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## Energy Efficient To Maximize Lifetime and Target Coverage in Wireless Sensor Network

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**ABSTRACT:** The overall objective is to identify optimal deployment locations of the given sensor nodes with a pre-specified sensing range, and to schedule the sensor nodes such that the network lifetime is maximum with the required coverage level. It gives an overview of the routing algorithms and their real purpose: to direct traffic from sources to destinations maximizing network performance while minimizing the costs. Since, Area coverage focuses on monitoring the entire region of interest, whereas target coverage concerns monitoring only certain specific points in a given region the network security and coverage problem can be resolved much better than the existing system

### 1.INTRODUCTION

Wireless Sensor Networks (WSNs) are important for many applications such as military sensing, physical security, air traffic control, traffic surveillance, video surveillance, industrial and manufacturing automation, environment monitoring, and building and structural monitoring. Network lifetime (defined as the time instant from which the network starts functioning to the time instant where the desired coverage criterion is not satisfied) is a crucial factor that determines the efficiency of a wireless sensor network. Energy usage should be curbed to achieve enhanced lifetime.

This is because sensor nodes are battery powered and cannot be easily recharged or replaced. Coverage in a WSN needs to guarantee that the region is monitored with the required degree of reliability. Locations of sensor nodes constitute the basic input for the algorithms that examine coverage of the network. Coverage problems can be broadly classified as area coverage problem and target coverage problem.

### II. EXISTING SYSTEM

In wireless sensor network there are two types of sensor node deployments, random deployment and deterministic deployment. Random deployment is suitable for applications where the details of the regions are not known, or regions are inaccessible. An example of random deployment of sensor nodes would be in battlefield surveillance. In such a deployment, the most common way of extending the network lifetime is by scheduling the sensor nodes such that only a subset of sensor nodes that is enough to satisfy coverage requirement need to be active at a time.

In deterministic deployment, the details of the region will be known a priori and since a provision of deploying nodes at specific locations prevail, there exists two ways by which network lifetime can be maximized. One is at deployment phase and the other is at scheduling phase. Given a region with targets being monitored by sensor nodes, the upper bound of network lifetime can be mathematically computed. This information can be used for computing locations which would be appropriate for coverage to be satisfied as well as network lifetime to be maximum. Once the deployment locations are computed, sensor nodes can be scheduled to achieve the optimum lifetime. Sensor deployment and scheduling in this way contributes equally to extend the network lifetime. Hence the problem can be summarized as: Given some sensor Nodes that can be deterministically deployed, where to deploy them and how to schedule them so as to achieve the required target coverage level and maximize the network lifetime.

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## III. PROPOSED SYSTEM

The sensor nodes can be deterministically deployed; the optimal deployment locations and the schedule are decided at the base station, prior to actual deployment. The proposed method has two phases: sensor deployment and sensor scheduling. The nodes are initially deployed randomly. Based on the theoretical upper bound of network lifetime, we compute the optimal deployment locations using ABC algorithm. A heuristic is then used to schedule the sensor nodes such that the network lifetime is maximum.

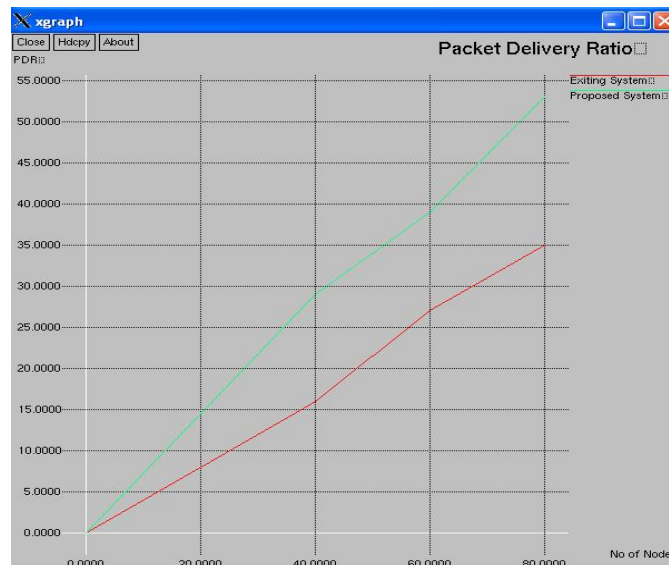
Here we propose a heuristic for sensor deployment. Initially, place the sensor nodes randomly. If any sensor node is idle (without monitoring any target), the node is moved to the least monitored targets' location. This is to ensure that all sensor nodes play their part in monitoring the targets. The sensor nodes are then sorted based on the number of targets it cover. The sensor node is placed at the middle of all the targets it covers. The next nearest target is identified and the sensor node is placed at the middle of all these targets. If it can cover this new target along with targets it was already monitoring, allow this move, and else discard the move. This is done till the sensor node cannot cover any new target. At the end, upper bound is computed. The drawback of this approach is that it depends on the initial position of the sensor nodes. Though it may perform well for dense deployments, consistency cannot always be guaranteed.

### 3.1 ADVANTAGES

- To achieve area coverage, we look at target coverage with a goal to maximize network lifetime.
- ACO algorithm to solve simple coverage problem.
- The number of targets is more compared to the number of sensors to be deployed.
- To save energy by minimizing the sensing range requirement for the sensors.
- Path loss can be reduced since it has a trace on its path.
- Data flow will be maintained.
- Reliability is more comparing to ABC Algorithm.

## IV. SYSTEM OUTPUT

### 4.1 Packet Delivery

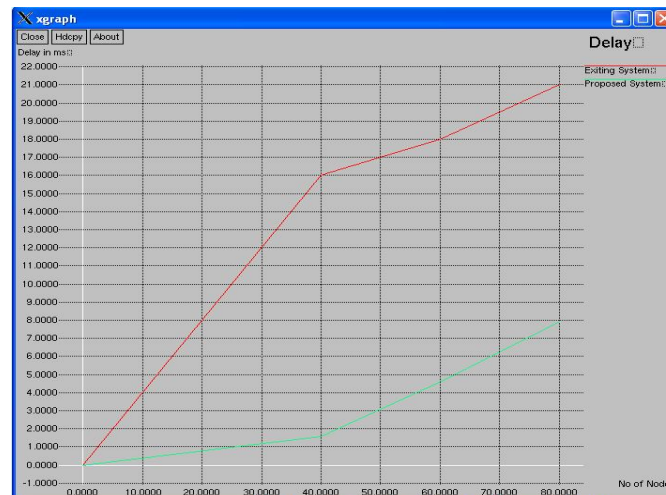


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## 4.2 Delay



## V. CONCLUSION

The deployment locations will be computed for sensor nodes using Ant Colony Optimization algorithm such that the network lifetime is maximum. Ant Colony Optimization algorithm performs better than PSO algorithm for this problem. In order to avoid the battery drain of all nodes at a time, sensor node scheduling can be done so that only minimum number of sensor nodes required for satisfying coverage requirement needs to be turned on. The other nodes can be reserved for later use. This method helps to prolong the network lifetime. A heuristic is used which is powerful enough to schedule the sensor nodes in such a way that the network lifetime matches the theoretical upper bound of network lifetime. Network life time is extended by using this method of deploying at optimal locations such that it achieves maximum theoretical upper bound and then scheduling them so as to achieve the theoretical upper bound.

## 5.1 FUTURE ENHANCEMENT

For future work, the plan is to extend this method of deployment and scheduling for probabilistic coverage in wireless sensor networks. The sensor nodes are highly supportive by deploying it also they are efficient when the battery is saved. So by combination of algorithm we can get better results for reliable coverage area also for efficient transaction of data packets. Both deployment and scheduling can be done better with the combinations of algorithm in an effective manner.

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