

# Shang Liu

Address: ACEX Building 349, Imperial College London,  
Exhibition Rd, South Kensington, London SW7 2BX, UK

Email: s.liu21@imperial.ac.uk

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## EDUCATION

### **Ph.D. in Operations and Analytics**

Business School, Imperial College London (ICL), London, UK.

*Sept. 2022 – Sept. 2026 (Expected)*

Advisor: Xiaocheng Li

### **M.Res. in Operations and Analytics (Distinction)**

Business School, Imperial College London (ICL), London, UK.

*Sept. 2021 – Sept. 2022*

### **B.S. in Mathematics and Applied Mathematics**

School of Mathematical Sciences, Peking University (PKU), Beijing, China.

*Sept. 2016 – Jun. 2021*

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## RESEARCH INTERESTS

My research focuses on enhancing the robustness and ethical deployment of language models through interdisciplinary frameworks of game theory, statistical learning, and optimization. I aim to develop both theoretically guaranteed (e.g., convergence analyses, complexity bounds) and empirically valid methodologies. My research interests lie in the development and theoretical analysis with a particular focus on the role of uncertainty, including uncertainty quantification, active learning, and distributionally robust optimization.

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## PUBLICATIONS

(reverse chronological order; \*: equal contribution)

### **Incentivizing High-Quality Human Annotations with Golden Questions**

Shang Liu, Zhongze Cai, Hanzhao Wang, Zhongyao Ma, Xiaocheng Li, [arXiv](#)

### **How Humans Help LLMs: Assessing and Incentivizing Human Preference Annotators**

Shang Liu\*, Hanzhao Wang\*, Zhongyao Ma, Xiaocheng Li, *under Major Revision at Management Science*, [arXiv](#)

### **Reward Modeling with Ordinal Feedback: Wisdom of the Crowd**

Shang Liu\*, Yu Pan\*, Guanting Chen, Xiaocheng Li, *ICML 2025*, [arXiv](#)

### **Towards Better Understanding of In-Context Learning Ability from In-Context Uncertainty Quantification**

Shang Liu\*, Zhongze Cai\*, Guanting Chen, Xiaocheng Li, *Transactions on Machine Learning Research*, [arXiv](#)

### **Towards Better Statistical Understanding of Watermarking LLMs**

Zhongze Cai\*, **Shang Liu\***, Hanzhao Wang\*, Huaiyang Zhong, Xiaocheng Li, *under Major Revision at Journal of the American Statistical Association*, [arXiv](#)

**When No-Rejection Learning is Consistent for Regression with Rejection**

Xiaocheng Li, **Shang Liu**, Chunlin Sun, Hanzhao Wang, *AISTATS 2024*, [arXiv](#)

**Understanding Uncertainty Sampling**

**Shang Liu**, Xiaocheng Li, *Reject and Resubmit at Journal of Machine Learning Research*, [arXiv](#)

**Distribution-Free Model-Agnostic Regression Calibration via Nonparametric Methods**

**Shang Liu\***, Zhongze Cai\*, Xiaocheng Li, *NeurIPS 2023*, [arXiv](#)

**Maximum Optimality Margin: A Unified Approach for Contextual Linear Programming and Inverse Linear Programming**

Chunlin Sun\*, **Shang Liu\***, Xiaocheng Li, *ICML 2023*, [arXiv](#)

**Non-stationary Bandits with Knapsacks**

**Shang Liu**, Jiashuo Jiang, Xiaocheng Li, *NeurIPS 2022*, [arXiv](#)

**Online Bin Packing with Known  $T$**

**Shang Liu**, Xiaocheng Li, *under Major Revision at Mathematics of Operations Research*, [arXiv](#)

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***PRIZES & AWARDS***

Dean's List for Academic Excellence at Imperial College Business School, 2021/2022

Outstanding Graduate of Peking University, 2021

*Wusi* Scholarships at Peking University, 2016/2017, 2017/2018

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***PRESENTATIONS***

Purdue Supply Chain and Operations Management Conference, 2025

Banff International Research Station Dynamic Matching and Allocation Workshop, 2025

Imperial College London Optimization Seminar, 2024