

Lecture Notes in Electrical Engineering 478

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# Comparative Analysis of Energy Consumption in Sensor Node Scheduling Heuristics in Wireless Sensor Network



Sunita Gupta and Sakar Gupta

**Abstract** Wireless Sensor Networks (WSNs) are commonly used in many wireless applications like battlefield, environmental monitoring, etc. WSN is consisting of an excess of sensors that operates for many months to years to complete their assigned tasks. Due to the small size of a sensor node, the power supply attached to the sensor node is very limited in size. Thus, energy conservation becomes a challenging issue in WSN design and researchers face problem to get long operating hours without affecting the system performance. In this paper, a hardware and battery models are surveyed that can affect battery life and cause the difference between the simulation and application results. Varieties of mathematical models have been studied to serve as analytical tools in quantifying battery utilization and discharge characteristics. However, batteries are the primary power supply source. They fail earlier in some applications than their projected working time. So Energy Harvesting WSN (EHWSN) can be used if possible. This paper compares and shows a pattern of battery utilization in lifetime maximizing heuristics for WSN. In (Gupta and Roy Global J Comput Sci Technol E Netw Web Secur 15(6), 2015 [1]), proposed a heuristic called Q-Coverage Maximum Connected Set Cover (QC-MCSC) and it is used for energy minimization. It schedules the activities of nodes having Q-Coverage and Connectivity constraints. QC-MCSC is compared with existing heuristics, High Energy Small Lifetime (HESL), Triple Phase Iterative Connected Set Cover (TPICSC) and Maximum Set Cover (MSC). In this paper, a comparison of performance of QC-MCSC heuristic is done with existing heuristics over battery utilization pattern in WSN.

**Keywords** Wireless sensor network · Energy consumption and battery model Coverage and connectivity

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