农田信息采集单多跳共存LEACH算法 Improved LEACH Algorithm with Coexistence of Single-hop and Multi-hop Based on the Farm Fields

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关键词： 农田信息采集 无线传感器网络 LEACH算法

摘 要： 针对农田环境信息量丰富的特点，提出一种基于LEACH算法的改进型无线传感器网络路由算法——LEACH-SMC。在LEACH-SMC算法的稳态阶段，簇头节点到基站间通信采用临界距离来判断和选择多跳或单跳方式，在多跳方式中采用基于最小能量消耗的路由方式。应用Matlab对LEACH-SMC算法和LEACH算法进行仿真对比分析，结果表明，LEACH-SMC算法能提高网络有效覆盖面积并延长整个网络的寿命。 An improvement of LEACH algorithm was proposed, named LEACH-SMC. The LEACH-SMC protocol algorithm was carried out round by round, and every round was divided into two sections of setup phase and steady station. A critical distance was specified for every cluster head to judge when to use the single-hop or the multi-hop mode between the cluster heads and the base station. The coverage area was greatly improved by the multi-hop manner, and this manner also provided practical value in the nodes distribution in the farm field. It was effective for transmitting the message by single-hop mode, and it could greatly reduce the information delay and packet loss rate too. The coexistence of single-hop and multi-hop can combine the advantages. Simulation results demonstrated that LEACH-SMC protocol could increase network effective coverage area and prolong the network lifetime.

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