Observation on using Genetic Algorithm for Extending the Lifetime of Wireless Sensor Networks

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Abstract

Coverage is one of the main aspects in Wireless Sensor Networks applications like environment, health care, disaster prevention and military etc and is a measure of the quality of service of network. The goal is to cover each and every point in the physical location. Coverage of network is mainly effected by the sensing ranges of sensors in WSN. So, increasing the range of sensor can increase the coverage of network. Coverage can be classified into 2 types, area coverage and point coverage (Target Coverage). In this paper we address the target
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coverage problem. One of the main aspects of applications of wireless sensor networks is network lifetime. The network lifetime can be highly depends on sensors scheduling because in sensor network energy consumes for both sensing and communication. Coverage problem highly effects on network lifetime i.e. network functions until each target is covered by at least one sensor in network. Forming the sensors into maximal set covers is one of the efficient methods to extend the sensor network lifetime, in which the sensors presented in particular cover are activated and remaining sensors are in sleep mode. This paper proposes a modified genetic algorithm to increase the network lifetime by solving the coverage problem. Here we are forming disjoint set covers that is the sensors covered in one cover cannot be repeated. Experimental results are shown to verify our approach.

Reference

- X. Wang, G. Xing, Y. Zhang, C. Lu, R. Pless, and C. D. Gill, “Integrated Coverage and

**Index Terms**

Computer Science  
Genetic Algorithm

**Key words**

Wireless Sensor Network (WSN)  
Modified Genetic Algorithm

Algorithm  
Coverage  
Disjoint set covers problem  
redundancy  
Integer Programming  
Linear Programming