Mohammad Hossein Moslemi

GitHub: mhmoslemi2338
LinkedIn: mohammad-hosein-moslemi

226-998-5260
mohammad.moslemi@uwo.ca
London, ON, Canada

Research Summary

Ph.D. student working on trustworthy machine learning, with research interests in distributionally robust optimization, statistical learning, and causality. I focus on developing methods with guarantees for fairness and reliability across different applications.

Education

Aug. 2025 – Present **Ph.D. in Computer Science**
Western University & Ivey Business School, Canada
Supervisor: Dr. Boyu Wang (Vector Institute Affiliate)
Co-Supervisor: Dr. Bissan Ghaddar (Ivey Business School)

Sep. 2023 – Apr. 2025 **MSc in Computer Science**
Western University, Canada
Thesis: *Fairness in Entity Matching and Blocking*
Supervisor: Dr. Mostafa Milani

Sep. 2018 – Sep. 2023 **BSc in Electrical Engineering**
Sharif University of Technology, Tehran, Iran
Thesis: *Lung Tissue Classification via Graph Signal Processing on CT Scans*
Supervisor: Dr. Arash Amini

Research Experience

Machine Learning Researcher Aug. 2023 – Present
Western University

- Investigated **long-horizon time-series forecasting** by analyzing causal relations through Granger causality, VAR models, and transformer architectures. Explored adjustments to attention mechanisms motivated by causal constraints; the project was discontinued after empirical limitations were observed.
- Working at the intersection of **trustworthy ML** and **dataset distillation**. Currently developing generalization and fairness bounds based on **PAC-Bayesian theory** and **domain adaptation**. Extending this framework to characterize and improve fairness after distillation and to design algorithms that preserve both predictive performance and group-level fairness guarantees.

Fairness & Causality via Optimal Transport Sep. 2023 – May 2025
Western University & UC San Diego

- Designed and implemented optimal transport–based frameworks for **bias removal** and **conditional independence restoration** in datasets, using the Sinkhorn algorithm.
- Led the development of a post-processing method that aligns classification score distributions across groups to reduce bias while preserving accuracy, and contributed to two papers accepted at Proceedings of the **ACM on Management of Data (SIGMOD) 2024.**
- Formalized the fair classification problem and developed an optimal transport based framework with algorithms addressing demographic parity and equalized odds constraints.

Fairness & Robustness in Record Linkage Apr. 2024 – Dec. 2024
Western University

- Led research on the fairness and stability of record-linkage systems, establishing a formal link between **blocking mechanisms** and **clustering bias**.
- Defined new fairness metrics and demonstrated systematic biases in existing benchmarks and downstream entity-matching tasks; published findings at **IEEE BigData 2024**.
- Conducted controlled experiments on heterogeneous datasets, analyzing how **noise, missing data, synonyms** (via BERT), and hierarchical structures degrade linkage accuracy.

Publications

Conference

C1. **Moslemi, M. H.**, Balamurugan, H. & Milani, M. Evaluating Blocking Biases in Entity Matching. *IEEE International Conference on Big Data **(IEEE BigData)*** (2024).

C2. **Moslemi, M. H.** & Milani, M. Threshold-Independent Fair Matching through Score Calibration. *Proceedings of the ACM on Management of Data **(SIGMOD)**, Workshop on Governance, Understanding and Responsibility for AI*, 40–44 (2024).

C3. Pirhadi, A., **Moslemi, M. H.**, Cloninger, A., Milani, M. & Salimi, B. OTClean: Data Cleaning for Conditional Independence Violations Using Optimal Transport. *Proceedings of the ACM on Management of Data **(SIGMOD)*** **2,** 1–26 (2024).

Under Review

S1. **Moslemi, M. H.**, Mousavi, A., Behkamal, B. & Milani, M. Entity Matching and Data Heterogeneity: Survey and Experimental Analysis. *Under review at Data & Knowledge Engineering Journal.*

S2. **Moslemi, M. H.**, Omati, M. M. & Amini, A. Lung Tissue Classification for ILD Patients Using Graph Signal Processing. *Under review at IEEE Transactions on Medical Imaging.*

Professional Service

Reviewer, **AISTATS 2026**

Honors and Awards

2025 **Doctoral Excellence Scholarship** (CAD 160,000), Western University
2025 Master's thesis received an **Exceptional Evaluation**
2023 Ranked in the **Top 10%** of the Electrical Engineering class, Sharif University
2023 **Astonishing Achievement Award** for BSc Project
2017 **Bronze Medal**, Iran National Physics Olympiad