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, programming experience, 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 worked on the calibration and uncertainty quantification of the model. **Note:** I am a permanent resident (PR) of Canada, and I do not require any sponsorship or work authorizations.

Skills and Languages

- Python
- PyTorch
- PyTorch Geometric
- JavaScript
- Java (Basic)
- C++ (Basic)
- SQL
- MongoDB
- MySQL
- NoSQL
- Git
- Recommendation Systems
- Machine Learning
- Deep Learning
- Applied Research
- 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 (May 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

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

Reviewed Conference Proceedings

GCE: Confidence Calibration Error for Improved Trustworthiness of Graph Neural Networks — *Guelph, ON, Canada*

Presented at the <Canadian Conference on Artificial Intelligence> — *May 2024*

- Authors: Daneshvar H., Samavi R.
- Conference Proceedings: Hirad Daneshvar and Reza Samavi. "GCE: Confidence Calibration Error for ImprovedTrustworthiness of Graph Neural Networks" Proceedings of the 37th Canadian Conference on Artificial Intelligence, May 27, 2024 (Link)

Heterogeneous Patient Graph Embedding in Readmission Prediction — *Toronto, ON, Canada*

Presented at the <Canadian Conference on Artificial Intelligence> — *Jun. 2022*

- Authors: Daneshvar H., Samavi R.
- Link to Talk: Link.
- Conference Proceedings: Hirad Daneshvar and Reza Samavi. "Heterogeneous Patient Graph Embedding in Readmission Prediction" Proceedings of the 35th Canadian Conference on Artificial Intelligence, May 27, 2022 (Link)

Presentations

Uncertainty Quantification in Graph Neural Networks — *Toronto, ON, Canada*

Presented at <Vector Institute Research Symposium Poster Presentation (Remarkable 2025)> — *Mar. 2025*

- Authors: Daneshvar H., Samavi R.

GCE: Confidence Calibration Error for Improved Trustworthiness of GNNs — *Toronto, ON, Canada*

Presented at <Vector Institute ML Security & Privacy Workshop> — *Jul. 2024*

- Authors: Daneshvar H., Samavi R.

Graph Data Fusion to Predict Emergency Department Visit within 180-Days — *Ottawa, ON, Canada*

Presented at <Precision Child and Youth Mental Health Conference> — *Jun. 2024*

- Authors: Daneshvar H., Zhao J., Mauluddin A., Duncan L., Pires P., Sassi R., Samavi R., Doyle T.

GNN in 30-Day ED Prediction for Child/Youth — *Ottawa, ON, Canada*

Presented at <Precision Child and Youth Mental Health Conference> — *Jun. 2024*

- Authors: Daneshvar H., Saggu, S., Zhao J., Mauluddin A., Duncan L., Pires P., Sassi R., Samavi R., Doyle T.

Confidence Calibration Loss for Graph Neural Networks — *Toronto, ON, Canada*

Presented at <Vector Institute Research Symposium Poster Presentation (Remarkable 2024)> — *Feb. 2024*

- Authors: Daneshvar H., Samavi R.

Predicting Child and Youth Mental Health Service Use with Deep Learning Models — *Vancouver, BC, Canada*

Presented at <Canadian Psychiatric Association Annual Conference> — *Oct. 2023*

- Authors: Daneshvar H., Rashidiani S., Zhao J., Mauluddin A., Boursalie O., Duncan L., Pires P., Sassi R., Samavi R., Doyle T.

Questionnaire Graph Embedding for Early Prediction of Mental Health Emergency Department Admission — *Toronto, ON, Canada*

Presented at <Vector Institute Research Symposium Poster Presentation> — *Feb. 2023*

- Authors: Daneshvar H., Samavi R.

Using Graph Neural Networks in Mental Health Service Utilization — *Toronto, ON, Canada*

Presented at <Vector Institute Research Symposium Poster Presentation> — *Feb. 2022*

- Authors: Daneshvar H., Samavi R.