

# Ao Liu

Ph.D., Computer Science



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Personal Website



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Google Scholar

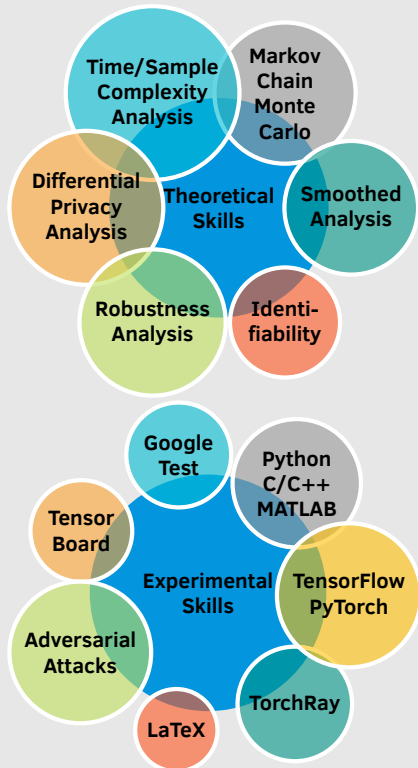


LinkedIn

## Research Fields

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

## Skills



## Services and Awards

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

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

**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

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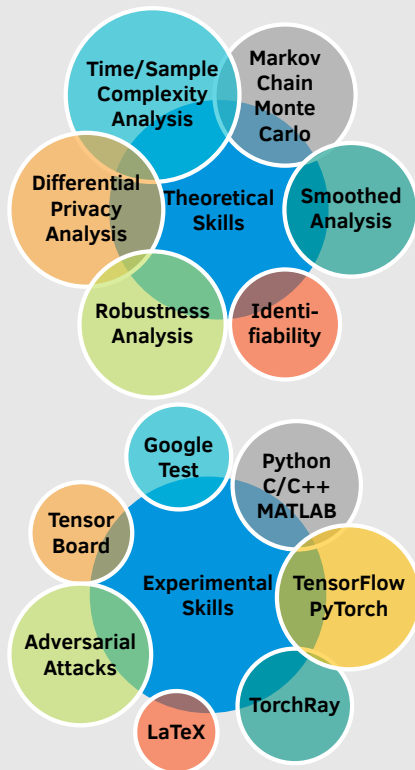


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*ICML* (22&23), *ICLR-23* and *IJCAI-22*

RPI-IBM AI Horizon Scholarship

RPI Presidential Graduate Research Fellowship

## Patents

**Certifiably 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** *J. Polym. Sci. B: Polymer Physics*  
*Ao Liu*, F. Zeng, Y. Hu, S. Lu, W. Dong, X. Li, C. Chang, and D. Guo *Cover paper finalist Apr. 2016* [\[Link\]](#)

**Thresholds of frequency selectivity of Pt/poly (3-hexylthiophene-2,5-diyl)/polyethylene oxide+Mg<sup>2+</sup>/Pt heterojunctions** *Solid State Ionics*  
F. Zeng, S. Lu, W. Dong, *Ao Liu*, X. Li, and C. Chang *Feb. 2016* [\[Link\]](#)

**Effect of heavy-ion on frequency selectivity of semiconducting polymer/electrolyte heterojunction** *RSC Advances*  
W. Dong, F. Zeng, S. Lu, X. Li, C. Chang, *Ao Liu*, F. Pan, and D. Guo *Nov. 2015* [\[Link\]](#)

**Excitatory post-synaptic current and synaptic plasticity of semiconducting polymer/electrolyte system** *NVMTS-15*  
F. Zeng, F. Li, J. Zhang, Y. Hu, W. Dong, S. Lu, and *Ao Liu* *Oct. 2015* [\[Link\]](#)

**Influence of ionic size to the pulse responses of semiconducting polymer/electrolyte hetero-junctions** *NVMTS-15*  
F. Li, F. Zeng, J. Zhang, Y. Hu, W. Dong, S. Lu, and *Ao Liu* *Oct. 2015* [\[Link\]](#)

**Frequency-dependent learning achieved using semiconducting polymer/electrolyte composite cells** *Nanoscale*  
W. Dong, F. Zeng, S. Lu, *Ao Liu*, X. Li, and F. Pan *Sep. 2015* [\[Link\]](#)

**Controlling Ion Conductance and Channels to Achieve Synaptic-like Frequency Selectivity** *Nano-Micro Letters*  
S. Lu., F. Zeng, W. Dong, *Ao Liu*, X. Li, and J. Luo *Dec. 2014* [\[Link\]](#)

**Optical fiber sensor based on the short-range surface plasmon polariton mode** *Chinese Optics Letters*  
X. Wang, F. Liu, *Ao Liu*, B. Fan, K. Cui, X. Feng, W. Zhang, and Y. Huang *Jan. 2014* [\[Link\]](#)

## Experiences and Awards

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

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 [\[Certificate\]](#)

**Member of Alpha Sigma Mu** [\[Certificate\]](#) *Since 2016*  
An Honor Society for Material Science & Engineering

## Teaching at Rensselaer

**Teaching Assistant of CSCI 4150: Introduction to AI** *Spring 2023*  
Instructor: Lirong Xia

**Guest Lecture at CSCI 4967/6967: Economics and Computation** *Apr. 2021*  
Topic: The Semi-Random Likelihood of Doctrinal Paradoxes

**Teaching Assistant of MATH 1020: Calculus II** *Fall 2017*  
Instructor: David A. Schmidt