

### 基于最优阶估计与分布式分簇的传感器网络数据压缩方法研究

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## Research on Data Compression Algorithm for Wireless Sensor Networks Based on Optimal Order Estimation and Distributed Clustering

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摘要

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摘要 在无线传感器网络的诸多应用中,被监测区域发生异常情况的概率通常较小,正常情况下,同一传感器节点在前后连续时刻所采集的数据具有时间相关性,处于相邻区域的不同传感器节点在同一时刻所采集的数据具有空间相关性,发送存在时间、空间冗余的数据至基站必将耗费节点大量的能量。该文提出了基于最优阶估计和分布式分簇的传感器网络数据压缩方法,利用节点采集数据的时空相关性,基于最优阶估计在基站处建立相关系数,经分布式分簇,节点仅需传送少量数据,基站根据时空相关性恢复原始数据。仿真结果表明应用该算法,可以有效减少传感器网络中冗余数据传输量和节点能耗,进而延长系统寿命。

关键词: 无线传感器网络 数据压缩 最优阶估计 分布式分簇

Abstract: The possibility of occurring exception is relatively small in most applications of wireless sensor networks. So data obtained in sequent moment by the same node have time correlation, and data obtained in the same time by adjacent nodes have space correlation. A large number of energy of node will be wasted if data which include time and space correlation is transmitted. Therefore, this paper proposed a data compression algorithm for wireless sensor networks based on optimal order estimation and distributed clustering. The algorithm explores the time and space correlation among data obtained by sensors. The correlation parameter can be get based on optimal order estimation. Then all data can be restored based on time and space correlation parameters and only a little necessary data are transmitted by nodes. Because redundancy is decreased when data is transmitted, the average energy cost of node is reduced and the life of the whole wireless sensor networks can be extended.

Keywords: Wireless sensor networks Data compression Optional order estimation Distributed clustering

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