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基于区域不相交策略的无线传感器网络任播路由算法

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摘　要：

任播技术应用在无线传感器网络(WSN)中可以均衡数据流和能耗。以往算法在寻找任播路径时多采用路径或节点不相交路由策略，该策略无法解决因隐终端问题造成的传递碰撞问题，导致额外的大量重传能耗。针对以上问题，提出一种基于区域不相交策略的WSN任播路由算法(ZDAR)，该算法根据各路径的邻居节点影响因子(邻居节点参与其他任播路径的度)依次选择无传递碰撞问题的任播路径，相比较最短路径优先选择策略，ZDAR算法能够寻找到更多数量的区域不相交任播路径。仿真结果表明证明相比较节点不相交路由策略和最短路径优先区域不相交路由策略，ZDAR算法的系统能耗和能耗均衡的综合指标具有较好的性能优势，从而提高网络生存期

关键词：无线传感器网络；任播；区域不相交；路由算法

Anycast Routing Algorithm for Wireless Sensor Networks Based on Zone-Disjoint Scheme

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Abstract:

Anycast technique can significantly balance data flow and energy consumption in Wireless Sensor Networks(WSN). Most previous research works adopt path-disjoint or node-disjoint scheme to search anycast paths, but it cannot solve the transmission collision problem caused by the hidden terminal problem, thus bring much extra retransmission energy consumption. For this problem, an anycast routing algorithm for WSN based on zone-disjoint scheme is proposed(ZDAR). In the algorithm, we select anycast paths one by one in order of their neighbor nodes' impact factors(the degree that the neighbor nodes participate in other anycast paths) and ensure that the paths will not collide with each other, in contrast to zone-disjoint routing algorithms based on shortest path first(SPF) scheme, ZDAR algorithm can find more zone-disjoint anycast paths. In comparison with node-disjoint scheme and zone-disjoint routing scheme based on SPF, simulation results show that the performance of ZDAR algorithm is better in term of the composite indicator about both total energy consumption and energy balance, thus improving the network lifetime.

Keywords: wireless sensor networks; anycast; zone-disjoint; routing algorithm

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