XINHANG LU

CONTACT INFORMATION

CSE (K17), UNSW Sydney
Kensington NSW 2052, Australia

xinhang.lu@unsw.edu.au
LUXINHANG.COM

RESEARCH INTERESTS

I am broadly interested in problems at the interface between computer science and economics. Recently, my work has focused on resource allocation and mechanism design.

EDUCATION

Ph.D. in Mathematical Sciences July 2017 – September 2021
Nanyang Technological University Singapore
- Thesis: *Fair Resource Allocation in Rich Domains*
- Supervisor: Xiaohui Bei

B.Eng. in Computer Science and Technology August 2013 – June 2017
Southeast University Nanjing, China
- Final Year Project: *Causal Explanation with Bayesian Networks*
- Advisers: Kevin B. Korb (Monash), Erik P. Nyberg (Monash), and Weiwei Wu

APPOINTMENTS

School of Computer Science and Engineering, The University of New South Wales Sydney, Australia
Postdoctoral Fellow December 2021 – Present
- Host: Toby Walsh

Department of Computer Science, National University of Singapore Singapore
Research Fellow September 2021 – November 2021
- Host: Warut Suksompong

SURVEY

- **Mixed Fair Division: A Survey**.
  Shengxin Liu, Xinhang Lu, Mashbat Suzuki, and Toby Walsh.
  Manuscript, 2023. Preprint available at https://arxiv.org/abs/2306.09564

CONFERENCE PROCEEDINGS

C1. **Fair Division with Subjective Divisibility**.
Xiaohui Bei, Shengxin Liu, and Xinhang Lu.
In *Proceedings of the 19th Conference on Web and Internet Economics (WINE)*, December 2023. Forthcoming

C2. **Best-of-Both-Worlds Fairness in Committee Voting**.
Haris Aziz, Xinhang Lu, Mashbat Suzuki, Jeremy Vollen, and Toby Walsh.
In *Proceedings of the 19th Conference on Web and Internet Economics (WINE)*, December 2023. Forthcoming. Preprint available at https://arxiv.org/abs/2303.03642

C3. **Truthful Fair Mechanisms for Allocating Mixed Divisible and Indivisible Goods**.
Zihao Li, Shengxin Liu, Xinhang Lu, and Biaoshuai Tao.
In *Proceedings of the 32nd International Joint Conference on Artificial Intelligence (IJCAI)*, pages 2808–2816, August 2023. doi:10.24963/ijcai.2023/313

C4. **Approval-Based Voting with Mixed Goods**.
Xinhang Lu, Jannik Peters, Haris Aziz, Xiaohui Bei, and Warut Suksompong.
In *Proceedings of the 37th AAAI Conference on Artificial Intelligence (AAAI)*, pages 5781–5788, February 2023. doi:10.1609/aaai.v37i5.25717

C5. **Truthful Cake Sharing**.
Xiaohui Bei, Xinhang Lu, and Warut Suksompong.
In *Proceedings of the 36th AAAI Conference on Artificial Intelligence (AAAI)*, pages 4809–4817, February–March 2022. doi:10.1609/aaai.v36i5.20408

C6. **The Price of Connectivity in Fair Division**.
Xiaohui Bei, Ayumi Igarashi, Xinhang Lu, and Warut Suksompong.

In *Proceedings of the 35th AAAI Conference on Artificial Intelligence (AAAI)*, pages 5151–5158, February 2021. doi:10.1609/aaai.v35i6.16651. Journal version in *SIAM Journal on Discrete Mathematics (SIDMA)* (J1)

C7. **Maximin Fairness with Mixed Divisible and Indivisible Goods**.
Xiaohui Bei, Shengxin Liu, Xinhang Lu, and Hongao Wang.
In *Proceedings of the 35th AAAI Conference on Artificial Intelligence (AAAI)*, pages 5167–5175, February 2021. doi:10.1609/aaai.v35i6.16653. Journal version in *Autonomous Agents and Multi-Agent Systems (JAAMAS)* (J4)

C8. **Fair Division of Mixed Divisible and Indivisible Goods**.
Xiaohui Bei, Zihao Li, Jinyan Liu, Shengxin Liu, and Xinhang Lu.
In *Proceedings of the 34th AAAI Conference on Artificial Intelligence (AAAI)*, pages 1814–1821, February 2020. doi:10.1609/aaai.v34i02.5548. Invited for publication in *Artificial Intelligence (AIJ)* through the fast track scheme (J5)
AAAI-20 Outstanding Student Paper Award

C9. **The Price of Fairness for Indivisible Goods**.
Xiaohui Bei, Xinhang Lu, Pasin Manurangsi, and Warut Suksompong.
In *Proceedings of the 28th International Joint Conference on Artificial Intelligence (IJCAI)*, pages 81–87, August 2019. doi:10.24963/ijcai.2019/12. Journal version in *Theory of Computing Systems (TOCS)* (J3)

Journal Articles

J1. **The Price of Connectivity in Fair Division**.
Xiaohui Bei, Ayumi Igarashi, Xinhang Lu, and Warut Suksompong.
SIAM Journal on Discrete Mathematics (SIDMA), 36(2):1156–1186, 2022. doi:10.1137/20M1388310. Preliminary version in AAAI-21 (C6)

J2. **Throughput Maximization in Wireless Communication Systems Powered by Hybrid Energy Harvesting**.
Chenchen Fu*, Xinhang Lu*, Xiaoxing Qiu, Sujunjie Sun, Xueyong Xu, Weiwei Wu, Chun Jason Xue, and Song Han.
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 41(11):3981–3992, November 2022. doi:10.1109/TCAD.2022.3197978

J3. **The Price of Fairness for Indivisible Goods**.
Xiaohui Bei, Xinhang Lu, Pasin Manurangsi, and Warut Suksompong.
Theory of Computing Systems (TOCS), 65(7):1069–1093, October 2021. doi:10.1007/s00224-021-10039-8. Preliminary version in IJCAI-19 (C9)

J4. **Maximin Fairness with Mixed Divisible and Indivisible Goods**.
Xiaohui Bei, Shengxin Liu, Xinhang Lu, and Hongao Wang.
Autonomous Agents and Multi-Agent Systems (JAAMAS), 35(2):34, October 2021. doi:10.1007/s10458-021-09517-7. Preliminary version in AAAI-21 (C7)

J5. **Fair Division of Mixed Divisible and Indivisible Goods**.
Xiaohui Bei, Zihao Li, Jinyan Liu, Shengxin Liu, and Xinhang Lu.
Artificial Intelligence (AIJ), 293:103436, April 2021. doi:10.1016/j.artint.2020.103436. Preliminary version in AAAI-20 (C8)

J6. **The Anatomy of the Global Football Player Transfer Network: Club Functionalities versus Network Properties**.
Xiaofan Liu, Yuliang Liu, Xinhang Lu, Qixuan Wang, and Tongxing Wang.
PLOS ONE, 11(6):e0156504, June 2016. doi:10.1371/journal.pone.0156504

Awards and Honours

- AAAI-20 Outstanding Student Paper Award — 2020
- NTU Research Scholarship, Nanyang Technological University — 2017 – 2021
- Zhang Zhiwei Scholarship, Southeast University — 2016
- Guosheng Scholarship, Southeast University — 2015
- Academic Award, Southeast University — 2014, 2015, 2016

Service and Outreach

Tutorial / Workshop Organization

- *The 14th Multidisciplinary Workshop on Advances in Preference Handling (M-PREF)* at the 32nd International Joint Conference on Artificial Intelligence (IJCAI), Macau, China — August 2023
  with Haris Aziz, Ulrich Junker, Nicholas Mattei, and Andrea Passerini
- *Developments in Fair Resource Allocation* at the 35th Australasian Joint Conference on Artificial Intelligence (AJCAI), Perth, Australia — December 2022
  with Haris Aziz, Mashbat Suzuki, and Toby Walsh

Program Committee Member

- AAAI Conference on Artificial Intelligence (AAAI): 2021 – 2023
- International Joint Conference on Artificial Intelligence (IJCAI): 2022, 2023
- International Conference on Autonomous Agents and Multiagent Systems (AAMAS): 2023
- International Joint Conference on Theoretical Computer Science – Frontier of Algorithmic Wisdom (IJTCS-FAW): 2023
- IJCAI Workshop on Computational Fair Division: 2023

Journal Reviewer

Algorithmica, Autonomous Agents and Multi-Agent Systems (JAAMAS), Games and Economic Behavior (GEB)

Conference Reviewer

AAMAS (2022), COCOA (2020), EAAMO (2022), ESA (2022), FSTTCS (2021), ISAAC (2019), MATCHUP (2022), NCTCS (2019), SAGT (2021, 2022), SODA (2021), WINE (2020, 2022)

Presentations

(excl. conference talks)

Truthful Fair Mechanism for Allocating Mixed Divisible and Indivisible Goods

- Mini Workshop on Game Theory and Fair Division, The Hong Kong Polytechnic University — May 2023

Best-of-Both-Worlds Fairness in Committee Voting

- Reading Group in the Department of Computer Science, City University of Hong Kong — May 2023
- CS 6235: Topics in Computational Social Choice, National University of Singapore — March 2023

Approval-Based Voting with Mixed Goods

- M-PREF Workshop at IJCAI-23, Macau, China — August 2023
- PhD Forum in the Summer School on Algorithmic Game Theory, CityU, OUC & Virtual — June 2023
- CMSS Summer Workshop, The University of Auckland — December 2022

Developments in Fair Resource Allocation

- Tutorial Track at AJCAI-22, Perth, Australia — December 2022

Truthful Cake Sharing

- Computational and Network Economics Track at IJTCS-FAW, Hong Kong & Virtual — August 2022
- QuACT Seminar in the Institute of Computing Technology at CAS, Virtual — March 2022

Maximin Fairness with Mixed Divisible and Indivisible Goods

- Young PhD Forum at IJTCS, Beijing, China & Virtual — August 2021

Fair Division of Mixed Divisible and Indivisible Goods

- Workshop on Fair Resource Allocation: Concept, Algorithms and Complexity at EC-21 — July 2021
- CS 6235: Topics in Computational Social Choice, National University of Singapore — February 2021