基于邻里支持和神经网络的 WSN 数据融合算法研究

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摘 要：为了提高无线传感器网络（wireless sensor network, WSN）的可靠性、稳健性、减少错误及冗余信息的传输,提出了一种基于邻里支持度的动态分簇 BP（Back Propagation）神经网络数据融合算法 (Neighborhood-SupportBack-Propagation NetworksData Aggregation,NBNDA).其中动态分簇以及簇首的选择基于邻里支持度的大小以及节点的剩余能量等.同时，为了减少 WSN 中的通信量，在簇首处使用三层神经网络进行监测数据的特征提取，然后将特征值发送至汇聚节点.仿真实验表明，与 LEACH 协议相比，本文算法不仅能够提高 WSN 的可靠性和稳健性，又能减少数据冗余，延长网络寿命.

关键词：无线传感器网络；数据融合；邻里支持度；BP 神经网络

Data aggregation of WSN based on neighborhood support and BP neural network

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Abstract：To improve wireless sensor network (WSN) reliability、robustness and reduce error and redundant information transmission. A dynamic clustering BP neural network Data Aggregation algorithm based on neighborhood support is proposed. The dynamic clustering and the selection of cluster head are based on the state of the node, the neighborhood support and the residual energy of the node. At the same time, in order to reduce communications in WSN, the cluster head uses three-layer neural network for feature extraction of monitoring data, and then sends the feature value to the sink node. Simulation results show that this algorithm can not only improve the reliability and robustness of WSN, but also reduce data redundancy and extend the network life compared with the classic clustering protocol LEACH.

Key words：WSN; data aggregation; neighborhood support; BP neural network

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