Soroush Ebadian

ebadian.org
soroush@cs.toronto.edu
+1 (647) 937-3617

Education

- **Ph.D. in Computer Science** — Sep. 2020 – Present
  University of Toronto, Canada — GPA: 4.0+/4.0
  Advisor: Nisarg Shah
- **B.Sc. in Computer Engineering** — Sep. 2015 – Aug. 2020
  Sharif University of Technology, Tehran, Iran — GPA: 18.68/20

Academic Experience

- **Machine Learning Research Intern, Borealis AI**, Toronto, Canada — Sep. 2024 – Present
  Conducted research on deep multi-task learning models for time series data.
- **Visiting Researcher, Harvard University**, Boston, USA — Sep. – Dec. 2023
  Investigated problems in computational social choice and AI alignment. Host: Ariel D. Procaccia
- **Developer, Spliddit.org** — June 2023 – Present
  A not-for-profit website providing free access to provably fair automated decision-making algorithms, used by more than 250,000 people to date. Enhanced the efficiency of the existing goods division algorithm and developed an improved algorithm for task division.
- **Research Intern, Institute of Science and Technology Austria**, Austria — Jul. – Sep. 2019
  Designed and implemented verification techniques for concurrent programs in the CIVL language and verifier, which is an extension of the Boogie verifier. Host: Thomas A. Henzinger
- **Technical Manager,** CafeBazaar, Tehran, Iran — Jan. 2017 – Sep. 2020
  - *CafeBazaar Cloud*: Led three teams of 5-10 engineers to develop six cloud infrastructure services — offering storage, database, and big-data management solutions to tech companies serving tens of millions of users.
  - *Divar*: Launched a multi-platform buyer-seller chat feature for Divar, an online classified ads service with 16 million users.
- **Software Engineer,** CafeBazaar, Tehran, Iran — Apr. 2015 – Jan. 2017
  - Developed a buyer-seller chat feature for Divar's iOS app, used by over 2 million users.
  - Redesigned and scaled the backend architecture, increasing capacity from 25 million to over 100 million daily requests.

Selected Honors and Awards

- **Gold medal** in the **National Olympiad in Informatics**, Iran — 2014
- **2nd place** in the **ACM-ICPC** West Asia Regional Contest, Tehran, Iran — 2015
- **Ontario Graduate Scholarship** (C$15000) — 2023
  Government of Ontario and University of Toronto
- Alfred B. Lehman Graduate Scholarship in Computer Science (C$5000) — 2023 and 2024
  Dept. of Computer Science, University of Toronto
- Computer Science 50th Anniversary Graduate Scholarship (C$2000) — 2022
  Dept. of Computer Science, University of Toronto
- **4th place** in the **National Scientific Olympiad in Computer Science and Engineering**, Iran — 2019
- Research Scholarship from the Austrian Agency for International Cooperation in Education and Research (OeAD-GmbH) (€3000) — Summer 2019

Peer-reviewed Conference Publications (Authors are listed alphabetically in all papers)

C12. P. A. Alamdari, **S. Ebadian**, A. D. Procaccia, "Policy Aggregation," *in Proc. of 38th Annual Conf. on Neural Information Processing Systems* (**NeurIPS'24**), 2024. Forthcoming.

C11. **S. Ebadian**, R. Freeman, N. Shah, "Harm Ratio: A Novel and Versatile Fairness Criterion," *in Proc. of 4th ACM Conf. on Equity and Access in Algorithms, Mechanisms, and Optimization* (**EAAMO'24**), pp. 1–14, 2024.

C10. **S. Ebadian**, D. Halpern, E. Micha, "Metric Distortion with Elicited Pairwise Comparisons," *in Proc. of 33rd Int. Joint Conf. on Artificial Intelligence* (**IJCAI'24**), pp. 2791–2798, 2024.

C9. **S. Ebadian**, A. Filos-Ratsikas, M. Latifian, N. Shah, "Computational Aspects of Distortion," *in Proc. of 23rd Int. Conf. on Autonomous Agents and MultiAgent Systems* (**AAMAS'24**), pp. 499–507, 2024.

C8. **S. Ebadian**, A. Filos-Ratsikas, M. Latifian, N. Shah, "Explainable and Efficient Randomized Voting Rules," *in Proc. of 37th Annual Conf. on Neural Information Processing Systems* (**NeurIPS'23**), pp. 23034-23046, 2023.

C7. **S. Ebadian**, M. Latifian, N. Shah, "The Distortion of Approval Voting with Runoff," *in Proc. of 22nd Int. Conf. on Autonomous Agents and MultiAgent Systems* (**AAMAS'23**), pp. 1752–1760, 2023.

C6. **S. Ebadian**, G. Kehne, E. Micha, A. D. Procaccia, and N. Shah, "Is Sortition Both Representative and Fair?," *in Proc. of 36th Annual Conf. on Neural Information Processing Systems* (**NeurIPS'22**), pp. 3431–3443, 2022.

C5. **S. Ebadian**, A. Kahng, D. Peters, and N. Shah, "Optimized Distortion and Proportional Fairness in Voting," *in Proc. of 23rd ACM Conf. on Economics and Computation* (**EC'22**), pp. 563–600, 2022.

C4. **S. Ebadian**, R. Freeman, and N. Shah, "Efficient Resource Allocation with Secretive Agents," *in Proc. of 31st Int. Joint Conf. on Artificial Intelligence* (**IJCAI'22**), pp. 272–278, 2022.

C3. **S. Ebadian**, D. Peters, and N. Shah, "How to Fairly Allocate Easy and Difficult Chores," *in Proc. of 21st Int. Conf. on Autonomous Agents and MultiAgent Systems* (**AAMAS'22**), pp. 372–380, 2022.

C2. **S. Ebadian** and X. Huang, "Fast Algorithm for k-Truss Discovery on Public-Private Graphs," *in Proc. of 28th Int. Joint Conf. on Artificial Intelligence* (**IJCAI'19**), pp. 2258–2264, 2019.

C1. **S. Ebadian** and H. Zarrabi-Zadeh, "A Simple Randomized Algorithm for All Nearest Neighbors," *in Proc. of 31st Canadian Conf. on Computational Geometry* (**CCCG'19**), pp. 94–98, 2019.
Invited to the special issue of the journal of Computational Geometry.

Journal Publication (Authors are listed alphabetically in all papers)

J1. **S. Ebadian**, A. Kahng, D. Peters, and N. Shah, "Optimized Distortion and Proportional Fairness in Voting," *in ACM Transactions on Economics and Computation,* (**TEAC**), Vol. 12, Issue 1, pp. 1–39, 2024.

Working Papers (Authors are listed alphabetically in all papers)

W1. **S. Ebadian** and E. Micha, "Boosting Sortition via Proportional Representation," 2024. (Under submission at AAMAS'25)

W2. **S. Ebadian** and N. Shah, "Every Bit Helps: Achieving the Optimal Distortion with a Few Queries," 2024. (Under submission at AAAI'25)

W3. B. Cookson, **S. Ebadian**, and N. Shah, "Temporal Fair Division," 2024. (Under submission at AAAI'25)

W4. B. Cookson, **S. Ebadian**, and N. Shah, "Constrained Fair and Efficient Allocations," 2024. (Under submission at AAAI'25)

W5. S. Barman, **S. Ebadian**, M. Latifian, and N. Shah, "Fair Division with Market Values," 2024. (Under submission at AAAI'25)

Academic Service

- **Program Committee Member:** AAAI (2025, 2024, 2023), NeurIPS 2024, AIES (2024, 2023)
- **Journal Reviewer**: Journal of Artificial Intelligence (AIJ), Games and Economic Behavior (GEB), ACM Transactions on Economics and Computation (TEAC), SIAM Journal on Discrete Mathematics (SIDMA), Journal of Mathematical Social Sciences (JMSS)
- **Conference Reviewer:** EC 2024, SODA 2024, SAGT 2021

Teaching Experience

- **Teaching Assistant,** Department of Computer Science, University of Toronto
  - CSC2421 Mathematical Foundations of Algorithmic Fairness — Winter 2024
  - CSC473 Advanced Algorithm Design — Winter 2024
  - CSC263 Data Structures and Analysis — Summer 2021, Summer 2024, and Fall 2024
  - CSC2412 Algorithms for Private Data Analysis — Winter 2023
  - CSC373 Algorithm Design, Analysis, and Complexity (Lead TA) — Fall 2023
  - CSC373 Algorithm Design, Analysis, and Complexity — Fall 2021 and Summer 2022
  - CSC303 Social and Economic Networks — Winter 2021 and Winter 2023
  - CSC304 Algorithmic Game Theory and Mechanism Design — Fall 2022
  - CSC2556 Algorithms for Collective Decision Making — Winter 2022
- **Teaching Assistant,** Computer Engineering Department, Sharif University of Technology
  - Design and Analysis of Algorithms — Fall 2017, 2018, and 2019
  - Discrete Structures — Spring 2019
  - Algorithmic Game Theory — Spring 2019
  - System Analysis and Design — Fall 2018 and Spring 2019
  - Data Structures and Algorithms — Spring 2016
- **Instructor**, Iranian National Olympiad in Informatics Summer Camp — 2016, 2017, and 2020
  Taught advanced algorithms, data structures, and graph theory to students preparing for the IOI.
- **Lecturer**, Allameh Helli High School — 2015 – 2016 and Fall 2019
  Taught algorithms and data structures to students preparing for the Iranian National Olympiad in Informatics (INOI).

Volunteer Activities

- **Member of the Scientific Committee** of National Programming Contests
  Designed programming contests and authored algorithmic problems.
  - West Asia ACM ICPC Regional Contest — 2018 – 2019
  - Iran's IOI Team Selection Exams — 2016 – 2019
  - INOI Summer Camp Exams — 2015 – 2017 and 2024
- **Task Preparation System** for **IOI 2017** [Technical Report, GitHub] — 2016 – 2017
  Developed a system used by the Scientific Committee for preparing IOI tasks. Used at IOI 2017 and 2019.
- **Executive Director** of the **3rd Winter Seminar Series (WSS)** at Sharif University of Tech. — Fall 2017
  A four-day event including 28 talks and 7 workshops in computer science and engineering with nearly 400 participants.