing,dropping ratio are minimum ,in proposed system dropping ratio is increased.

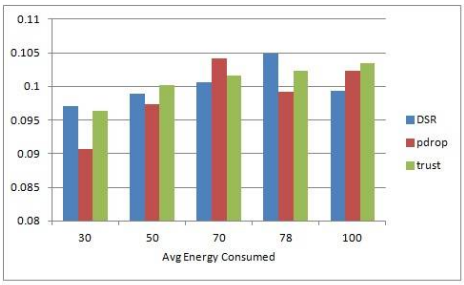


Fig(e) Throughput



Fig(f) Average Jitter

5.Throughput : Fig (e) shows the Throughput,It is one of the QoS over the WSN.In data transmission, network throughput is the amount of packets transferred successfully from source to destination in a given time period, and typically measured in bits per second (bps), as in megabits per second (Mbps) or gigabits per second (Gbps)



Fig(g) Average Energy Consumed.

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6. Average Jitter: Fig(f) shows the Average jitter.It is is defined as a variation in the delay of received packets. The sending side transmits packets in a continuous stream and spaces them evenly apart. Because ofnetwork congestion, improper queuing, or configuration errors, the delay between packets can vary instead of remaining constant.In proposed system jitter is minimized.

7.Average Energy Consumed : Fig(g)shows the Average Energy Consumed during the transmission of the packets. In existing system there is large amount of energy consumption is there . In proposed system there is minimization of energy consumption and increase the QoS.

Fig(a) Average Delay,Fig(b) Packet Delivery Ratio,Fig(c) Dropped Packets,Fig(d)Dropping Ratio,Fig(e) Throughput Fig(f) Average Jitter Fig(g) Average Energy Consumed

All Graphs shows the difference between the existing system QoS and proposed system QoS. In Proposed System we try to maintain and increse the Quality of services.

IX. CONCLUSION

We offered hybrid optimization based PEGASIS-DSR op-timized routing protocol (PDORP). It includes cache and directional transmission concept for the proactive routing protocols and reactive routing protocols. The simulation re-sults of our proposed system show reduction in end to end transmission delay and bit error rate without compromising with energy efficiency. In PDORP, using the proactive routing methodology and the reactive routing methodology we getnon damaged and long lasting trusted path along with trivial transmission delay. The performance simulation of PDORP can evaluated by comparing with existing technique.

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