

衰落信道下基于非合作博弈的Ad hoc协作并行传输方案

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Non-cooperative Game-based Cooperative Concurrent Transmission under Fading Channels in Ad hoc Networks

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摘要

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摘要 该文针对Ad hoc网络中同时存在的快、慢衰落情况,提出一种依据节点信号干扰噪声比(Signal to Interference plus Noise Ratio, SINR)计算并行传输门限的方法。该方法在获知节点信道质量的分布情况后,采用贝叶斯非合作博弈理论对不同源目的节点对之间的并行传输进行建模。考虑到该模型会使信道质量长时间低于并行传输门限的节点处于发送“饥饿”状态,该文引入协作通信机制来解决“饥饿”节点的并行传输问题,且与已存在的源目的节点通信对并存。仿真结果显示,该文提出的CTCG (Concurrent Transmission based on Channel quality with Game theory aid)模型能较大幅度增加Ad hoc网络的并行传输机会,提高系统吞吐量,且能够较好的解决“饥饿”节点的发送抑制问题。

关键词: 无线自组织网络 博弈论 并行传输 衰落信道

Abstract: A concurrent transmission scheme is proposed in this paper based on nodal SINR (Signal to Interference plus Noise Ratio) under fast and slow fading coexistence channel in Ad hoc networks. Based on the distribution of channel quality, a concurrent transmission model is given between different sources and destinations with non-cooperative game theory and Bayesian Nash Equilibrium. Then the relay mechanism is proposed to increase the concurrent transmission opportunity for hunger nodes whose channel qualities are under concurrent transmission threshold for a long time. Simulation results show that the proposed CTCG (Concurrent Transmission based on Channel quality with Game theory aid) model can greatly increase the chance of concurrent transmission, improve the system throughput and handle the hunger nodes transmission problems in Ad hoc networks.

Keywords: Ad hoc networks Game theory Concurrent transmission Fading channels

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