A Novel Method for Event Detection using Wireless Sensor Networks

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──── **Abstract** ────

Reliable event detection is one of the hottest research areas in the wireless sensor networks field these days. Battlefield monitoring, fire detection, nuclear and chemical attack, and gas leak detection are examples of the event detection applications. One of the main goals to WSNs is transmitting the sensed data to the sink (Base station) in an efficient way with minimum energy usage to achieve high degree of event detection reliability. Thus, Its very important to determine the reliability degree to know the number of data that are required to receive at the sink to achieve the desired reliability.

Most of the previous research works proposed different solutions for reliable event detection. The idea of all these solutions is based on increasing the amount of the transmitted data to the sink by controlling the sources reporting rate. However, rising the reporting rate may lead to losing the transmitted data due to the network congestion and packets collision, and this is related to the restricted resources capacity of the network's sensor nodes.

Therefore, in this paper, a new indoor method to achieve quality based event reliability for critical event detection have been implemented using hardware sensor nodes (Waspmote). The idea of this method is depending on sending the sensed data to the sink using a node called Cluster Head (CH) in a sequence according to their priority from the high to the low. The network nodes have been deployed in the experiment area into clusters, and each cluster have a CH node which work on collecting the cluster members readings and reorder it in descending order to send it next to the sink. The probability to deliver the important data to detect the event to the sink will increase by using this new method. The proposed mechanism intends to improve the event detection reliability, minimize the end-to-end delay, and increase the network lifetime. Experiments results show that the proposed method achieved a good the performance in terms of packets delivery, event detection, and end-to-end delay.