Hirad Daneshvar

Postdoctoral Research Fellow @ INRS-UQO UMR Lab

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SUMMARY

Postdoctoral Research Fellow at INRS-UQO researching misinformation and disinformation among underrepresented groups in AI. Ph.D. in Computer Engineering (Toronto Metropolitan University, 2025) focused on trustworthy deep learning in healthcare, including mental health prediction, model calibration, and uncertainty quantification. Led the development of a trustworthy AI triage agent during my Ph.D. M.Sc. in Computer Engineering (2020), specializing in recommendation systems. 5+ years of development experience (Python, PHP, JavaScript, SQL/NoSQL). **Interests:** recommendation systems, applied deep learning, and trustworthy AI. ***Note:*** Permanent Resident of Canada; open to relocation.

SKILLS & LANGUAGES

Python, PyTorch, Scikit-Learn, Pandas, Numpy, Graph Neural Networks, Machine Learning, Deep Learning, Recommendation Systems, SQL, MongoDB, NoSQL, C++ (Basic), Java, Git, Docker, Applied Research, Attention to detail, Strong communication skills, Highly collaborative, Critical thinking, Problem-solving, Adaptability, English (Fluent), Persian (Native), French (Basic)

WORK EXPERIENCE

INRS-UQO UMR Research Lab — **Gatineau, QC, Canada**

Postdoctoral Research Fellow — Sep 2025 - Present

- Member of the Multisensory Signal Analysis and Enhancement (MuSAE) lab at the INRS-UQO joint research unit.
- Conducting research on mis/disinformation among underrepresented groups with a focus on Artificial Intelligence's contributions.

Toronto Metropolitan University — **Toronto, ON, Canada**

Research Assistant — Jan 2021 - Sep 2025

- Conducted research on Applications of Deep Learning in Mental Health.
- Conducted research on Trustworthy Graph Neural Networks, confidence calibration and uncertainty quantification, and utilizing heterogeneous data from multiple sources.
- Developed an AI solution in Python (PyTorch) for mental health service utilization.
- Led master's students for research on developing a trustworthy AI agent for mental health triaging.

Payrad Smart Solutions **Tehran, Iran**

Software Developer Jul 2020 - Mar 2021

- Developed databases using MySQL in a FinTech-related startup.
- Developed and maintained web applications back-end using PHP/NodeJS and the Laravel/NestJS Framework to help speed up wage payments.
- Developed a subsystem for a freight and logistics management system.

Fanap Plus **Tehran, Iran**

Software Developer & Team Lead Sep 2018 - Jul 2020

- Served as web development team lead.
- Developed databases using MySQL and MongoDB.
- Developed and maintained web applications back-end using PHP and the Laravel Framework.
- Developed and maintained web applications related to soccer match prediction and mobile top-up purchases.

Noghtechin Studio **Tehran, Iran**

Freelance Software Developer Apr 2018 - Sep 2020

- Analyzed, designed, developed and maintained web applications back-end using PHP (Yii 2.x and Laravel Frameworks) and Python (Flask Framework for Rest APIs).
- Developed Databases Using MySQL, MongoDB, and PostgreSQL.
- Developed solutions for small startups in on-demand learning platforms, e-commerce systems, etc.

Mandegar System **Tehran, Iran**

Software Developer Jul 2013 - Apr 2018

- Analyzed, designed, developed and maintained web applications back-end using PHP, Yii Framework.
- Developed databases using MySQL and MongoDB.
- Designed and developed an e-commerce system with features such as dynamic product fields.

EDUCATION

Toronto Metropolitan University **Toronto, ON, Canada**

Ph.D. *in* ***Computer Engineering*** Jan 2021 - Oct 2025

Member of Trustworthy AI Research Lab (TAILab), **Dissertation:** Trustworthy Graph Neural Networks for Healthcare Predictive Modelling

Islamic Azad University - Central Tehran Branch **Tehran, Iran**

M.Sc. *in* ***Computer Engineering*** Sep 2016 - Sep 2020

Thesis: A Social Hybrid Recommendation System using LSTM and CNN (Published Paper)

Islamic Azad University - Central Tehran Branch **Tehran, Iran**

BS *in* ***Computer Engineering*** Sep 2010 - Jan 2016

Project: Design and Development of an Online Learning System

TEACHING EXPERIENCE

Toronto Metropolitan University — **Toronto, ON, Canada**

Contract Lecturer — May 2024 - Jul 2025

- Software Design and Architecture Course (COE692) - Teaching different architectural styles
- Software Systems Course (COE318) - Teaching OOP in Java

Carleton University — **Ottawa, ON, Canada**

Contract Instructor — Sep 2024 - Dec 2024

- Web and Mobile Software Development Course (EGEN 5206) - Teaching JavaScript for back-end, front-end, mobile and MongoDB

Toronto Metropolitan University — **Toronto, ON, Canada**

Teaching Assistant — Sep 2021 - Apr 2024

- Software Systems Lab (COE318)
- Algorithms and Data Structures Lab (COE428)

ACADEMIC RESEARCH & PROJECTS

[P5] **Deep Learning Models in Mental Health Service Utilization:** A deep learning approach to use data from multiple sources for early prediction of mental health emergency department visits (*Sep 2025*)

[P4] **Ontology Alignment**: Design and implementation of an ontology alignment system using Graph AutoEncoder and multiple classifiers, implemented in Python and Pytorch (Intelligent Systems Course Project) - Link (*Apr 2022*)

[P3] **Hybrid Movie Recommendation System**: Design and implementation of a movie recommendation system using AutoEncoder, K-Means Clustering, and KD-Tree, implemented in Python and Pytorch (Knowledge Discovery Course Project) - Link (*Dec 2021*)

[P2] **Movie Recommendation System**: Developed a hybrid movie recommendation system using LSTM and CNN in Python and PyTorch. The system used the user's rating history and the movie's information, including the movie poster. User's social impact was incorporated in the training (M.Sc. thesis) - Paper (*Sep 2020*)

[P1] **Online Learning System**: Design, implementation and database development of an online learning system. Implemented in PHP (Yii Framework) and MySQL (BSc final project) (*Jan 2016*)

PUBLICATIONS

Journal Papers and Book Chapters

[JB3] **Daneshvar, H.**, Boursalie, O., Samavi, R., Doyle, T. E., Duncan, L., Pires, P., & Sassi, R. (2024). SOK: Application of machine learning models in child and youth mental health decision-making. *Artificial Intelligence for Medicine*, 113-132. (Link)

[JB2] Saggu, S., **Daneshvar, H.**, Samavi, R., Pires, P., Sassi, R. B., Doyle, T. E., ... & Duncan, L. (2024). Prediction of emergency department revisits among child and youth mental health outpatients using deep learning techniques. *BMC medical informatics and decision making*, 24(1), 42. (Link)

[JB1] **Daneshvar, H.**, & Ravanmehr, R. (2022). A social hybrid recommendation system using LSTM and CNN. *Concurrency and Computation: Practice and Experience*, 34(18), e7015. (Link)

Peer-Reviewed Conference Papers

[C3] **Daneshvar, H.**, & Samavi, R. (2025, August). GNN's Uncertainty Quantification Using Self-distillation. In *International Conference on AI in Healthcare* (pp. 31-45). Cham: Springer Nature Switzerland. (Link)

[C2] **Daneshvar, H.**, & Samavi, R. (2024). GCE: Confidence Calibration Error for Improved Trustworthiness of Graph Neural Networks. *Proceedings of the Canadian Conference on Artificial Intelligence*. (Link)

[C1] **Daneshvar, H.**, & Samavi, R. (2022). Heterogeneous Patient Graph Embedding in Readmission Prediction. *Proceedings of the Canadian Conference on Artificial Intelligence*. (Link)

Accepted Papers

[A1] **Daneshvar, H.**, & Samavi, R. (2025). Efficient Subsampling for GNN Downstream Tasks. Proceedings of the 17th Asian Conference on Machine Learning.

PRESENTATIONS & ABSTRACTS

[PA11] Bonert M., Ho E., Wang F., **Daneshvar H.**, Naqvi A. (Sep 2025). Utilizing the report structure when extracting information from free text reports via natural language processing and an open large language model. *European Congress of Pathology*, Vienna, Austria.

[PA10] **Daneshvar, H.** and Samavi, R. (Jul 2025). GNN's Uncertainty Quantification using Self-Distillation. *Vector Institute ML Privacy and Security Workshop*, Toronto, ON, Canada.

[PA9] **Daneshvar, H.** and Samavi, R. (Mar 2025). Uncertainty Quantification in Graph Neural Networks. *Vector Institute Research Symposium Poster Presentation (Remarkable 2025)*, Toronto, ON, Canada.

[PA8] **Daneshvar, H.** (Dec 2024). Trustworthy Graph Neural Networks. *McMaster University CSE Seminar*, Hamilton, ON, Canada.

[PA7] **Daneshvar, H.** and Samavi, R. (Jul 2024). GCE: Confidence Calibration Error for Improved Trustworthiness of GNNs. *Vector Institute ML Security & Privacy Workshop*, Toronto, ON, Canada.

[PA6] **Daneshvar H.**, Zhao J., Mauluddin A., Duncan L., Pires P., Sassi R., Samavi R., Doyle T. (Jun 2024). Graph Data Fusion to Predict Emergency Department Visit within 180-Days. *Precision Child and Youth Mental Health Conference*, Ottawa, ON, Canada.

[PA5] **Daneshvar H.**, Saggu, S., Zhao J., Mauluddin A., Duncan L., Pires P., Sassi R., Samavi R., Doyle T. (Jun 2024). GNN in 30-Day ED Prediction for Child/Youth. *Precision Child and Youth Mental Health Conference*, Ottawa, ON, Canada.

[PA4] **Daneshvar H.**, Samavi R. (Feb 2024). Confidence Calibration Loss for Graph Neural Networks. *Vector Institute Research Symposium Poster Presentation (Remarkable 2024)*, Toronto, ON, Canada.

[PA3] **Daneshvar H.**, Rashidiani S., Zhao J., Mauluddin A., Boursalie O., Duncan L., Pires P., Sassi R., Samavi R., Doyle T. (Oct 2023). Predicting Child and Youth Mental Health Service Use with Deep Learning Models. *Canadian Psychiatric Association Annual Conference*, Vancouver, BC, Canada.

[PA2] **Daneshvar H.**, Samavi R. (Feb 2023). Questionnaire Graph Embedding for Early Prediction of Mental Health Emergency Department Admission. *Vector Institute Research Symposium Poster Presentation*, Toronto, ON, Canada.

[PA1] **Daneshvar H.**, Samavi R. (Feb 2022). Using Graph Neural Networks in Mental Health Service Utilization. *Vector Institute Research Symposium Poster Presentation*, Toronto, ON, Canada.