

Ao Liu

Ph.D., Computer Science



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Personal Website



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Google Scholar

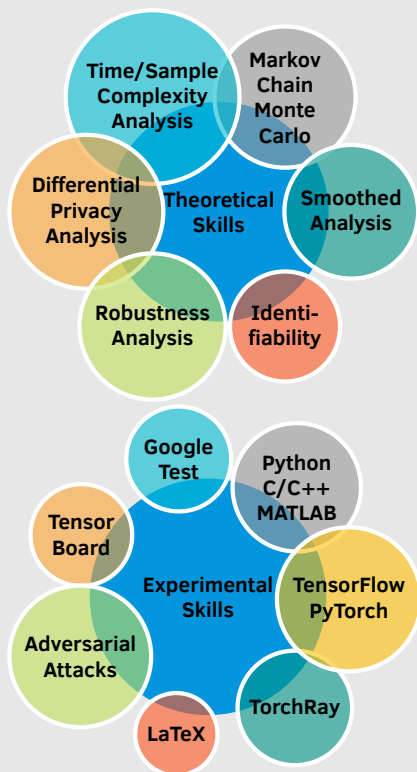


LinkedIn

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, Sunnyvale 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 Conference Papers

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

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

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

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

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

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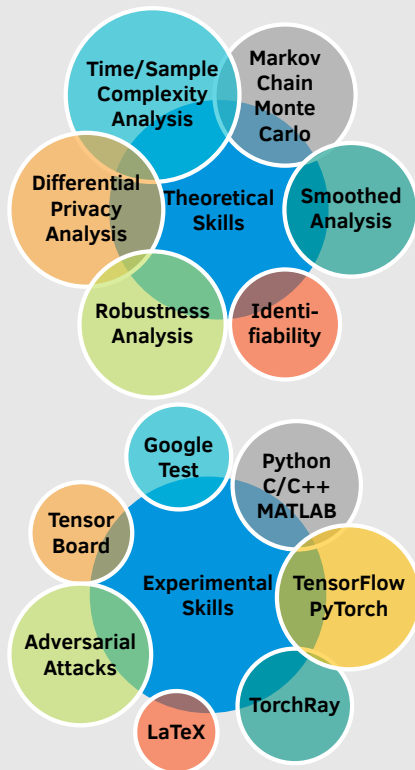


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RPI-IBM AI Horizon Scholarship

RPI Presidential Graduate Research Fellowship

Accepted Journal Papers

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

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

Simulation of pulse responses of lithium salt-doped poly-ethyleneoxide [\[Link\]](#) *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

Thresholds of frequency selectivity of Pt/poly (3-hexylthiophene-2,5-diyl)/polyethylene oxide+Mg²⁺/Pt heterojunctions [\[Link\]](#) *Solid State Ionics*
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*
W. Dong, F. Zeng, S. Lu, X. Li, C. Chang, [Ao Liu](#), F. Pan, and D. Guo Nov. 2015

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

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

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

Non-Archival Papers

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

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

Services, Awards, and Teaching

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

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