论文

相继干扰消除的无线自组网基于SINR模型的调度

吕绍和,王晓东,周兴铭

（并行与分布处理国防科技重点实验室， 湖南 长沙 410073）

摘要：

干扰是限制现代无线网络性能的关键因素。相继干扰消除(SIC)是一种简单而强大的多包接收技术，它可在物理层有效地处理干扰。本文研究了支持SIC的Ad Hoc网络中基于累积干扰模型的链路调度。干扰的累积效应与SIC的顺序解码特性相互作用，给干扰刻画与链路调度带来了重要的技术挑战。为刻画多条链路的干扰的累积，对任意链路，定义冲突集以表示一组能干扰它的解码。然后提出冲突集图(CSG)以刻画网络的干扰并定义干扰度以衡量链路的干扰。由于基于CSG的调度为NP hard问题，设计了基于独立集的贪婪算法以有效地构造近似最优的可行调度。仿真实验表明，与简单的贪婪算法相比［1］，本算法吞吐量平均提高30%且最高达60%。

关键词： 链路调度 相继干扰消除 基于SINR的累积干扰模型

Scheduling under the SINR Model in Ad Hoc Networks with Successive Interference Cancellation

Lv Shao he,WANG Xiao dong,ZHOU Xing ming

（National Laboratory for Parallel and Distributed Processing，Changsha 410073,China）

Abstract:

The capacity of modern wireless communication systems is limited by interference. Successive Interference Cancellation (SIC) is an effective way of multipacket reception to combat interference at the physical layer. This paper focuses on link scheduling under the SINR (Signal to Interference Noise Ratio) model in an Ad Hoc network with SIC. The facts that interference is accumulated and that the links decoded sequentially by SIC are bring about key technical challenges. To characterize the accumulative effect, for a given link, conflict set is defined as a set of links that can interfere with the detection at the link. And then, we propose a conflict set graph (CSG) to characterize the interference and define interference degree to measure the link interference. As scheduling over CSG is NP hard, an independent set based greedy scheme is explored to efficiently construct a maximal feasible schedule. The performance is evaluated by simulations. As compared to the simple greedy method ［1］, the throughput gain is on average 30% and up to 60%.

Keywords: link scheduling;successive interference cancellation;SINR based interference model

通讯作者：

作者简介：

作者Email：

参考文献：

本刊中的类似文章

1．王媛丽[1] 刘湘辉[1,2] 殷建平[1] 景宁[2].基于干扰模式的无线传感器网络链路调度算法[J]. 计算机工程与科学, 2007,29(9): 94-96

1．王媛丽[1] 刘湘辉[1,2] 殷建平[1] 景宁[2].基于干扰模式的无线传感器网络链路调度算法[J]. 计算机工程与科学, 2007,29(9): 94-96