Shang Liu

Address: ACEX Building 349, Imperial College London,

Exhibition Rd, South Kensington, London SW7 2BX, UK

Email: s.liu21@imperial.ac.uk

EDUCATION

Ph.D. in Operations and Analytics
Business School, Imperial College London (ICL), London, UK.
Sept. 2022 – Jun. 2026 (Expected)
Advisor: Xiaocheng Li

M.Res. in Operations and Analytics (Distinction)
Business School, Imperial College London (ICL), London, UK.
Sept. 2021 – Jun. 2022

B.S. in Mathematics and Applied Mathematics
School of Mathematical Sciences, Peking University (PKU), Beijing, China.
Sept. 2016 – Jun. 2021

RESEARCH INTERESTS

My research focuses on enhancing the alignment, robustness, and ethical deployment of large language models (LLMs) through interdisciplinary frameworks of human-AI collaboration, 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 also lie in the development and theoretical analysis of machine learning models, with a particular focus on the role of uncertainty, including uncertainty quantification, active learning, and human-AI interaction.

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, 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](#)

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

SEVICE
Reviewer: NeurIPS, ICLR, AISTATS, ICML, TMLR

TEACHING
TA: Machine Learning, Imperial College London, Spring 2024 and Spring 2025