



# Ao Liu

Ph.D., Computer Science



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Personal Website



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Google Scholar

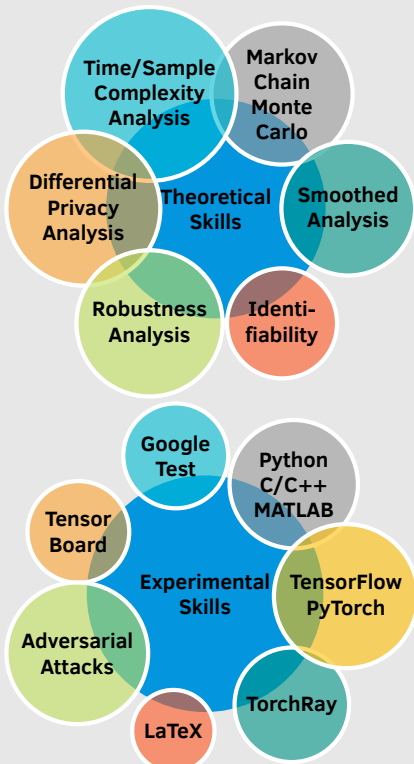


LinkedIn

## Research Fields

Learning to Rank  
Differential Privacy  
Computational Social Choice  
Recommendation Systems  
Robust and Explainable AI  
Quantum Computation

## Skills



## Education

**Ph.D., Computer Science, Rensselaer Polytechnic Institute (RPI)** Troy, NY USA  
Advisor: Lirong Xia GPA: 4.00/4.00 Jan. 2018 – May 2023  
Thesis: *Group Decision Makings from Partial Preferences* [\[Link\]](#)

**M.Eng., Material Engineering, Rensselaer Polytechnic Institute** Troy, NY USA  
Advisor: Chaitanya Ullal GPA: 3.83/4.00 Aug. 2015 – May 2018

**B.S., Mathematics and Physics, Tsinghua University** Beijing, China  
*Academic Talent Program* GPA: 85/100, Rank 8/50 Aug. 2010 – May 2014  
*Minor in Computer Technology* GPA: 84/100, 28 credits Sep. 2012 – May 2014

## Work Experience

**Research Software Engineer at Google, Sunnyvale** 07/2023- present

**Research Intern at Google, Mountain View** Summer 2022  
Project: A More Accurate Position Bias Estimator for Unbiased Learning to Rank

**Visiting Scholar at MIT-IBM Watson AI Lab** Fall 2019 and Summer 2020  
Project: Certifiably Robust Interpretation via Rényi Differential Privacy

## Accepted Papers in Computer Science

**Accelerating Voting by Quantum Computation** [\[PDF\]](#) UAI-23  
*Ao Liu, Qishen Han, Lirong Xia, and Nengkun Yu*

**Certifiably Robust Interpretation via Rényi Differential Privacy** AIJ  
*Ao Liu, Xiaoyu Chen, Sijia Liu, Lirong Xia, and Chuang Gan* [\[Link\]](#) [\[ArXiv\]](#)  
Also in *proceedings of AAAI-23 Journal Track* Oral presentation

**Differentially Private Condorcet Voting** [\[PDF\]](#) AAAI-23  
*Zhechen Li, Ao Liu, Lirong Xia, Yongzhi Cao, and Hanpin Wang* Oral presentation

**The Semi-Random Likelihood of Doctrinal Paradoxes** [\[PDF\]](#) AAAI-22  
*Ao Liu, and Lirong Xia*

**Learning Mixtures of Random Utility Models with Features from Incomplete Preferences** [\[PDF\]](#) IJCAI-22  
*Zhibing Zhao, Ao Liu, and Lirong Xia* Oral presentation

**Learning to Design Fair and Private Voting Rules** [\[PDF\]](#) JAIR  
*Farhad Mohsin, Ao Liu, Pin-Yu Chen, Francesca Rossi, and Lirong Xia*  
Also in *proceedings of IJCAI-23 Journal Track* Oral presentation

**How Private Are Commonly-Used Voting Rules?** [\[PDF\]](#) UAI-20  
*Ao Liu, Yun Lu, Lirong Xia, and Vassilis Zikas* Oral presentation

**Let It Snow: Adding Pixel Noise to Protect the Users Identity** ETRA-20 Adjunct  
*Brendan John, Ao Liu, Lirong Xia, Sanjeev Koppal, and Eakta Jain* [\[Link\]](#)

**Near-Neighbor Methods in Random Preference Completion** [\[PDF\]](#) AAAI-19  
*Ao Liu, Qiong Wu, Zhenming Liu, and Lirong Xia* Oral presentation

**Learning Plackett-Luce Mixture from Partial Preferences** [\[PDF\]](#) AAAI-19  
*Ao Liu, Zhibing Zhao, Chao Liao, Pinyan Lu, and Lirong Xia* Oral presentation

**Differential Privacy for Eye-Tracking Data** [\[PDF\]](#) ETRA-19  
*Ao Liu, L. Xia, A. Duchowski, R. Bailey, K. Holmqvist, and E. Jain* Oral presentation

## Non-Archival Papers in Computer Science

**Smoothed Differential Privacy** [\[PDF\]](#) Under Review  
*Ao Liu, Yu-Xiang Wang, and Lirong Xia*

**Trading Off Voting Axioms for Privacy** [\[PDF\]](#) Under Review  
*Zhechen Li, Ao Liu, Lirong Xia, Yongzhi Cao, and Hanpin Wang*



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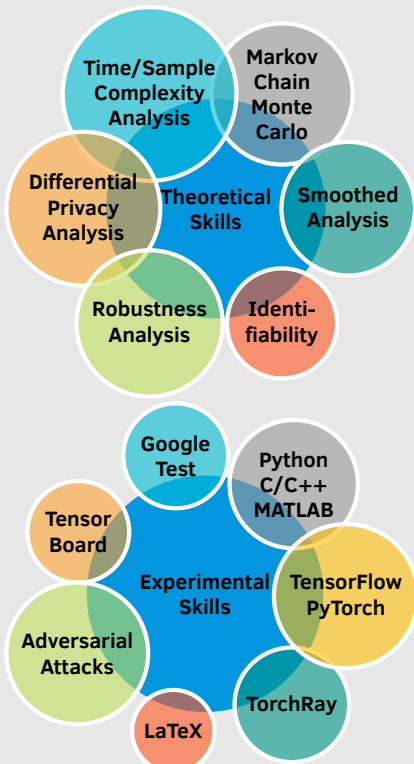


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**Truthful Information Elicitation from Hybrid Crowd [PDF]**

*Under Review*

Qishen Han, Sikai Ruan, [Ao Liu](#), Farhad Mohsin, Lirong Xia, and Yuqing Kong

**Group Decisions from Natural Language-Based Preferences [PDF]**

*COMSOC-21*

Farhad Mohsin, L. Luo, W. Ma, I. Kang, Z. Zhao, [Ao Liu](#), R. Vaish, and Lirong Xia

## Patents

**Certiably Robust Interpretation**

*US 2022/0067505 A1*

[Ao Liu](#), Sijia Liu, Bo Wu, Lirong Xia, Qi Cheng Li, and Chuang Gan

**Interpretation Maps with Guaranteed Robustness**

*US 2021/0383497 A1*

[Ao Liu](#), Sijia Liu, Abhishek Bhandwaladar, Chuang Gan, Lirong Xia, and Qi Cheng Li

## Accepted Papers in Material Physics

**Simulation of pulse responses of lithium salt-doped poly-ethyleneoxide [Link]**

*J. Polym. Sci. B: Polymer Physics*

Cover paper finalist

[Ao Liu](#), F. Zeng, Y. Hu, S. Lu, W. Dong, X. Li, C. Chang, and D. Guo

*Apr. 2016*

**Thresholds of frequency selectivity of Pt/poly**

*Solid State Ionics*

**(3-hexylthiophene-2,5-diyl)/polyethylene oxide+Mg<sup>2+</sup>/Pt heterojunctions [Link]**

F. Zeng, S. Lu, W. Dong, [Ao Liu](#), X. Li, and C. Chang

*Feb. 2016*

**Effect of heavy-ion on frequency selectivity of semiconducting polymer/electrolyte heterojunction [Link]**

*RSC Advances*

*Nov. 2015*

W. Dong, F. Zeng, S. Lu, X. Li, C. Chang, [Ao Liu](#), F. Pan, and D. Guo

**Excitatory post-synaptic current and synaptic plasticity of semiconducting polymer/electrolyte system [Link]**

*NVMTS-15*

*Oct. 2015*

F. Zeng, F. Li, J. Zhang, Y. Hu, W. Dong, S. Lu, and [Ao Liu](#)

**Influence of ionic size to the pulse responses of semiconducting polymer/electrolyte hetero-junctions [Link]**

*NVMTS-15*

*Oct. 2015*

F. Li, F. Zeng, J. Zhang, Y. Hu, W. Dong, S. Lu, and [Ao Liu](#)

**Frequency-dependent learning achieved using semiconducting polymer/electrolyte composite cells [Link]**

*Nanoscale*

*Sep. 2015*

W. Dong, F. Zeng, S. Lu, [Ao Liu](#), X. Li, and F. Pan

**Controlling Ion Conductance and Channels to Achieve Synaptic-like Frequency Selectivity [Link]**

*Nano-Micro Letters*

*Dec. 2014*

S. Lu., F. Zeng, W. Dong, [Ao Liu](#), X. Li, and J. Luo

**Optical fiber sensor based on the short-range surface plasmon polariton mode [Link]**

*Chinese Optics Letters*

*Jan. 2014*

X. Wang, F. Liu, [Ao Liu](#), B. Fan, K. Cui, X. Feng, W. Zhang, and Y. Huang

## Services, Awards, and Teaching

**Journal Reviewer:** Information Sciences, Sankhya B, and TMLR

**Conference Reviewer:** NeurIPS (20,21,22&23), ICML (22&23), AAAI (21&22), ICLR-23, and IJCAI-22

**RPI-IBM AI Horizon Scholarship**

*Sep. 2019 – May 2022*

Supported by Rensselaer-IBM Artificial Intelligence Research Collaboration

**RPI Presidential Graduate Research Fellowship**

*Sep. 2016 – May 2017*

A One-Year Fellowship for Outstanding Graduate Students [[Certificate](#)]

**Teaching Assistant of CSCI 4150: Introduction to AI**

*Spring 2023*

Instructor: Lirong Xia

**Guest Lecture at CSCI 4967/6967: Economics and Computation**

*Apr. 2021*

**Teaching Assistant of MATH 1020: Calculus II**

*Fall 2017*

Instructor: David A. Schmidt