

## 一种无线传感器网络覆盖能耗平衡优化策略

作者: 顾晓燕, 孙力娟, 郭剑, 肖甫

单位: 江苏信息职业技术学院

基金项目: 中国博士后科学基金项目, 江苏省六大人才高峰项目, 江苏省博士后科研资助计划基金项目, 南京邮电大学青蓝计划资助项目,

摘要:

在无线传感器网络中, 对目标区域的覆盖程度以及网络能耗是衡量其性能的重要指标, 通过对节点的合理配置, 有利于保证网络覆盖, 平衡网络能耗。针对节点感知距离可调的无线传感器网络, 提出了一种无线传感器网络覆盖能耗平衡优化策略, 该策略以满足一定的网络区域覆盖质量为前提, 以覆盖能耗平衡为优化目标, 采用粒子群算法, 首先对网络中的节点布局进行动态优化, 在此基础上通过合理调整节点感知距离, 使得网络覆盖能耗性能最优。仿真结果表明, 与传统节能覆盖方案相比, 该策略能够有效减少感知重叠区和感知盲区, 提高网络区域覆盖质量, 降低网络能耗。

关键词: 无线传感器网络; 覆盖能耗平衡优化; 粒子群算法; 感知距离

## An Equilibrium Optimization Strategy on Coverage Energy Consumption in Wireless Sensor Networks

**Author's Name:**

**Institution:**

**Abstract:**

In wireless sensor networks, the coverage of the target area and the network energy consumption are important indicators of its performance. Through rational configuration of nodes, the network coverage can be guaranteed and the energy consumption can be balanced. This paper presents a coverage optimization strategy for energy balance in wireless sensor networks, in which the sensing distance of nodes is adjustable. The strategy achieves coverage energy optimization balance with a prerequisite of an acceptable coverage quality of network area. Using particle swarm algorithm, it firstly optimizes the layout of the nodes in the network, based on which it then adjusts the sensing distance of the nodes to achieve best energy consumption performance of the network coverage. The simulation result shows that the strategy can effectively reduce the overlapped sensing regions and blind regions comparing to traditional energy-saving coverage strategies. Therefore, the network coverage quality is improved and energy consumption reduced.

**Keywords:** wireless sensor networks; coverage energy balance optimization; particle swarm optimization; perception distance

投稿时间: 2010-05-07

[查看pdf文件](#)