Vahid Balazadeh

University of Toronto
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Research Interests

My research focus lies in understanding the concepts and mechanisms to support optimal decision making, particularly in applications where simulation is costly or infeasible. To this end, I work on causal inference from observational data and its intersection with machine learning, as well as imitation learning and reinforcement learning from offline observations.

Education

PhD Direct-Entry in Computer Science Sep. 2021 – Nov. 2026 (Exp.)
University of Toronto. Supervised by: Rahul G. Krishnan Toronto, Canada
Thesis: Learning data-driven algorithms for causal decision making

B.Sc. in Computer Engineering and Mathematics (Double Major) Sep. 2015 – Sep. 2020
Sharif University of Technology Tehran, Iran

Professional Experience

Google DeepMind Mar. 2026 – Aug. 2026
Student Researcher Toronto, Canada

Autodesk May 2024 – Nov. 2024
Machine Learning Research Intern Toronto, Canada

- Designed and implemented a modular framework to improve vision-language models for intuitive physical understanding. Published at ICCV 2025.

University of Toronto & Vector Institute Sep. 2021 – Present
Graduate Student Researcher Toronto, Canada

- Developed CausalPFN, an in-context learning method for causal effect estimation, achieving state-of-the-art performance on benchmark datasets.
- Developed generative models for causal structure discovery and partial identification of causal effects.
- Developed an algorithm for imitation learning from experts with privileged information.
- Taught a graduate-level course on Introduction to Causality.
- Gave a lecture on the potential outcome framework and causal effect estimation to data scientists from companies such as Air Canada, Bell, CIBC, Deloitte, RBC, Shopify, etc.

Cafe Bazaar Nov. 2020 – Jul. 2021
Data Scientist at Video Team Tehran, Iran

- Worked on optimizing video watch time by automating mid-roll ad breaks and deployed a speech recognition model in PyTorch, resulting in a $\sim 10\%$ increase in watch time.

Max Planck Institute for Software Systems Jul. 2019 – Sep. 2019
Research Internship Kaiserslautern, Germany

- Developed a novel algorithm for optimal decision-making policies in multi-agent systems.

Key Publications

1. **V. Balazadeh***, H. Kamkari*, V. Thomas, B. Li, J. Ma, J. Cresswell, R. Krishnan. "CausalPFN: Amortized Causal Effect Estimation via In-Context Learning," *NeurIPS*, 2025 (**Spotlight, top 3%**).
2. **V. Balazadeh**, M. Ataei, H. Cheong, A. Khasahmadi, R. Krishnan. "Physics Context Builders: A Modular Framework for Physical Reasoning in Vision-Language Models," *ICCV*, 2025.
3. **V. Balazadeh**, K. Chidambaram, V. Nguyen, R. Krishnan*, V. Syrgkanis*. "Sequential Decision Making with Expert Demonstrations under Unobserved Heterogeneity," *NeurIPS*, 2024.
4. A. Lau, Y. Choi, **V. Balazadeh**, K. Chidambaram, V. Syrgkanis, R. Krishnan. "Personalized Adaptation via In-Context Preference Learning," *NeurIPS Workshop on Adaptive Foundation Models*, 2024.
5. **V. Balazadeh**, V. Syrgkanis, R. Krishnan. "Partial Identification of Treatment Effects with Implicit Generative Models," *NeurIPS*, 2022.
6. **V. Balazadeh**, A. De, A. Singla, M. Gomez-Rodriguez. "Learning to Switch Among Agents in a Team via 2-Layer Markov Decision Processes," *Transactions on Machine Learning Research*, 2022.

Technical Skills

- **Programming Languages**: Python, R, JavaScript, Mathematica
- **ML/AI Frameworks**: PyTorch, JAX, Hugging Face Transformers, DeepSpeed, scikit-learn, XGBoost
- **Cloud & MLOps**: AWS (EC2), Docker, Weights & Biases
- **Others**: PySpark, Pandas, NumPy, Git, CI/CD pipelines, Jupyter

Awards & Leadership

- Samit & Reshma Sharma Scholarship in Computer & Data Science, University of Toronto 2026
- C.C. Gotlieb (Kelly) Graduate Fellowship, University of Toronto 2025
- Co-organized a MLHC 2024 Workshop on Red Teaming LLMs in Healthcare Applications 2024
- Computer Science 50th Anniversary Graduate Scholarship, University of Toronto 2024
- NeurIPS 2022 Scholar Award 2022
- Vector Research Grant 2021 –2026
- MPI-SWS Summer Scholarship 2019
- Ranked 3$^{\text{rd}}$ among 180,000+ participants in Iranian University Entrance Exam 2015

Talks

- In-Context Learning for Causal Effect Estimation, **ACM SIGKDD** UDM Workshop, Toronto 2025
- In-Context Learning for Causal Effect Estimation, **Stanford University**, Remote 2025
- Partial Identification of Treatment Effects, **Imperial College London**, Remote 2023
- Causal Effect Estimation and Potential Outcomes, **Vector Institute**, Toronto, Canada 2023
- Partial Identification of Treatment Effects, **NeurIPS**, Remote 2022
- Learning to Switch Between Humans and Machines, **Georgia Tech**, Remote 2021

Service

- **Reviewer**: AAAI, CHILL, ML4H, NeurIPS (2022–2025), ICLR, CVPR, TMLR, and Gold reviewer for ICML 2026.