Simulation of Efficient Life-Time in Clustering Approaches for New Approach in Wireless Sensor Network

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Abstract— Wireless Sensor Network (WSN) is a multi-hop sensor network system in which sensor nodes are deployed in monitoring area to sense some environmental parameters. WSN is used to bridge the gap between physical world of humans and virtual world of electronics. Clustering is an important issue in WSN. Information gathering and routing are carried out based on the position of the sensor node. This paper does a detail simulation of the different clustering algorithms considering Energy Consumption Value, Latency Value, Packet Delivery ratio and Residual energy. Simulation results are discussed to describe the effect of CH selection and the size of the cluster. In addition we proposed a new clustering approach which uses reduction in number of clusters and CHs prolongs network lifetime.

Keywords — Wireless sensor network, Location based routing Remote• sensing, on• line sensors.

I. INTRODUCTION

In wireless sensor network (WSN) the sensor nodes are often grouped into individual disjoint sets called a cluster. Each cluster comprises of Cluster Head (CH) and its members [1] with partial energy resource, and usually a base station to collect and process the data from sensor nodes. One of the significant aspects of WSNs is the designing of energy efficient routing protocols. Clustering-based routing protocols are more constructive in the context of energy efficiency where numerous sensor nodes in the communication range of one another form a cluster. Each cluster has a cluster head (CH), which coordinates all the nodes of a cluster. A number of base stations (BS) also known as sink in a WSN are those that communicate with other networks. A CH aggregates data that are received from all member nodes of a cluster and sends to the BS. Besides CH, there exist gateway nodes in a cluster which are used for inter-cluster communications. Hence, clustering protocols produce limited useful information from large amount of raw sensed data.

II. LITERATURE REVIEW

Chun-Wei Tsai et al, One of the most well-known clustering methods for wireless sensor network is, no doubt, the so-called low energy adaptive clustering hierarchy (LEACH) because it is simple and easy to implement. Although LEACH tries to provide a fair selection mechanism by randomly selecting a number of sensors as the cluster-heads, it does not take into account the distribution of sensors, the main reason that LEACH is not able to allot transmissions to sensors efficiently, so it will make sensors far from the base station consume more energy in some cases. An efficient clustering algorithm to overcome this problem is presented in this paper. The proposed algorithm leverages the strength of a novel metaheuristics, search economics, and LEACH-centralized (LEACH-C) for wireless sensor network (WSN). Simulation results show that the search economics based clustering algorithm is capable of not only prolonging the lifetime of a WSN but also providing a balance strategy for the energy consumption of sensors in a homogeneous WSN[5].

Arun Kumar et al (2017), the network size is scalable without increasing the signalling overhead as routing decisions are inherently localized. Here, each node is aware of its position in the network through some positioning device like GPS and uses this information in the routing mechanism. In this paper, we first discuss the basics of WSNs including the architecture of the network, energy consumption for the components of a typical sensor node, and

draw a detailed picture of classification of location-based routing protocols. Then, we present a systematic and comprehensive taxonomy of location- based routing protocols, mostly for sensor networks. All the schemes are subsequently discussed in depth. Finally, we conclude the paper with some insights on potential research directions for location-based routing in WSNs. First, we presented a short introduction of WSN, sensor node and their applications followed by short discussion of MAC protocols and some basic ad-hoc network protocols. Then we presented a detailed overview and issues involved with location-based protocols in WSN as well as the advantages and disadvantages of each routing technique. We also presented the design trade-offs between some of the routing paradigms in various matrices such as mobility, energy awareness, QoS, scalability and so on [4].

Akbari et al. designed the suitable techniques to maintain the cluster structure during the two scenarios such as faulty condition and energy drained cases. On the basis of the residual energy, the Cluster Head (CH) and secondary CH were selected. The energy consumption and the remaining energy available during the cluster formation were measured effectively. The lifetime improvement, fault discovery and recovery were the major constraints in effective communication.

III. New Approach

In this section, we present the working principle of our proposed LACBRP algorithm in several phases. The proposed algorithm works with the following assumptions.

• Once a node is selected as a CH, it remains in the same cluster.

• Initially, all sensors have the same energy.

• A node in each cluster is work only for localization. This node is known as an anchors node.

• Sensors are heterogeneous in terms of their roles since they work as anchor nodes, cluster heads and cluster members.

VI. Scope of Future Work:

WSNs are widely being used in location monitoring, military surveillance etc. In these cases, the information transmitted from the nodes to the base station should be secure (i.e.) communication between two nodes must be encrypted. This requires the generation of secure keys between the sensor nodes in the WSNs to avoid attackers. Finally, future works need to investigate the methods to handle the challenges associated to the mobility of the nodes in the network such as the topology changes in the node-mobility applications.

V. Conclusion

The performance of proposed LACBRP protocol with the existing clustering protocols LEACH, BSP and BEC. Simulation Result illustrate that proposed LACBRP outperforms than LEACH but has almost similar performance to BSP and BEC protocols in terms of network energy consumption. All other routing schemes i.e. LEACH routing scheme, Base Station Position routing scheme and Energy-Balanced routing scheme maintain a certain level of Residual Energy, lower than the LACBRP scheme, due to the energy dissipation in different simulation time.

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