无线传感网络中能量均衡的连通支配集算法

作　者：付永生, 李善平, 周波

单　位：浙江大学计算机学院

摘　要：

连通支配集是无线传感器网络中构建虚拟骨干网络的重要手段。由于支配集中节点的能耗相对其他节点要多，支配集中剩余能量较小的节点决定了虚拟骨干网的生命周期。现有算法或者只是关注构造较小的支配集，或者没有考虑调整能耗极快的支配节点。本文提出了一种能量均衡的连通支配集算法，基于节点剩余能量和连通度构造支配集，在网络运行过程中根据耗能速度，提前选择候选支配节点，分流负载过重的支配节点。仿真结果表明，新算法能以较小消息开销，有效延长网络寿命。

关键词：无线传感网络；连通支配集；连通度；能量均衡

An Energy-Balance Connected Dominating Set Algorithm in Wireless Sensor Networks

Author's Name:

Institution:

Abstract:

Connected Dominating Set (CDS) is an important technique to construct the virtual backbone network in wireless sensor networks. Since the dominating nodes consume more energy than non-dominating nodes, the lifetime of virtual backbone network depends on the dominating nodes with less left energy. The existing CDS algorithms focus on finding minimum size CDS and ignore the dominating nodes with fast speed of energy consumption in real scenarios. An Energy-Balance Connected Dominating Set (EB-CDS) algorithm is proposed in this paper. EB-CDS constructs CDS based on the left energy and connectivity degree. The dominating node with fast energy consumption speed selects dominator candidates and splits the routing load. The simulation results show that EB-CDS keeps the energy balance with small message overhead and effectively prolongs the network lifetime.

Keywords: wireless sensor networks; connected dominating set; connectivity degree; energy balance

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