基于空洞模型的地理位置路由改进算法研究

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摘 要：

针对现有WSN中地理位置路由遇路由空洞后会产生冗余路由的问题，提出一种基于感知空洞形状的分段贪婪路由（Easy Modeling Greedy Routing，EMGR）算法。EMGR引入虚拟坐标概念，利用空洞边界探测包收集空洞边界节点信息，将其映射到虚拟坐标系中；根据空洞边界节点在虚拟坐标系的不同分布，定义凹、凸域来概括路由空洞形状；根据不同的空洞形状找到合适的中转节点，采用分段贪婪路由方式传输数据。仿真实验结果表明，相较于GPSR算法，EMGR算法产生的路由跳数减少了35%，网络能耗低，路径扩张率和网络时延小。

关键词：无线传感器网络，路由空洞，虚拟坐标，分段贪婪

An Improved Geographic Routing Algorithm Based on Hole Modeling

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Abstract:

In current Geographic routing protocols for wireless sensor networks, redundant routing paths will be produced when routing holes are encountered. This paper presents an improved segmented greedy routing algorithm called EMGR (Easy Modeling Greedy Routing). Firstly, this algorithm introduces the virtual coordinate conception, uses Holes Boundary Detection (HBD) packet to find out all nodes on the boundary of the hole, then maps these nodes to virtual coordinate. According to the different distribution of hole boundary nodes in the virtual coordinate, it defines concave domain and convex domain to describe the shape of different holes, then finds the appropriate relay node according to the different shape of the holes. At last it uses the segmented greedy routing mode to transmit data packets. Compared to GPSR algorithm, simulation results show that EMGR algorithm could reduce 35% path hops with less network energy consumption, decrease routing path expansion rate and shorten network delay.

Keywords: wireless sensor networks; routing holes; virtual coordinate; segmented greedy forwarding

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