SAFWAN HOSSAIN

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EDUCATION

Harvard University September 2022 - *Present*
Ph.D. in Computer Science
Advisor: Dr. Yiling Chen (EconCS group)

University of Toronto September 2018 - May 2020
MSc. in Computer Science
Advisor: Dr. Nisarg Shah (CS Theory group)

University of Toronto September 2013 - May 2018
B.A.S.c in Electrical and Computer Engineering - High Honours cGPA: 3.95/4.00

RESEARCH INTERESTS

Economics and Computation: Algorithmic Game Theory, Information Design, Mechanism Design.
Machine Learning: Online Learning, Learning with Strategic Agents, Multi-Agent Systems, LLMs

INDUSTRY EXPERIENCE

Morgan Stanley - *Machine Learning Research Intern* May 2025 - August 2025

Working in the Machine Learning Research Team with Yuriy Nevmyvaka and Michael Kearns to investigate a research problem on online resource allocation under market dynamics and strategic interactions.

Google Research - *Student Researcher* March 2025 - May 2025

Working in the Market Algorithms Research group with Renato Paes-Leme and Song Zuo to investigate novel auction and mechanism design problems posed by the widespread adoption of LLMs.

Cerebras Systems - *Machine Learning Engineer* July 2020 - August 2022

Member of the ML Frameworks team. Projects included building a custom Tensorflow XLA backend, a distributed training pipeline, and exploring sparse training algorithms - all for our custom chip.

Intel - *Compiler Engineer* May 2016 - August 2017

Member of the FPGA compiler team. I led a project that remodeled clock placement to minimize clock skew, increasing the operating frequency of the Stratix 10 FPGA by 1.5%.

JOURNAL PUBLICATIONS

1. **Safwan Hossain** and Nisarg Shah. *The Effect of Strategic Noise on Linear Regression.* Journal of Autonomous Agents and Multiagent Systems. October 2021.

FULL LENGTH CONFERENCE PUBLICATIONS

1. **Safwan Hossain**, Yatong Chen, Yiling Chen. *Strategic Hypothesis Testing.* 39$^{\text{th}}$ Conference on Neural Information Processing Systems **(NeurIPS 2025) - Spotlight - Top 3% of Submissions**.
2. **Safwan Hossain**, Evi Micha, Yiling Chen, Ariel Procaccia. *Strategic Classification With Externalities.* 13$^{\text{th}}$ International Conference on Learning Representations **(ICLR 2025)**.
3. Daniel Halpern, **Safwan Hossain**, Jamie Tucker-Foltz. *Computing Voting Rules with Elicited Incomplete Votes.* 24$^{\text{th}}$ ACM Conference on Economics and Computation **(EC 2024)**.
4. **Safwan Hossain**, Tao Lin, Tonghan Wang, David C. Parkes, Yiling Chen, Haifeng Xu. *Multi-Sender Persuasion - A Computational Perspective.* 41$^{\text{st}}$ International Conference on Machine Learning **(ICML 2024)**.

5. **Safwan Hossain**, Andjela Mladenovic, Yiling Chen, Gauthier Gidel. *A Persuasive Approach to Combating Misinformation.* 41st International Conference on Machine Learning **(ICML 2024)**.
6. **Safwan Hossain**, Yiling Chen. *Equilibrium and Learning in Fixed-Price Data Markets with Externality.* 41st International Conference on Machine Learning **(ICML 2024)**.
7. 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)**.
8. 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)**.
9. **Safwan Hossain**, Evi Micha, and Nisarg Shah. *Fair Algorithms for Multi-Agent Multi-Armed Bandits.* 35th Conference on Neural Information Processing Systems **(NeurIPS 2021)**.
10. **Safwan Hossain** and Nisarg Shah. *The Effect of Strategic Noise on Linear Regression.* 19th International Conference on Autonomous Agents and Multiagent Systems **(AAMAS 2020)**.
11. **Safwan Hossain**, Andjela Mladenovic, and Nisarg Shah. *Designing Fairly Fair Classifiers via Economic Fairness Notions.* 29th International World Wide Web Conference **(WWW 2020)**.
12. **Safwan Hossain**, Evi Micha, and Nisarg Shah. *The Surprising Power of Hiding Information in Facility Location.* 34th AAAI Conference on Artificial Intelligence **(AAAI 2020).**

WORKSHOP PUBLICATIONS

1. 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**.
2. **Safwan Hossain** and Jonathan Lorraine. *JacNet: Learning Functions with Structured Jacobians.* Workshop on Invertible Neural Nets and Normalizing Flows at ICML 2019
3. Akshay Budhkar, Krishnapriya Vishnubhotla, **Safwan Hossain**, Frank Rudzicz.*Generative Adversarial Networks for Text Using word2vec Intermediaries.* Workshop on Representation Learning at ACL 2019

WORKING PAPERS

1. **Safwan Hossain**, Tao Lin, Sai Ravindranath, Paul Duetting, Renato Paes Leme, Haifeng Xu, Song Zuo. *Information Design with Large Language Models.*
2. Gerson Personnat, Tao Lin, **Safwan Hossain**, David Parkes. *Learning to Lead Many: Online Bayesian Stackelberg Games.*

AWARDS AND DISTINCTIONS

◇ Google PhD Fellowship in Algorithms and Optimization — September 2025
◇ Winning Submission for the ProSocial Ranking Challenge — October 2024
◇ Ontario Provincial Graduate Scholarship — June 2019
◇ Vector Institute Scholarship in Artificial Intelligence — November 2018
◇ University of Toronto Arts and Science Graduate Fellowship — October 2018
◇ Wolfond Graduate Scholarship — September 2018
◇ University of Toronto President's Scholarship — April 2014
◇ Governor General's Bronze Medal — June 2013
◇ Ranked in the Top 20 graduating students in British Columbia — June 2013

TALKS

◇ 2025 INFORMS Annual Meeting Invited Talk – *Equilibrium of Data Markets with Externality*
◇ Morgan Stanley Machine Learning Seminar – *Information Design in the Information Age*
◇ 2025 SIGecom Winter Meeting – *Framing and Signaling: LLMs for Information Design*
◇ 2024 INFORMS Annual Meeting Invited Talk – *A Persuasive Approach to Combating Misinformation*
◇ Econometric Society Interdisciplinary Frontiers 2024 – *Multi Sender Persuasion*
◇ Harvard EconCS Seminar – *Equilibrium of Data Markets with Externality*

SERVICE

- PC Member for NeurIPS (2025, 2024, 2023), EC (2025), ICLR (2025), ICML (2024, 2025), WebConf (2024)
- Journal Reviewer for TEAC and JAIR
- Co-editor for the proceedings of the 2025 SIGecom Winter Meeting
- Co-founder and Treasurer of the Harvard Bangladeshi Students Association
- Volunteer with the Cambridge Math Circle

TEACHING AND ADVISING

- CS126 Computational 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
- CS373 Algorithms and Data Structures (UToronto) - *Teaching Fellow* — Spring 2020
- Computer Science Help Center (UToronto) - *Teaching Fellow* — Spring 2019
- CS120 Computer Science for the Sciences (UToronto) - *Teaching Fellow* — Fall 2018

- Senior Thesis Advisor for Katherine Zhang (Harvard) — 2022/2023
- Senior Thesis Advisor for Gerson Personnat (Harvard) — 2024/2025
- Senior Thesis Advisor for Russell Li (Harvard) — 2025/2026

REFERENCES

- **Dr. Yiling Chen**
  - *David McKay Professor of Computer Science*, Harvard University
  - Email: `yiling@seas.harvard.edu`
- **Dr. David C. Parkes**
  - *John A. Paulson Dean, George F. Colony Professor of Computer Science*, Harvard University
  - Email: `parkes@eecs.harvard.edu`
- **Dr. Renato Paes Leme**
  - *Principal Research Scientist*, Google Research
  - Email: `renatoppl@google.com`
- **Dr. Haifeng Xu**
  - *Assistant Professor*, University of Chicago
  - Email: `haifengxu@uchicago.edu`
- **Dr. Ariel Procaccia**
  - *Alfred and Rebecca Lin Professor of Computer Science*, Harvard University
  - Email: `arielpro@seas.harvard.edu`

TECHNICAL SKILLS

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

CITIZENSHIP

- Canadian Citizen