

# Ao Liu

Ph.D., Computer Science



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Personal Website



aoliu.cs@gmail.com



Google Scholar

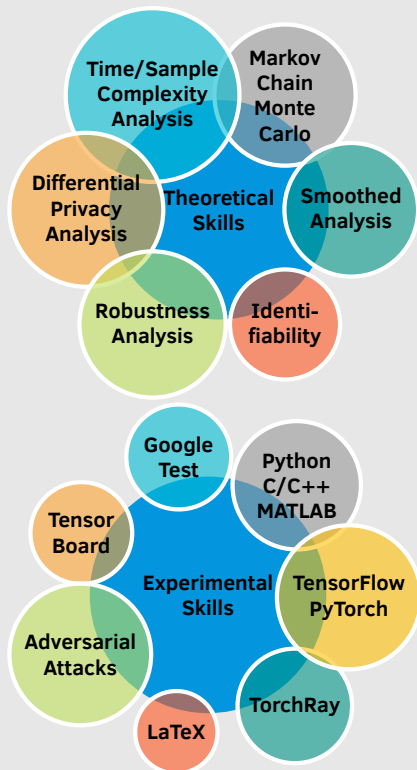


LinkedIn

## Research Fields

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

## Skills



## Services and Awards

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

Conference Reviewer: *NeurIPS* (20-23), *AAAI* (21&22), *ICML* (22&23), *ICLR* (23&24) and *IJCAI-22*

RPI-IBM AI Horizon Scholarship

RPI Presidential Graduate Research Fellowship

## 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, Mountain View** 07/2023- present  
Design and Research Efficient and Effective Recommendation Systems

**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

**Smoothed Differential Privacy** [ArXiv] TMLR  
*Ao Liu*, Yu-Xiang Wang, and Lirong Xia

**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

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

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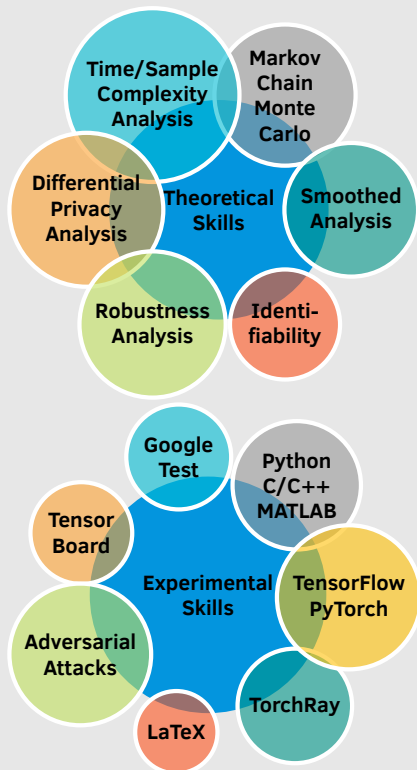
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**RPI-IBM AI Horizon Scholarship**

**RPI Presidential Graduate Research Fellowship**

**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 Bhandwaldar, 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, X. 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

X. 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*, *TMLR*, *ACM ToIS*, and *Sankhya B*

**Conference Reviewer:** *NeurIPS* (20,21,22&23), *ICML* (22&23), *ICLR* (23&24), *AAAI* (21&22), 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