

改进引力搜索算法的分环路由协议

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摘 要: 针对无线传感器网络分簇不合理、路径寻优性能不佳等问题, 提出了改进引力搜索算法的分环路由协议(IGSAR). 首先对节点覆盖的区域进行分环, 并给出各环内每个簇的成员节点数, 节点通过记录接收的邻居节点信号个数, 达到设定值后宣布成簇, 然后在簇内选举簇头; 簇间路由采用引力搜索算法寻找最优路径, 同时引入动态权重优化搜索算法, 以多跳的方式将数据传输到汇聚节点. 仿真结果证明: IGSAR 协议在簇头能耗的均衡性和节点能量的利用方面均优于 EEUC 协议、RCANND 协议.

关键词: 无线传感器网络; 动态权重; 引力搜索算法; 分环; 路由协议

Improved gravitational search algorithm for ring routing protocol

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Abstract: Aiming at the problems of unreasonable clustering and poor path searching performance in wireless sensor networks, a Improved Gravitational Search Algorithm for Ring routing protocol was proposed(IGSAR). Firstly, the area covered by nodes is divided into rings, and the number of members of each cluster in each ring is given. By recording the number of signals received by neighbor nodes, the nodes announce clustering after reaching the set value, and then elect cluster heads within the cluster. In the inter-cluster routing, gravity search algorithm is adopted to find the optimal path, and dynamic weight optimization search algorithm is introduced to transmit data to the sink node in the way of multiple hops. Simulation results show that IGSAR is better than LEACH and EEUC in energy balance and energy balance of cluster head and energy utilization of nodes.

Key words: wireless sensor network; dynamic weight; gravity search algorithm; sub-ring; routing protocol

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