Abstract

As wireless sensor networks (WSNs) continue to attract more and more researchers attention, new ideas for applications are continually being developed, many of which involve consistent coverage with good network connectivity of a given region of interest. One of the important challenges of the wireless sensor networks is problem of having coverage while keeping connectivity. These are two closely related and also very essential prerequisites. They are also very important measurements of Quality of Service (QoS) for wireless sensor networks. Rather than considering sensing coverage and networking connectivity as two separate sub problems, the proposed protocol attempts to integrate them in a single algorithm. Each and every sensor node has a priority assigned to it, in the proposed distributed algorithm. This paper presents the design and analysis of novel algorithm Efficient Energy, Coverage and Connectivity (ECC/ EC2) Algorithm that can dynamically configure a wireless sensor network to result in ensured degrees of coverage and connectivity. This algorithm is simulated using NS2 and compared against integrated CCP with SPAN [5] algorithm and also with Distributed Probabilistic Coverage-preserving Configuration Protocol (DPCCP)[6] with SPAN protocol in the literature and show that it activates lesser number of sensor nodes, consumes much lesser energy and
enhances the network lifetime considerably.

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Index Terms

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