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基于能量均衡的无线传感器网络压缩感知算法

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Energy Balance Based WSN Compressive Sensing Algorithm

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摘要 无线传感器网络在探测目标源时会碰到处理能力不足和能量缺乏的问题。为了克服这些问题，该文提出了基于能量均衡的自适应压缩感知算法。与传统自适应压缩感知算法不同，所提出的算法在选择观测向量时不仅考虑了重构性能，还考虑了节点的能量均衡，防止某些节点过快消耗能量而导致整体网络结构的破坏。同时为了适应不同应用场景的需求，将自适应压缩感知算法和能量均衡压缩感知算法相结合，通过门限值的选择达到灵活配置的目的。仿真实验的结果表明，该文所提出的算法能够有效延长网络生存时间，同时能够实现能耗和收敛性的兼顾。

关键词： 无线传感器网络 自适应压缩感知算法 能量均衡 门限

Abstract： Source detection of Wireless Sensor Network (WSN) would encounter problems of lacks of processing power and energy. To overcome these problems, an adaptive compressive sensing algorithm based on energy balance is proposed. Unlike the traditional adaptive compressive sensing algorithms, the proposed algorithm not only takes into account the reconstruction performance, but also considers the energy balance of the nodes when chooses the measurement vector. It prevents some nodes from the excessive consumption of energy and leading to the destruction of the whole network structure. At the same time in order to meet the needs of different application scenarios, the adaptive compressive sensing algorithm is combined with the energy balance based compressive sensing algorithm, and flexible configuration purpose is achieved by choosing the threshold. The simulations show that the proposed algorithm can extend the survival time of the network and consider both the energy consumption and convergence.

Keywords： Wireless Sensor Network (WSN) Adaptive compressive sensing algorithm Energy balance Threshold

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