

论文

WSNs中基于能量代价的最小权和支配集拓扑控制算法

孙超, 尹荣荣, 郝晓辰, 刘彬

燕山大学信息科学与工程学院 秦皇岛 066004

收稿日期 2009-3-16 修回日期 2009-9-21 网络版发布日期 2010-4-7 接受日期

摘要

该文针对无线传感器网络中最小连通支配集拓扑并非网络耗能最小拓扑的问题, 定义由节点剩余能量, 邻居个数和通信代价构建的能量代价函数综合反映支配节点的能量效率以及对降低网络整体能耗的贡献, 进而以其作为拓扑权值, 提出一种基于能量代价的最小权和连通支配集拓扑控制算法。算法选取局部最小权值节点担负支配任务, 搭建整体权和最小的支配集, 最小化网络整体能耗。实验结果表明, 算法不仅具有节能的特点, 还确保了通信链路的可靠性, 有效延长了网络生命周期。

关键词 [无线传感器网络](#) [拓扑控制](#) [能量代价](#) [最小权和连通支配集](#)

分类号 [TP393](#)

Energy Cost Based Topology Control Algorithm of Minimum-Total-Weight Connected Dominating Set in WSNs

Sun Chao, Yin Rong-rong, Hao Xiao-chen, Liu Bin

Institute of Information Technology and Engineering, Yanshan University, Qinhuangdao 066004, China

Abstract

In this paper, defining energy cost function constructed by remain energy, neighborhood numbers and communication cost of nodes as topology weight to synthetically reflect the energy efficiency of dominator and the contribution of reduced whole energy consumption, an Energy Cost based topology control algorithm for Minimum-total-weight Connected Dominating Set (ECMCDS) is proposed to solve the problem that the energy consumption of minimum connected dominating set is not minimum. The algorithm locally selects the node with a low-weight undertaking dominating mission to construct minimum-total-weight dominating set, and minimums the total energy consumption of networks. The experimental results show that the algorithm not only has the energy saved characters, but also ensures the reliability of topology links and extends the network life-cycle efficiently.

Key words [Wireless sensor network](#) [Topology control](#) [Energy cost](#) [Minimum-total-weight connected dominating set](#)

DOI: 10.3724/SP.J.1146.2009.00342

通讯作者 孙超 sch723@163.com

作者个人主页 孙超; 尹荣荣; 郝晓辰; 刘彬

扩展功能	
本文信息	
▶	Supporting info
▶	PDF (279KB)
▶	[HTML全文](OKB)
▶	参考文献[PDF]
▶	参考文献
服务与反馈	
▶	把本文推荐给朋友
▶	加入我的书架
▶	加入引用管理器
▶	复制索引
▶	Email Alert
▶	文章反馈
▶	浏览反馈信息
相关信息	
▶	本刊中 包含“无线传感器网络”的相关文章
▶	本文作者相关文章
·	孙超
·	尹荣荣
·	郝晓辰
·	刘彬