

基于点割集的无线带状传感网分布式寿命预测算法

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A Distributed Vertex Cut-set Based Algorithm for Network Lifetime Estimation in Strip-based Wireless Sensor Networks

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摘要

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摘要 无线带状传感网是一种典型传感网应用模式, 现有的网络生存时间模型大多面向特定的布设模型和工作模式, 不能直接应用于带状传感网寿命预测。该文提出一种基于点割集的带状网分布式寿命预测算法。该算法仅利用邻居节点的位置和剩余生存时间等局部信息求解点割集及局部网络生存时间, 通过相邻节点间交互包含局部网络生存时间的信令, 估计整个网络的剩余生存时间。仿真结果表明, 与现有基于梯度的网络生命估计算法相比, 该文算法能准确且实时地估计网络的生存时间。

关键词: 无线带状传感网 生存时间 点割集

Abstract: Strip-based wireless sensor network is a typical application of wireless sensor network (WSN). Existent the network lifetime model is primarily focused on specific distribution and working model, which can not be applied to the lifetime estimation in strip-based WSN directly. This paper proposes a distributed vertex cut-set computing algorithm to forecast the lifetime of a strip-based WSN. According to this algorithm, each node only computes a near-minimum vertex cut-set and its local residual lifetime with the assistance of position information and residual lifetime information of neighboring nodes, and then exchange signaling messages carrying such local estimated residual lifetime for computing the residual lifetime of the whole network. Simulation results show that, compared to previous gradient-based lifetime estimating algorithm, the proposed algorithm can estimate the network lifetime in real-time and also more accurately.

Keywords: Strip-based wireless sensor network Lifetime Vertex cut-set

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