

SAFWAN HOSSAIN

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EDUCATION

Harvard University <i>Ph.D. in Computer Science</i> Advisor: Dr. Yiling Chen (EconCS group)	September 2022 - <i>Present</i>
University of Toronto <i>MSc. in Computer Science</i> Advisor: Dr. Nisarg Shah (Theory group)	September 2018 - May 2020
University of Toronto <i>B.A.S.c in Electrical and Computer Engineering - High Honours</i>	September 2013 - May 2018 cGPA: 3.95/4.00

RESEARCH INTERESTS

- ◊ **Economics and Computation:** Information Design, Market Design, Algorithmic Game Theory.
- ◊ **Machine Learning:** Online Learning, Strategic Behaviour, Multi-Agent Systems.

WORK EXPERIENCE

Cerebras Systems - <i>Machine Learning Engineer</i>	July 2020 - August 2022
As a core member of the machine learning team at Cerebras Systems, my projects included building a custom Tensorflow XLA backend, developing a new distributed training approach for ultra-large models, and exploring state-of-the-art sparse training algorithms - all for our custom hardware.	
Xanadu AI - <i>Research Intern</i>	September 2019 - January 2020
At Xanadu AI, a photonic quantum computing firm, I worked alongside the quantum machine learning research team to investigate new hybrid (quantum-classical) computational models that offer significant advantages for both discriminative and generative tasks.	
Intel - <i>Compiler Engineer</i>	May 2016 - August 2017
I was part of Intel's FPGA compiler team, working on optimization algorithms to reduce clock skew. I initiated and led a project that modeled clock placement as a constraint satisfaction problem which resulted in a 1.5% increase in the maximum operating frequency of the Stratix 10 FPGA.	

PUBLICATIONS

- Daniel Halpern, **Safwan Hossain**, Jamie Tucker-Foltz. *Computing Voting Rules with Elicited Incomplete Votes*. 24th ACM Conference on Economics and Computation (**EC 2024**).
- Safwan Hossain**, Tao Lin, Tonghan Wang, David C. Parkes, Yiling Chen, Haifeng Xu. *Multi-Sender Persuasion - A Computational Perspective*. 41st International Conference on Machine Learning (**ICML 2024**).
- Safwan Hossain**, Andjela Mladenovic, Yiling Chen, Gauthier Gidel. *A Persuasive Approach to Combating Misinformation*. 41st International Conference on Machine Learning (**ICML 2024**).
- Safwan Hossain**, Yiling Chen. *Equilibrium and Learning in Fixed-Price Data Markets with Externality*. 41st International Conference on Machine Learning (**ICML 2024**).

5. Edwin Zhang, Sadie Zhao, Tonghan Wang, **Safwan Hossain**, Henry Gasztowtt, Stephan Zhang, David C. Parkes, Milind Tambe, Yiling Chen. *Social Environment Design*. 41st International Conference on Machine Learning (**ICML 2024**).
6. Siddhartha Banerjee, Vasilis Gkatzelis, **Safwan Hossain**, Billy Jin, Evi Micha, Nisarg Shah. *Proportionally Fair Online Allocation of Public Goods with Predictions*. 33rd International Joint Conference on Artificial Intelligence (**IJCAI 2023**).
7. **Safwan Hossain**, Evi Micha, and Nisarg Shah. *Fair Algorithms for Multi-Agent Multi-Armed Bandits*. 35th Conference on Neural Information Processing Systems (**NeurIPS 2021**).
8. **Safwan Hossain** and Nisarg Shah. *The Effect of Strategic Noise on Linear Regression*. 19th International Conference on Autonomous Agents and Multiagent Systems (**AAMAS 2020**).
9. **Safwan Hossain**, Andjela Mladenovic, and Nisarg Shah. *Designing Fairly Fair Classifiers via Economic Fairness Notions*. 29th International World Wide Web Conference (**WWW 2020**).
10. **Safwan Hossain**, Evi Micha, and Nisarg Shah. *The Surprising Power of Hiding Information in Facility Location*. 34th AAAI Conference on Artificial Intelligence (**AAAI 2020**).
11. John Chen, Ian Berlot-Atwell, **Safwan Hossain**, Xindi Wang, Frank Rudzicz. *Analyzing Text Specific vs Blackbox Fairness Algorithms in Multimodal Clinical NLP*. 3rd Clinical Natural Language Processing Workshop at EMNLP 2020. **Best Paper Award**.
12. **Safwan Hossain** and Jonathan Lorraine. *JacNet: Learning Functions with Structured Jacobians*. Workshop on Invertible Neural Nets and Normalizing Flows at ICML 2019
13. Akshay Budhkar, Krishnapriya Vishnubhotla, **Safwan Hossain**, Frank Rudzicz. *Generative Adversarial Networks for Text Using word2vec Intermediaries*. Workshop on Representation Learning at ACL 2019

AWARDS AND DISTINCTIONS

- ◇ Recipient of the Ontario Provincial Graduate Scholarship June 2019
- ◇ Recipient of the Vector Research Grant May 2019
- ◇ Recipient of the Vector Institute Scholarship in Artificial Intelligence November 2018
- ◇ Recipient of the Arts and Science Graduate Fellowship October 2018
- ◇ Recipient of the Wolfond Graduate Scholarship September 2018
- ◇ Recipient of the Governor General's Bronze Medal June 2013
- ◇ Ranked in the Top 20 graduating students in British Columbia June 2013

SERVICE

- ◇ Reviewer for AAMAS 2025, NeurIPS 2024, WWW 2024, NeurIPS 2023, AAAI 2021.
- ◇ Invited Talk at 2024 INFORMS Annual Meeting
- ◇ Invited Talk at Harvard EconCS Seminar

TEACHING

- ◇ CS126 Fairness and Privacy (Harvard) - *Teaching Fellow* Fall 2024
- ◇ CS257 Semidefinite Optimization (Harvard) - *Teaching Fellow* Spring 2024
- ◇ CS236 Economics and Computation (Harvard) - *Teaching Fellow* Fall 2023
- ◇ CS180 Introduction to Programming (UToronto) - *Teaching Fellow* Fall 2018

TECHNICAL SKILLS

- ◇ **Modeling/Simulations:** MATLAB, Mathematica
- ◇ **Programming Languages/Frameworks:** Python, C/C++, PyTorch, TensorFlow, cvxpy