基于移动Agent的无线多媒体传感器网络QoS路由算法

作　者：李致远, 毕俊蕾, 王钕川

单　位：江苏大学计算机科学与通信工程学院

基金项目：基于零知识的移动对等资源动态安全共享技术研究，面向物联网的混合式无线传感网容侵结构及关键技术研究

摘　要：

无线多媒体传感器网络(WMSNs)的主要特点包括资源有限、时延敏感和数据冗余性高。此外，音视频数据流传输所需的带宽是多媒体传感器节点所能承受的最大传输带宽的几倍。上述因素使得WMSNs的QoS 路由成为一个亟待解决的关键技术问题。鉴于此，首先通过基于等差数列的非均匀分簇算法对网络区域进行划分，然后在此网络拓扑上，提出一种基于移动Agent的WMSNs的QoS路由算法(MAQR)。MAQR由路由发现和数据传输两个阶段组成。在路由发现阶段，采用移动代理技术完成多路径路由发现。在数据传输阶段，采用多优先级多路径传输模型把数据流进行分类，并利用流量预测算法实现网络的负载均衡。最后，在NS-2平台上实现了MAQR，通过与同类算法进行仿真比较，发现MAQR较之同类算法能够明显地提高音视频传输的服务质量。此外，MAQR算法比同类算法的能耗更低。

关键词：无线多媒体传感器网络；QoS路由算法；非均匀分簇；移动代理

A QoS Routing Algorithm Based on Mobile Agent for Wireless Multimedia Sensor Networks

Author's Name:

Institution:

Abstract:

The main characteristics of wireless multimedia sensor networks(WMSNs) include limited energy resources, delay-sensitive and high data redundancy. Besides, the bandwidth for the audio and video streams transmission is several times than the maximum transmission bandwidth of the multimedia sensors. The two aspects make the quality of service(QoS) routing of WMSNs become a greatly challenging issue. Firstly, the network area is divided via an uneven clustering algorithm based on arithmetic progression. Then a mobile agent-based QoS routing algorithm for WMSNs (MAQR) under the uneven network topology is proposed. MAQR consists of a multipath routing discovery phase and a data transmission phase. In the multipath routing discovery phase, the mobile agent technology is used to implement the multipath routing discovery. In the data transmission phase, the proposed multi-priority multi-path transmission model is used to classify the data flow, and the proposed traffic prediction model is used to achieve load balancing of the WMSNs. Finally, MAQR is implemented on the platform of NS-2. The simulation results show that MAQR can significantly improve the quality of services of multimedia stream transmission and have lower energy consumption compared with the similar algorithms.

Keywords: wireless multimedia sensor networks; QoS routing; unequal clustering; mobile agent

投稿时间：**2013-02-20**

查看pdf文件