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Routing Based Wireless Sensor Network Design for Mobile Target Detection

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Abstract: *Selecting the locations of mobile targets moving in a given area optimizes WSN topology and maximizes the efficiency of the framework. We propose to add routing to identify the positions of the nodes of Wireless sensor networks (WSNs) where the surveillance applications run through. Routing enhances the existing system of identifying the positions effectively by increasing the speed of the application.*
Index Terms: *Wireless Sensor Networks (WSNs), Mobile Target Detection, Routing.*

I. INTRODUCTION

A Wireless Sensor Network (WSN) is a self-configuring network of small sensor nodes communicating among themselves using radio signals, and deployed in quantity to sense, monitor and understand the physical world. It consists of spatially distributed autonomous sensors to monitor physical or environmental conditions, such as temperature, sound, vibration, pressure, motion or pollutants and to cooperatively pass their data through the network to a main location.

The more modern networks are bi-directional, enables to control the activity of the sensors. The development of wireless sensor networks was motivated by military applications such as battlefield surveillance; today such networks are used in many industrial and consumer applications, such as industrial process monitoring and control, machine health monitoring and so on.

Edoardo Amaldi, Antonio Capone, Matteo Cesana, Ilario Filippini proposed a scheme that the performance measures proposed for quality evaluation can also be used to drive/improve network deployment. The type of deployment approach and the available degrees of freedom clearly depend on the application field and the accessibility of the specific environment. Whenever the environment is fully accessible by the network planner, sensors positions can be predetermined and optimized. If the environment is hard to reach and/or hostile, or if node-by-node positioning is too expensive, random positioning may be the only alternative.

Considerable attention has been devoted to both scenarios. In the former one, the problem of sensors positioning is often tackled through mathematical optimization approaches to cover a set of target points. In the latter one, the main focus is on the evaluation of the minimum node density providing the required quality, or on energy saving strategies, often based on partitioning the set of installed sensors.

II. The Proposed Scheme

In this paper, we focus on fully accessible environments where sensors positions can be actually optimized. Previous work on this topic relies on the general 0–1 coverage model based on the sensing range. A common approach is to select a set of nodes satisfying some connectivity conditions and guaranteeing that each point of the area is within the range of sensors (k-coverage). These models are appropriate for monitoring applications devoted to large-scale measurements or to the detection of localized and static target events.

In this paper, instead we propose an optimization framework for the problem of positioning sensors where the sensing quality depends on the distance from the sensor node. In particular, the application scenario is mobile target detection, and sensing quality is based on the concept of path exposure. Mobile targets detection is of utmost importance in several practical scenarios, including border protection/surveillance and critical areas surveillance (museums, factories, departments, etc.).

To the best of our knowledge, this work is the first attempt to provide a wireless sensor network planning methodology where coverage is not just based on the sensing range (0–1 coverage model), but its quality depends on the distance from the sensor node (path exposure model). Indeed, previous work on mobile target detection using the concept of exposure focuses on assessing the performance of randomly deployed WSNs, identifying the most/least-exposed paths for given network topologies, computing the minimum node density that guarantees a given quality, and optimizing multiphase random deployment

The design of a WSN for mobile target detection requires a completely different deployment approach. In the classic coverage model, the entire area must be monitored to detect targets. Here, instead the goal is to detect a target that crosses a protection border, moving from an external area to a sensible area. Therefore, the objective is not to detect an intruder at any point in the area, but to detect the crossing attempt. As we will see in Sections II–VII, the sensor deployment pattern tends to be a"dense" barrier that the intruder is forced to go through in order to cross the area. The classic coverage model instead leads to more uniform deployment patterns, which usually require a higher number of installed sensors than those needed for mobile target detection.

III. Our Model

We follow the above model and try to modify their algorithm to improve the performance of the packet transit. By invoking suitable algorithm, we try to identify the position of sensors and try to improve the same using routing.

The main objective is to position the sensors of a WSN in order to achieve high detection quality along paths traversing the area of interest. Besides the aforementioned work, the position of sensors can be detected much more efficiently using routing algorithm in WSN.

IV. Data Analysis

Energy Consumption

In sensor networks, consumed energy is the primary performance measure. Here energy consumption is considered as an important factor to identify the compromised nodes in the network. Fig 1 graph compares the energy consumption for path with compromised node and alternate path with no compromised nodes.

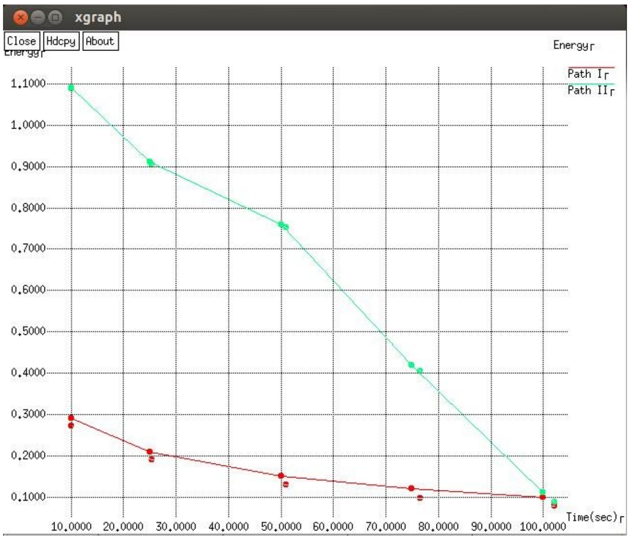

Fig. 1.

Packets Received

The packets dropped can be identified by calculating total number of packets received by sink. Fig 2 graph shows packets received with respect to time. When the received packet is less compared to transmitted packets, then it may be dropped.

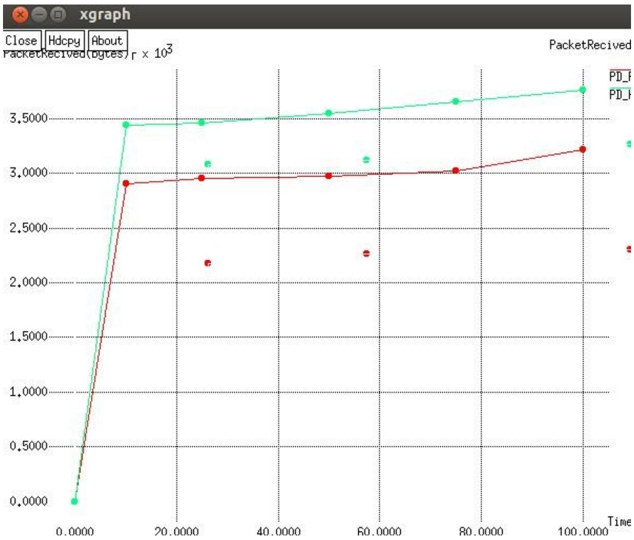

Fig. 2.

V. CONCLUSION

In this paper, the positions of sensors in WSN are identified and located using routing to achieve better scalability. The routing is performed to identify the shortest path between the nodes.

Delay

Delay of each packet is calculated. When delay is increased, there is a chance for modification. The delay is calculated for each packet form one node to another. Fig 3 shows delay is calculated for each packet.

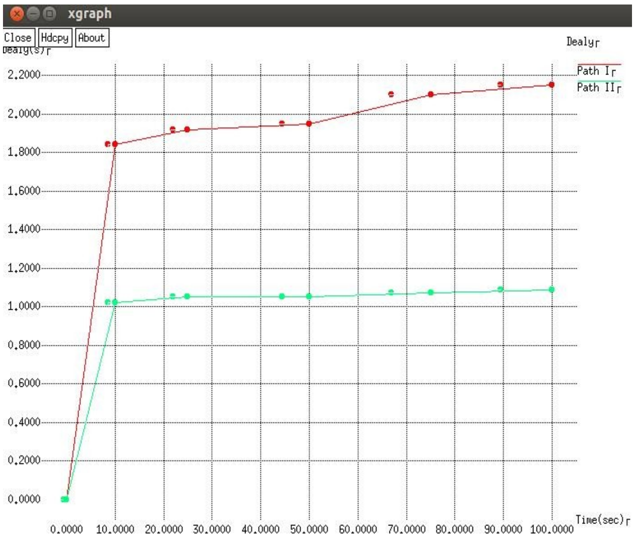

Fig. 3.

REFERENCES

[1] Edoardo Amaldi, Antonio Capone, Senior Member, IEEE, Matteo Cesana, Member, IEEE, and Ilario Filippini, Member, IEEE "Design of Wireless Sensor Networks for Mobile Target Detection"

[2] I. F. Akyildiz, W. Su, Y. Sankarasubramaniam, and E. Cayirci, "A survey on sensor networks," IEEE Commun. Mag., vol. 40, no. 8, pp. 102–114, Aug. 2002.

[3] C. F. Huang and Y. C. Tseng, "The coverage problem in a wireless sensor network,"Mobile Netw. Appl., vol. 10, no. 4, pp. 519–528, Aug. 2005.

[4] K. Kar and S. Banerjee, "Node placement for connected coverage in sensor networks," presented at the IEEE WiOpt, 2003.

[5] Y. Zou andK. Chakrabarty, "Sensor deployment and target localization in distributed sensor networks," Trans. Embed. Comput. Syst., vol. 3, no. 1, pp. 61–91, 2004.

[6] A. Howard, M. J. Mataric, and G. S. Sukhatme, "An incremental self deployment algorithm for mobile sensor networks," Autonom. Robots, vol. 13, no. 2, pp. 113– 126, 2002.

[7] C. F. Huang, Y. C. Tseng, and L. C. Lo, "The coverage problem in three-dimensional wireless sensor networks," World Sci. J. Interconnect. Netw., vol. 8, no. 3, pp. 209– 227, 2007.

[8] Q. Wu, N. S. V. Rao, X. Du, S. S. Iyengar, and V. K. Vaishnavi, "On efficient deployment of sensors on planar grid," Comput. Commun., vol. 30, no. 14–15, pp. 2721–2734, 2007.

[9] S. Kumar, T.H. Lai, and J. Balogh, "On k-coverage in amostly sleeping sensor network," Wireless Netw., vol. 14, no. 3, pp. 277–294, 2008.

[10] C. F. Huang, Y. C. Tseng, and L. C. Lo, "Distributed protocols for ensuring both coverage and connectivity of a wireless sensor network," Trans. Sensor Netw., vol. 3, no. 1, 2007, Article no. 5.