

## 运筹学与信息科学研究所

Department of Operations Research and Information Science

# 学术报告

**题目：** Cost Allocation for NonCooperative Joint Replenishment Game

**报告人：** 罗俊杰，北京交通大学数学与统计学院

**时间：** 11月22日（星期五） 19:00 – 20:00

**地点：** 数学院南楼 N224

**摘要：** We study the infinite-horizon deterministic joint replenishment model from a noncooperative game-theoretical approach. In this model, a group of retailers can choose to jointly place an order, which incurs a major setup cost independent of the group, and a minor setup cost for each retailer. Additionally, each retailer is associated with a holding cost. Our goal is to design cost allocation rules that minimize the long-run average system cost, given that each retailer can determine their replenishment interval to minimize their own cost. We study a class of rules that allocate each major setup cost to the associated retailers in proportion to their predefined weights. For these rules, we establish a monotonicity property of agent better responses and show the existence of a payoff dominant pure Nash equilibrium, which an efficient algorithm can find. We then provide a comprehensive analysis of the price of stability (PoS), the ratio between the system cost of the best Nash equilibrium and the social optimum, for two natural rules from this class. The first rule achieves a PoS of 1.25 by utilizing retailers' holding cost rates, while the second rule maintains a small PoS and does not require retailers' private information.

**报告人简介：** 罗俊杰，北京交通大学数学与统计学院讲师，硕导，CCF理论计算机科学专委会执行委员，CCF计算经济学专业组执行委员。2014年本科毕业于浙江大学数学系，2019年博士毕业于中国科学院数学与系统科学研究院，之后分别在德国柏林工业大学和新加坡南洋理工大学担任博士后研究员。主要研究方向为组合优化、算法博弈论，论文发表在 Information and Computation、Algorithmica、JAIR、WINE、AAAI、IJCAI 等期刊与会议上。