Hirad **Daneshvar**

Ph.D. Candidate in Computer Engineering

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Summary

I am a Research Assistant (Ph.D. Candidate in Computer Engineering) at Toronto Metropolitan University with 5+ years of software engineering, database design & development, programming, and applied machine learning experience. I have been working on applications of Deep Learning in Healthcare as part of the Trustworthy AI Lab (TAILab). More specifically, I am focusing on mental health outcome prediction using Deep Learning, working closely with researchers from McMaster University and clinicians/experts from both Hamilton Health Sciences (HHS) and the University of British Columbia (UBC). I have also worked on calibrating and quantifying the model's prediction uncertainty. **Note:** I am a permanent resident (PR) of Canada and do not require any sponsorship or work authorization. I am open to relocation.

Skills and Languages

- Python
- PyTorch
- Scikit-Learn
- Pandas
- Graph Neural Networks
- Numpy
- C++ (Basic)
- Java
- SQL
- MongoDB
- NoSQL
- Recommendation Systems
- Machine Learning
- Deep Learning
- Applied Research
- Git
- English Language (Fluent)
- French Language (Basic)
- Persian (Native)

Work Experience

Toronto Metropolitan University

Toronto, ON, Canada

Research Assistant (Ph.D. Candidate)

Jan. 2021 - Current

- Conducting research on Applications of Deep Learning in Mental Health.
- Conducting research on Graph Neural Networks and their applications, especially in the healthcare domain.
- Conducting research on confidence calibration and uncertainty quantification of deep learning classifiers.
- Conducting research on utilizing heterogeneous data from multiple sources.
- Developing an AI solution in Python (PyTorch) for mental health service utilization.

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 Laravel Framework.
- Developed and maintained web applications related to soccer match prediction and mobile top-up purchases.

Noghtechin Studio

Tehran, Iran

Software Developer (Freelance)

Apr. 2018 - Sep. 2020

- Analysed, 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

- Analysed, 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 (GPA: 3.92 Out of 4.33)

Jan. 2021 - Present (June 2025)

- Member of Trustworthy AI Research Lab (TAILab)
- Research Focus: Applied Deep Learning in Mental Health Outcome Prediction, Collaborating with Hamilton Health Sciences (HHS)

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

M.Sc. in Computer Engineering (GPA: 17.70 Out of 20) — *Sep. 2016 - Sep. 2020*

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

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

BS in Computer Engineering (GPA: 17.28 Out of 20) — *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 - current*

- 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 — *Sept. 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). (Fall 2023, Fall 2022, Fall 2021)
- Algorithms and Data Structures Lab (COE428). (Winter 2024, Spring/Summer 2023, Winter 2023, Spring/Summer 202, Winter 2022)

Academic Research & Projects

Current Research	**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
Apr. 2022	**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
Dec. 2021	**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
Jan. 2016	**Online Learning System**, Design, implementation and database development of an online learning system. Implemented in Php (Yii Framework) and MySQL (BSc final project)

Publications

Journal Papers and Book Chapters

2024 **Daneshvar H., Boursalie O., Samavi R., Doyle T., Duncan L., Pires P., Sassi R.**, "SOK: Application of Machine Learning Models in Child and Youth Mental Health Decision-Making" Artificial Intelligence for Medicine Link to Paper.

2024 **Saggu, S., Daneshvar, H., Samavi, R., Pires, P., Sassi, R.B., Doyle, T.E., Zhao, J., Mauluddin, A., Duncan, L.**, "Prediction of Emergency Department Revisits among Child and Youth Mental Health Outpatients Using Deep Learning Techniques" BMC Medical Informatics and Decision Making Link to Paper.

2022 **Daneshvar H. and Ravanmehr R.**, "A Social Hybrid Recommendation System using LSTM and CNN" Concurrency and Computation: Practice and Experience Link to Paper.

Reviewed Conferences

2024 **Daneshvar, H. and Samavi, R.**, "GCE: Confidence Calibration Error for ImprovedTrustworthiness of Graph Neural Networks" Proceedings of the Canadian Conference on Artificial Intelligence Link to Paper, Link to Code.

2022 **Daneshvar, H. and Samavi, R.**, "Heterogeneous Patient Graph Embedding in Readmission Prediction" Proceedings of the Canadian Conference on Artificial Intelligence Link to Paper, Link to Presentation.

Accepted

2025 **Daneshvar, H. and Samavi, R.**, "GNN's Uncertainty Quantification using Self-Distillation" International Conference on AI in Healthcare 2025

Presentations & Abstracts

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

Dec. 2024 **Daneshvar, H.**, ”Trustworthy Graph Neural Networks” McMaster University CSE Seminar, Hamilton, ON, Canada

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

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

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

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

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

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

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