

论文

# 基于冗余节点休眠和分阶段唤醒策略的传感器网络三维覆盖控制方法

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摘要

该文针对无线传感器网络中节点能量有限且密集布点时存在大量冗余节点的情况, 提出了基于冗余节点休眠和分阶段唤醒策略的无线传感器网络3维覆盖控制方法。在3维待监测区域中随机配置大量传感器节点, 达到高密度分布, 使冗余节点处于休眠状态, 等待活跃节点能量耗尽之后, 分阶段唤醒休眠节点, 直至整个传感器网络中所有节点的能量都耗尽为止。仿真结果表明, 该方法提高了传感器网络的网络性能, 且对相同的传感器节点数, 分阶段唤醒策略优于不分阶段的唤醒策略, 先使冗余节点休眠之后再唤醒方法的网络性能高于直接唤醒方法的网络性能。

关键词 [无线传感器网络](#) [三维覆盖](#) [冗余节点休眠](#) [分阶段唤醒](#)

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## 3D Coverage Scheme Based on Hibernation of Redundant Nodes and Phased Waking-up Strategy for Wireless Sensor Networks

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Abstract

For wireless sensor networks, the energy of sensor node is very limited, and there are a lot of redundant nodes when it is densely deployed. Therefore, a 3D coverage scheme based on hibernation of redundant nodes and phased waking-up strategy for wireless sensor networks is proposed. A large number of sensor nodes are randomly deployed in the monitoring region and the redundant nodes can hibernate. The hibernated nodes will be waken up in phases after the on-duty nodes are exhausted. The process of hibernating/waking-up lasts until all of the nodes in the entire sensor network are exhausted. The simulation results show that this method improves the network performance. Besides, with the same number of nodes deployed in the 3D monitoring region, the phased waking-up strategy outperforms the none-phased waking-up strategy, and waking up the nodes after hibernation achieves higher network performance than the method of directly waking up in turn.

Key words [Wireless sensor networks](#) [Three-dimensional coverage](#) [Hibernation of redundant node](#) [Phased waking-up](#)

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