Target Coverage in Wireless Sensor Networks

俞征武,游坤明,索維廷,林錦財,林臻義
Computer Science & Information Engineering
Computer Science and Informatics
cwyu@chu.edu.tw

Abstract

Coverage problems are fundamental and crucial in designing a wireless sensor networks. The target coverage problem is finding an optimal scheduling for sensors such that the time (called lifetime) to monitor every target can be as long as possible. Unfortunately, the target coverage problem has been proved to be NP-complete. Most of previous work only considers one or two factors exclusively and thus fails to prolong the lifetime to near the optimum. The main objective of this work is to design efficient scheduling algorithms to maximize the lifetime of a given whole wireless sensor network by considering adjusting sensing range, locations of target and sensors, residue battery power of sensor nodes, and assignment between sensors and targets simultaneously. A maximum weighted matching algorithm is devised by considering full coverage and the maximum total monitored duration for each target-sensor assignments. We also conduct simulations to demonstrate that the proposed algorithms can achieve very high network lifetime closed to the optimum.

Keyword：wireless sensor networks, target coverage, algorithm design