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Barrier Coverage of a Wireless Sensor Network is a Critical Issue in Military and Homeland Security Applications

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Editorial

The Wireless sensor networks can now be deployed on a wide scale and at a low cost thanks to recent advancements in embedded software/hardware architecture (WSNs). Such a network exists, consists of a large number of miniature sensor nodes that can sense, compute, communicate, and control each other. The wireless Sensor networks can be used for a wide range of purposes, including wildlife monitoring, combat surveillance, and more border control and disaster relief are two topics that have piqued the interest of both academia and industry. Last ten years in most cases, a wireless sensor node has restricted capabilities in communication and computation, as well as. In most applications, power supplies are tightly restricted and the networks are frequently used in hostile, unattended contexts large-scale project design and deployment success.

As a result, wireless sensor networks necessitate technological advancements. as well as integrations in a variety of domains, such as integrated data processing, hardware design. Despite the fact that many tremendous efforts have been made in the study of wireless sensor networks, one of the most pressing difficulties in WSNs is the development of a sustainable and scalable system that achieves extended network lifetime and predictable services. Many WSN systems have designed and implemented nodes capable of capturing ambient energy. The advantages of employing rechargeable batteries to extend sensor network lifetime by gathering environmental energy are well known. However, finding a balance between system cost and reliability remains a difficulty. Investigate the barrier coverage of a line-based sensor deployment approach and how to improve barrier coverage by utilising sensor mobility. They start by establishing a tight lower-bound for the presence of barrier coverage in a line-based deployment [1-3].

When the random offsets are modest compared to the sensor's sensing range, their results reveal that the barrier coverage of the line-based deployment greatly beats that of the Poisson model. They also devised an efficient algorithm to reposition mobile sensors based on the deployed line to optimise barrier coverage, taking advantage of the performance of line-based deployment. The algorithm locates barrier gaps and then repositions mobile sensors to fill them while balancing energy usage among mobile sensors. Examine how a line-based sensor deployment strategy's barrier coverage can be improved by utilising sensor mobility. They begin by establishing a strict lower-bound for the presence of barrier coverage in a line-based deployment. When the random offsets are modest compared to the sensor's sensing range, the barrier coverage of the line-based deployment greatly beats the Poisson model. They also devised an efficient algorithm to reposition mobile sensors based on the deployed line to optimise barrier coverage, allowing them to take advantage of the performance of line-based deployment. The programme locates barrier gaps and then moves mobile sensors to fill them while balancing energy usage among mobile sensors.

Environmental energy harvesting has been viewed as one of the most fundamental solutions for long-term applications in order to assure the long-term operation of wireless sensor systems. Because energy storage equipment (such as batteries or capacitors) are limited in capacity and prone to leakage in energy-dynamic environments, energy conservation is no longer regarded to be useful. Strive for energy-synchronized computation for wireless sensor systems, which is different from previous energy conservation methodologies. They propose and apply leakage-aware feedback control approaches to match the activities of sensor nodes with dynamic energy supply from environments in order to make efficient use of the captured energy. They test the system in both indoor and outdoor environments that are representative of real-world scenarios. Our leakage-aware energy synchronized control can effectively use energy that migaht otherwise leak away, according to the results [4,5].

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Conflict of Interest

The Author declares there is no conflict of interest associated with this manuscript.

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