

基于移动Agent和WSN的突发事件场景数据收集算法研究

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Data Gathering Algorithm Based on Mobile Agent and WSN for Emergent Event Monitoring

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摘要

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摘要 该文针对无线传感器网络应用于突发事件监测场景的能量消耗和网络延迟问题,提出了基于移动Agent的无线传感器网络簇式数据收集算法。动态成簇过程基于事件严重程度,并由其决定簇的生命周期和覆盖范围。Sink和簇头之间形成以Sink节点为簇头的虚拟簇。移动Agent迁移路径规划过程中下一跳节点的选取基于节点剩余能量、路径损耗及受刺激强度。移动Agent通过节点遍历的方式完成对所有簇内成员节点信息的收集。仿真结果表明,相对于C/S数据收集模型,基于移动Agent的模型具有更好的节能效果,并能一定程度地减少网络延迟,尤其适用于大规模无线传感器网络应用。

关键词: 无线传感器网络 移动Agent 数据收集 分簇 突发事件监测

Abstract: Focusing on the energy consumption and the network delay in wireless sensor network applied to emergent event monitoring, a new Data Gathering algorithm based on Mobile Agent (DGMA) is proposed for the chain-based wireless sensor network. The process of dynamically clustering the sensor nodes is based on the event severity, by which the scale and lifetime of clusters are determined. And a virtual cluster is formed between sink and cluster heads regarded sink node as its cluster head. The next hop in route planning for mobile agents is determined by the residual energy, the path loss and the stimulus intensity. The mobile agents equipped on cluster heads can gather information by traversing all member nodes. The theory analysis and simulation results show that mobile agent model has a better performance in energy consumption and network delay compared to C/S model. Furthermore, DGMA will provide a more appropriate performance for wireless sensor network applied to a large scale emergent event monitoring.

Keywords: Wireless Sensor Network (WSN) Mobile Agent Data Gathering Cluster-based Emergent event monitoring

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