

# Dynamic Coverage Techniques in Mobile Wireless Sensor Networks

陳逸寧, 林克叡, 俞征武

Computer Science & Information Engineering

Computer Science and Informatics

cwyu@chu.edu.tw

## Abstract

Wireless sensor networks have a wide range of potential applications in recent years. One of the most important goals is to monitor and to detect interested environment. In order to reduce deployment cost and to maintain conveniently, there are increasing applications on mobile sensor networks. Specifically, there are many locations of interest in the deployed environment, and those locations must be visited by robotic mobile sensors many times within a predefined time interval in order to collect important information.

Most of previous studies have focused on planning path for robotic sensors, or on find the optimal number of robots with a given but limited time. However, there are few papers mention that each location in the interested environment may has a different quality of surveillance, so some locations of interest may need higher exploration by the robotic sensors, rather than to explore only once.

In this work, we define a novel coverage problem, called dynamic coverage problem, which finds the least number of robotic sensors (with circular patrol paths) to meet the desired surveillance quality. The new problem is defined to relax this traditional constraint so that some interested places need not to be monitored at all time. That is, different areas may require different surveillance qualities. We also propose a high density algorithm to tackle the problem. Simulations are also conducted to demonstrate the effectiveness of the proposed algorithms.

Keyword : Wireless Sensor Networks; Mobile Sensor Networks;