基于最优线性拟合的WSN时间同步算法研究

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摘 要：

针对传感器网络应用对节点同步精度要求高、通信开销小等需求，在分析FTSP算法的基础上，提出了一种基于最优线性拟合的时间同步算法。通过节点分级策略，减少同步分组数据传输量，并引入概率统计学中参数估计理论改进线性回归算法，减小了异常数据点对同步精度的影响，延长了节点同步时间。实验结果表明：该算法能有效减少同步通信开销，实现高精度的时间同步，同步误差在μ s级。

关键词：无线传感器网络，时间同步，FTSP泛洪时间同步协议，参数估计

Study on Optimal Linear Fit Time Synchronization Algorithm for Wireless Sensor Network

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Abstract:

To satisfy the requirements of high synchronization precision and low communication costs among node's, a new synchronization algorithm based on optimal linear fit is proposed after analysis of FTSP algorithm. Firstly, node classifying strategy is adopted to reduce the transition amounts of synchronization packet data, then, parameter estimating theory of probability and statistics is introduced to improve linear regression algorithm, and the influence of abnormal data to synchronization precision is reduced and node synchronization time is extended. Experiments have shown that this new algorithm can effectively reduce the synchronization costs and realize high synchronization precision with μ s level errors.

Keywords: Wireless sensor network, Time synchronization, FTSP, Parameter estimation

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