

Hirad Daneshvar

PH.D. CANDIDATE IN COMPUTER ENGINEERING

Ottawa, ON, Canada

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

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

M.SC. IN COMPUTER ENGINEERING (GPA: 17.70 OUT OF 20)

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

Tehran, Iran

Sep. 2016 - Sep. 2020

Islamic Azad University - Central Tehran Branch

BS IN COMPUTER ENGINEERING (GPA: 17.28 OUT OF 20)

- Project: Design and Development of an Online Learning System

Tehran, Iran

Sep. 2010 - Jan. 2016

Teaching Experience

Toronto Metropolitan University

CONTRACT LECTURER

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

Toronto, ON, Canada

May 2024 - current

Carleton University

CONTRACT INSTRUCTOR

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

Ottawa, ON, Canada

Sept. 2024 - Dec. 2024

Toronto Metropolitan University

TEACHING ASSISTANT

- 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 2022, Winter 2022)

Toronto, ON, Canada

Sep. 2021 - Apr. 2024

Academic Research & Projects

- Current **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

PRESENTED AT THE <CANADIAN CONFERENCE ON ARTIFICIAL INTELLIGENCE>

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

Guelph, ON, Canada

May 2024

Heterogeneous Patient Graph Embedding in Readmission Prediction

PRESENTED AT THE <CANADIAN CONFERENCE ON ARTIFICIAL INTELLIGENCE>

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

Toronto, ON, Canada

Jun. 2022

Presentations

Uncertainty Quantification in Graph Neural Networks PRESENTED AT <VECTOR INSTITUTE RESEARCH SYMPOSIUM POSTER PRESENTATION (REMARKABLE 2025)> • Authors: Daneshvar H., Samavi R.	<i>Toronto, ON, Canada</i> <i>Mar. 2025</i>
GCE: Confidence Calibration Error for Improved Trustworthiness of GNNs PRESENTED AT <VECTOR INSTITUTE ML SECURITY & PRIVACY WORKSHOP> • Authors: Daneshvar H., Samavi R.	<i>Toronto, ON, Canada</i> <i>Jul. 2024</i>
Graph Data Fusion to Predict Emergency Department Visit within 180-Days PRESENTED AT <PRECISION CHILD AND YOUTH MENTAL HEALTH CONFERENCE> • Authors: Daneshvar H., Zhao J., Mauluddin A., Duncan L., Pires P., Sassi R., Samavi R., Doyle T.	<i>Ottawa, ON, Canada</i> <i>Jun. 2024</i>
GNN in 30-Day ED Prediction for Child/Youth PRESENTED AT <PRECISION CHILD AND YOUTH MENTAL HEALTH CONFERENCE> • Authors: Daneshvar H., Saggu, S., Zhao J., Mauluddin A., Duncan L., Pires P., Sassi R., Samavi R., Doyle T.	<i>Ottawa, ON, Canada</i> <i>Jun. 2024</i>
Confidence Calibration Loss for Graph Neural Networks PRESENTED AT <VECTOR INSTITUTE RESEARCH SYMPOSIUM POSTER PRESENTATION (REMARKABLE 2024)> • Authors: Daneshvar H., Samavi R.	<i>Toronto, ON, Canada</i> <i>Feb. 2024</i>
Predicting Child and Youth Mental Health Service Use with Deep Learning Models PRESENTED AT <CANADIAN PSYCHIATRIC ASSOCIATION ANNUAL CONFERENCE> • Authors: Daneshvar H., Rashidiani S., Zhao J., Mauluddin A., Boursalie O., Duncan L., Pires P., Sassi R., Samavi R., Doyle T.	<i>Vancouver, BC, Canada</i> <i>Oct. 2023</i>
Questionnaire Graph Embedding for Early Prediction of Mental Health Emergency Department Admission PRESENTED AT <VECTOR INSTITUTE RESEARCH SYMPOSIUM POSTER PRESENTATION> • Authors: Daneshvar H., Samavi R.	<i>Toronto, ON, Canada</i> <i>Feb. 2023</i>
Using Graph Neural Networks in Mental Health Service Utilization PRESENTED AT <VECTOR INSTITUTE RESEARCH SYMPOSIUM POSTER PRESENTATION> • Authors: Daneshvar H., Samavi R.	<i>Toronto, ON, Canada</i> <i>Feb. 2022</i>