

自动化

基于长链树状无线传感器网络实现输电线路在线监测数据传输

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摘要:

为解决用于输电线路监测的长链树状ZigBee无线传感器网络中汇聚(Sink)节点附近的漏斗效应问题, 提出一种基于地理位置的多Sink节点协作机制, 采用多个邻近部署网络的Sink节点协作传输来解决网络瓶颈问题; 在此基础上, 采用信道调整以控制节点度的方法来解决因提升传感器节点发射功率所带来的节点间信道竞争激烈和数据传输时延大等问题。对所提出的方法进行了分析和实验仿真, 结果证明该方法很好地解决了Sink节点的漏斗效应, 并且获得了良好的实时性。

关键词: 无线传感器网络 输电线路监测 实时性 负载平衡 服务质量

Transmission of Power Line On-Line Monitoring Data Based on Long-Chain Tree-Like Wireless Sensor Network

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Abstract:

To solve the funnel effect near the Sink nodes in long-chain tree-like ZigBee wireless sensor network (WSN) used for transmission line monitoring and warning system, a multi Sink cooperation mechanism based on geographical position is proposed, and the network bottleneck problem is solved by cooperation transmission of Sink nodes in multi adjacently deployed networks; on this basis, to solve the problems of intense competition of channels being contained within nodes and long time-delay of data transmission brought by raising the transmitting power of sensor nodes, a method of adjusting channel to control the node degree is adopted. Analysis and experiment simulation for the proposed method are performed, and the results show that the proposed method possesses favorable real-time performance and can solve the funnel effect due to Sink nodes well.

Keywords: wireless sensor networks (WSN) power transmission line monitoring real-time performance load balance quality of service

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