中国科学院数学与系统科学研究院 Academy of Mathematics and Systems Science, CAS

## 图论组合与网络研究中心

**Center for Graph Theory, Combinatorics and Networks** 



- 题目: MMS Allocation of Indivisible Chores with Subadditive Valuations and the Fair Surveillance Assignment Problem
- 报告人: 李博 助理教授, 香港理工大学
- 时 间: 12月31日(星期二) 下午 17:00 18:00
- 地 点: 数学院南楼 224

要: We study the maximin share (MMS) fair allocation of m摘 indivisible chores to n agents who have costs for completing the assigned chores. It is known that exact MMS fairness cannot be guaranteed, and so far the best-known approximation for additive cost functions is 13/11 by Huang and Segal-Halevi [EC, 2023]; however, beyond additivity, very little is known. In this work, we first prove that no algorithm can ensure better than  $\min\{n, \log m / \log \log m\}$ -approximation if the cost functions are submodular. This result also shows a sharp contrast with the allocation of goods where constant approximations exist as shown by Barman and Krishnamurthy [TEAC, 2020] and Ghodsi et al. [AIJ, 2022]. We then prove that for subadditive costs, there always exists an allocation that is  $\min\{n, \lceil \log m \rceil\}$ approximation, and thus the approximation ratio is asymptotically tight. Due to the hardness result for general subadditive costs, we turn to study specific subadditive costs, e.g., vertex cover, which is called the fair surveillance assignment problem, and more. For these settings, we show that constant approximate allocations exist.

个人简介: Bo Li is an assistant professor in the Department of Computing at The Hong Kong Polytechnic University. Formerly, he was a Postdoctoral Fellow at the University of Oxford and the University of Texas at Austin. He received his Ph.D. in Computer Science from Stony Brook University and B.S. in Applied Maths from Ocean University of China. He is broadly interested in algorithms, AI, and game theory.