World Academy of Science, Engineering and Technology
International Journal of Computer and Information Engineering
Vol:11, No:05, 2017

Aggregation Scheduling Algorithms in Wireless Sensor Networks

Authors : Min Kyung An

Abstract : In Wireless Sensor Networks which consist of tiny wireless sensor nodes with limited battery power, one of the most fundamental applications is data aggregation which collects nearby environmental conditions and aggregates the data to a designated destination, called a sink node. Important issues concerning the data aggregation are time efficiency and energy consumption due to its limited energy, and therefore, the related problem, named Minimum Latency Aggregation Scheduling (MLAS), has been the focus of many researchers. Its objective is to compute the minimum latency schedule, that is, to compute a schedule with the minimum number of timeslots, such that the sink node can receive the aggregated data from all the other nodes without any collision or interference. For the problem, the two interference models, the graph model and the more realistic physical interference model known as Signal-to-Interference-Noise-Ratio (SINR), have been adopted with different power models, uniform-power and non-uniform power (with power control or without power control), and different antenna models, omni-directional antenna and directional antenna models. In this survey article, as the problem has proven to be NP-hard, we present and compare several state-of-the-art approximation algorithms in various models on the basis of latency as its performance measure.

Keywords : data aggregation, convergecast, gathering, approximation, interference, omni-directional, directional
Conference Title : ICCCISE 2017 : International Conference on Computer, Communication and Information Sciences, and Engineering
Conference Location : Montreal, Canada
Conference Dates : May 11-12, 2017