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To improve the Efficiency and Efficient Energy of Wireless Sensor Network using Non-linear Weight Particle Swarm Optimization Algorithm (NWPSO)

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ABSTRACT

There are many researches going on wireless sensor network in which software defined wireless network is very important to configure after the deployment. In this research paper, we propose an energy-efficient routing algorithm for software defined wireless network SDWSNs. In this algorithm the main work is focused on to increase the performance of system and efficient energy transmission to the network. To control the selection of nodes there occur a problem that is known as NP hard problem to resolve this type of problem we have proposed the non- linear weight particle swarm optimization algorithm. The simulation results show the using this algorithm the performance of system is improved and efficiency of network is increased. When the network act as a non- functional manner then the system lifetime is defined as the time span from deployment to the instant of the nodes [39]. According to the periodic data collection applications there is proper definition of lifetime is the time span as between the start of network operation and the time when the first node of the network dies. Using this algorithm the efficiency and system lifetime is improved and communication between transmitter and receiver also improved.

Index terms: coverage problem, detecting holes, NWPSO wireless sensor network, patching holes, selection of control nodes.

I.INTRODUCTION

An evolution of large amount of data and cloud technology there is wide range of development in wireless sensor network. [1– 4]. A sensor node is normally comprised of one or more sensor units, a power supply unit, a data processing unit, data storage, and a data transmission unit [5]. A wireless sensor network is defined as it is the collection of wireless mobile nodes and finite energy that is may be dynamic and stationary and located dynamically with changing environment. Wireless sensor networks has the wide range of applications such as environmental sensing, habitat monitoring and tracking, military defence, etc. [6]. With the quality of low power, low cost and low consumption there is wide range of attraction related to research. In the sensor network there is each node in the network acts as both sensor and router with the limited computing and communications capabilities and storage capacity.

However, there are many applications of wireless sensor network in which the formation and performance of sensor nodes in hard environment that

makes the system very difficult and expensive[16–18]. Due to this there are many applications in which sensor nodes operate very long time without replacement of battery. Therefore the energy constraint is very important for the design of WSNs [19] and SDWSNs. In the software defined wireless sensor network there are many virtual networks work together on the same physical infrastructure but in the centralized control plane have high energy cost to collection of information resources in global view. Therefore the utilization of resources is very important to design the software defined wireless sensor network. How to select the control nodes in the network , that is main target in this research paper and this algorithm that is constructed by the control server. The control nodes in the network provide the task to the intracluster nodes in the system that is used to collect the data from the cluster and transmitted to the control server. Due to this the control nodes on the network consume the more energy than the other nodes. As a result, the control server in the network is used to select the control nodes with higher residual energy and the better location according to the location of the control server among the sensor nodes, and then forms clusters with an equal distribution of the sensor nodes based on their locations and residual energy. This problem can be seen as an NP-hard problem. To resolve NP hard problem and control the nodes we have used the non-linear weight particle swarm optimization algorithm.

Result:

To control the selection of nodes we have proposed the non-linear weight particle swarm optimization algorithm due to this algorithm the system lifetime of the system is increased and the communication between transmitter and receiver is also improved. In the Figure 1 there is showed the deployment of the nodes in the network and Figure 2 shows that how many nodes are alive when we apply the nonlinear weight particle swarm optimization algorithm, here we see that using this algorithm nodes are alive at every round due to this communication process is going on continuously. The figure 3 shows that the fitness value of the nodes every round is improved due to this system lifetime is also improved.

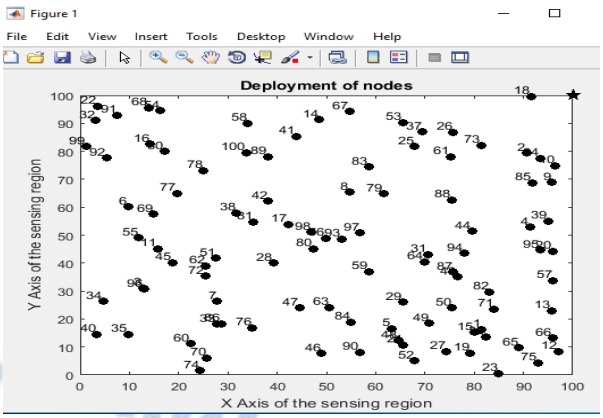

Fig.1 Deployment of the Node

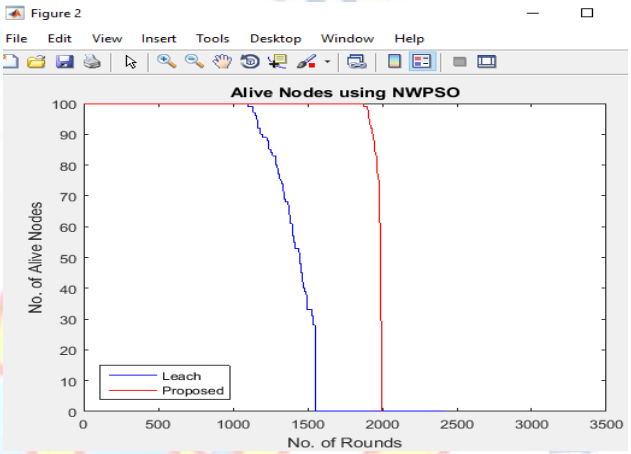

Fig.2 Alive nodes using NWPSO

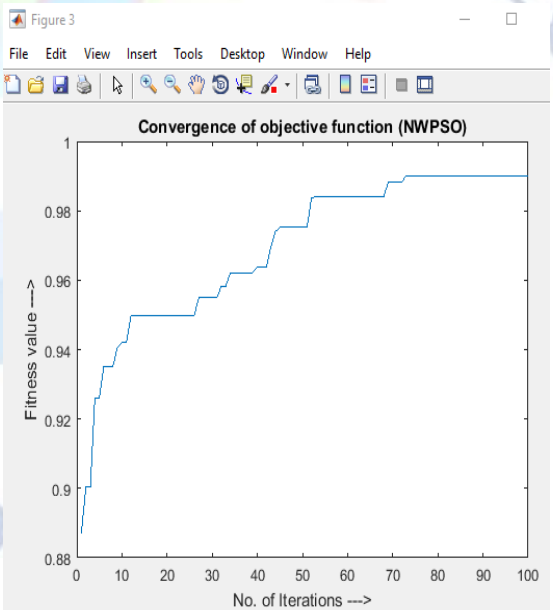

Fig.3 Fitness value of nodes.

CONCLUSION:

The paper provide solution for the distributed coverage hole detection and patching in coordinate-free wireless sensor networks, which based on perpendicular bisector and boundary critical points. Simulation results show that the alive nodes provide the successful transmission between transmitter and receiver at every round and fitness value of every node at every round is improved. The algorithm is very effective and useful to selection of control nodes in the network.

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