

# Ao Liu

Ph.D., Computer Science



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Personal Website



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Google Scholar

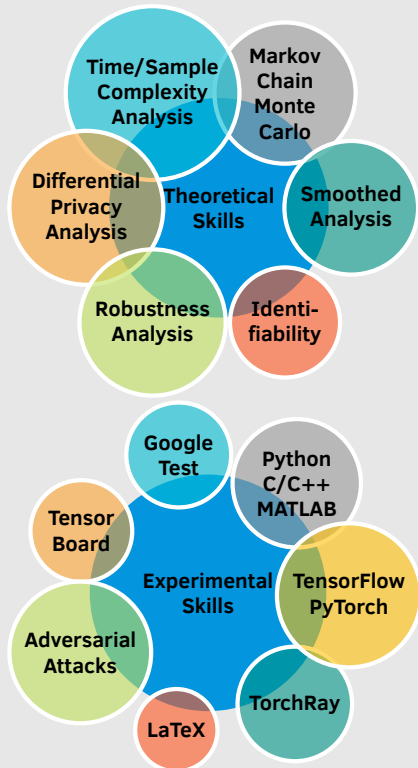


LinkedIn

## 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  
*Differential Privacy and Machine Learning* Jan. 2018 – May 2023  
Advisor: Lirong Xia GPA: 4.00/4.00

**M.Eng., Material Engineering, Rensselaer Polytechnic Institute** Troy, NY USA  
*Super-Resolution Microscopy and Polymer Physics* Aug. 2015 – May 2018  
Advisor: Chaitanya Ullal GPA: 3.83/4.00

**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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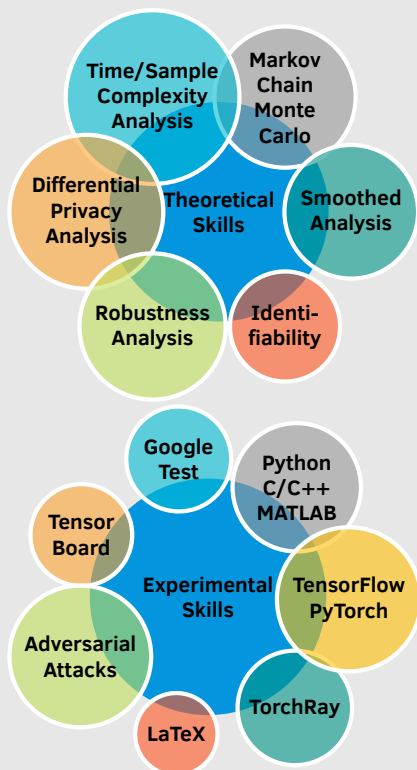


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**RPI-IBM AI Horizon Scholarship**

**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**

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

**lithium salt-doped poly-ethyleneoxide** [\[Link\]](#)

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

## 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