

## 点能量密度平衡的无线传感器网络基站移动策略

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摘要:

数据收集是无线传感器网络的一个基本功能。由于部署在基站周围的传感器节点承担着网络内大部分的负载,因此导致能量迅速耗尽,现有的基站移动策略可以通过基站的移动实现网络内传感器节点的负载平衡以延长网络寿命。但是现有负载平衡的基站移动策略只能在传感器节点被均匀布撒的情况下才能有效地延长网络寿命,其他情况下不能达到延长网络寿命的效果。因此本文定义了点能量概念用以表示传感器网络对感知区域每个点的感知能量,并给出了有效的点能量密度计算方法。通过点能量密度消耗分析,提出了一种点能量密度平衡的基站移动策略(energy-density-balance base station movement,简称EDB-BSM)。通过理论分析和仿真试验验证,相对于固定基站模式和基站随机移动模式,该移动策略能够在各种传感器节点分布情况下有效的延长网络寿命,并具有良好可扩展性。

关键词: 传感器网络, 移动基站, 数据收集, 点能量密度, 网络寿命

## Energy-density-balance base station movement strategy in wireless sensor networks

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**Abstract:**

Data gathering is the basic function of wireless sensor networks. Because the sensor nodes located near a base station have to relay data for a large part of the network and thus deplete their batteries very quickly, present base station movement strategies can realize network load-balance by mobile base station. Load-balance base station movement schemes are not available to improve network life unless the sensor nodes are distributed uniformly. Thus, the concept of point energy density is defined in this paper to represent the energy which every point used to sense environment, and an effective method for calculating point energy density is proposed. In this paper, an EDB-BSM (energy-density-balance base station movement) strategy is proposed after analyzing the point energy density dissipation. Compared with the static base station scheme and the random base station movement scheme, EDB-BSM can improve network life in every condition of sensor node distribution, and is proved to be extensible.

**Keywords:** wireless sensor networks, mobile base station, data gathering, point energy density, network life

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