Secure Routing Method in Wireless Sensor Networks Based PSO

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Abstract

The need for efficient optimization of network resources to cover the lifetime of large-scale and dense deployments of Wireless Sensor Networks opened the door for researchers to study and produce efficient clustering techniques. Clustering has proven an effective approach for organizing a large scale WSN into connected groups increasing the lifetime and the reliability of such networks. Distance of the nodes from the base station and inter-node distances can have a high influence on saving energy and extending the network lifetime. In this process, a PSO based data transmission in WSN is proposed. PSO algorithm to optimize clustering process by considering the energy, velocity, speech of each node. This feature will have a great effect in prolonging the network lifetime as it reduces the amount of energy wasted on replacing the node.

Keywords: lightweight, efficient, q-learning, trust, wireless sensor networks.

I. INTRODUCTION

WSNs are characterized with various levels of device node arrangement, high responsibility of device nodes, more power, computation, and memory constraints. Thus the major characteristics and constraints limit the application of WSNs.The device nodes run on non-rechargeable batteries. The routing through the network seeks to be energy economical with the utilization of the resources and thence this is often a very important factor to be analyzed. In wireless technologies, some of the advances and evolutions lead to the introduction of low power wireless device networks.

With the availability of multiple functions and uncomplicated arrangement, the device nodes are often employed in numerous applications like target trailing, atmosphere observation, and health care, fire detection, controlling internal mode, power management, crime investigation and intelligence Activity (2008). The most responsibility of the device nodes in an exceedingly network is to forward the collected data to the sink for certain operations.

However the resource limitations (2012), unreliable links between the device nodes together with the varied application demands a tough task to style Artificial Network (AN) economical routing formula in WSN.

There are many appropriate routing algorithms are available for various applications, fulfilling the various performance demands has been thought about as a very important issue in WSN. Hence several routing algorithms are planned to enhance the performance demands of varied applications through the network layer of the WSN protocol stack (2004, 2005), however most of them are supported single-path routing. In single-path routing approach node selects one path that satisfies the performance demands for transmission of the load towards the sink.

Though the only path between the supply and sink are often developed with minimum computation quality and resource utilization, the opposite factors like the restricted capability of single path reduces the accessible output (2006). Secondly, considering the unreliable wireless links single path routing isn't versatile to link failures and network performance degradation. In alternate route selection, once the

first path has non-continuous to continue transmission can cause an additional overhead and increase delay in data delivery. Due to these factors single path routing cannot be thought about as an effective technique to fulfill the performance demands of varied applications. To overcome these performance problems and to cope up with the constraints of the single path routing strategy, multi-path routing strategy conjointly called alternate path routing came into existence. Because the name suggests, that there will be multiple paths established between the source and destination, through that, the information will reach the destination (2006). Currently however these links used are altogether supported the individual routing strategy.

II. METHODOLOGY

Proposed System
1. Propose three main features such as
   - PSO
   - Optimal routing
   - Convergence time calculation
2. For attain the PSO we use energy, position of each node in the wireless network and distance as parameter
3. The result of PSO is to provide the best CH Node.
4. In opportunistic routing we maintain a packets throughout the destination using DSDV protocol. Meanwhile congestion window is maintained.
5. If the node is further from source then volunteer is participated depends on the distance.
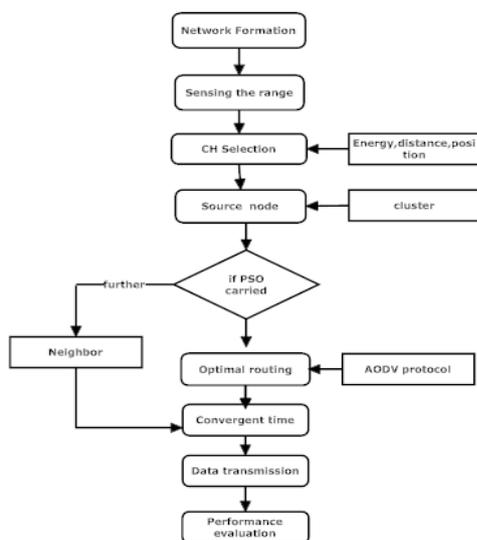

Figure 1: flow diagram of proposed system.

III. RESULT

This research proposes an PSO-Based Clustering Energy Optimization algorithm for Wireless Sensor Network in which clustering and clustering head selection are done by using Particle Swarm Optimization (PSO) algorithm with respect to minimizing the power consumption in WSN.
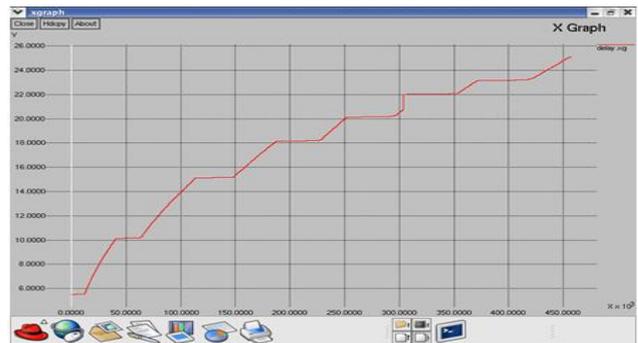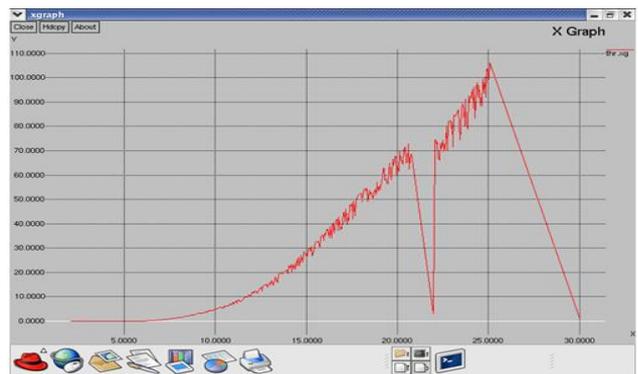

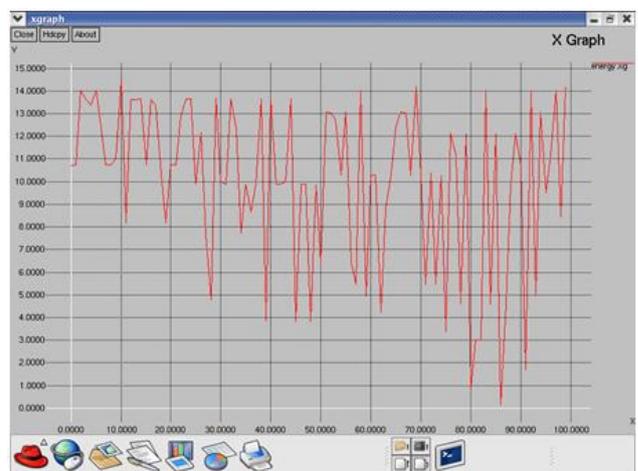**Figure 2:** delay.

Figure 3: Throughput.

Figure 4: Energy.

Figure 5: Packet Delivery Ratio.

IV. CONCLUSION

In our routing algorithm, the control nodes are assigned different tasks dynamically. Meanwhile, we utilize non-linear weight particle swarm optimization algorithm to create a cluster structure so as to minimize the transmission distance and to optimize the energy consumption of the network. Simulation results suggest that the proposed protocol is capable of prolonging the network lifetime. The network performance of the WSNs is enhanced by various PSO-based clustering and cluster head selection scheme algorithms in terms of increasing the throughput, packet delivery ratio, residual energy, and number of active nodes. The enhanced PSO algorithm constructs clusters in a centralized manner within a base station and the cluster heads are selected by using PSO in distributed manner. The sensed data from the sensor nodes are aggregated by the head and transmit to the BT directly or using relay node based on the threshold value for which the multihop routing protocol is used.

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