基于加权分簇的移动无线传感器网络拓扑维护算法

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摘要： 针对移动无线传感器网络(mobile wireless sensor networks,MWSN)，本文提出了一种基于加权分簇的拓扑维护算法(Weighted clustering based topology maintenance algorithm,WCTMA)，该算法首先基于节点的移动性和剩余能量计算节点的权重值并对网络进行分簇；然后利用节点间控制消息的发送和接收来判断网络拓扑是否发生变化；最后根据引起网络拓扑发生变化的不同因素，具体设计了簇内和簇间的拓扑维护策略.仿真结果表明，WCTMA 算法与 FDRC 算法在节点的平均剩余能量、网络的连通度、网络的生命周期等性能方面具有显著改善.

关键词： 移动无线传感器网络；拓扑维护；加权分簇；节点的移动性；剩余能量；节点的权重值

Weighted Clustering Based on Topology Maintenance Algorithm of Mobile Wireless Sensor Networks

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Abstract： To deal wth the problems of network topology change caused by node mobility, new nodes joining network, and node failure that impacted on network performance in mobile wireless sensor networks (MWSN). Weighted clustering based topology maintenance algorithm (WCTMA) was proposed in this paper.Firstly, the nodes'weights were calculated based on the mobility and surplus energy, the network was clustered according to the nodes'weights.Secondly, the control messages of transmission and reception between nodes was used to judge whether the network topology has changed.Finally, cluster topology maintenance strategy and inter-cluster topology maintenance strategy were designed according to the different factors that cause the network topology change.The simulation results show that the WCTMA algorithm has significantly improved compare with FDRC algorithm in average node residual energy, network connectivity degree and lifetime of network.

Key words： MWSN; topology maintenance; weighted clustering; the mobility of the nodes

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