Faraz Khoshbakhtian

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EDUCATION

Ph.D., Industrial engineering, University of Toronto, Expected defense in 2024 (Current GPA: 4.0)
Thesis: Reinforcement learning for a generalized and scalable solutions to the critical node detection problem, with applications to pandemic vaccination strategies
Supervisor: Dionne M. Aleman, Ph.D.

H.B.Sc., University of Toronto, 2020 (Cumulative GPA 3.7)
Concentrations: Computer Science, Statistics, and Philosophy

Areas of expertise

Analysis and interpretability for machine learning; reinforcement learning; graph theory; deep neural networks; and distributed computing.

Publications

Published

[1] Khan, S. S., Khoshbakhtian, F., and Ashraf, A. B. (2021). Anomaly detection approach to identify early cases in a pandemic using chest X-rays. *Proceedings of the Canadian Conference on Artificial Intelligence*. 2021. doi: 10.1155/2021/5528144

In-progress

[2] Khoshbakhtian, F., Lagman, A., Aleman, D. M., Giffen, R., and Rahman, P. (2021). Prediction of severe COVID-19 infection at the time of testing: A machine learning approach. *targeted for Canadian Medical Association Journal.*

[3] Navabzadeh, F., Khoshbakhtian, F., Aleman, D. M., Giffen, R., and Rahman, P. Machine learning to predict clinical outcomes of psoriasis patients. *targeted for Canadian Medical Association Journal.*

Pre-prints

[1] Khoshbakhtian, F., Lagman, A., Aleman, D. M., Giffen, R., and Rahman, P. (2021). Prediction of severe COVID-19 infection at the time of testing: A machine learning approach. medRxiv. doi:10.1101/2021.10.15.21264970v1.

Conference and workshop presentations

[1] Pirmorad, E., Khoshbakhtian, F., Mansouri, F., and Farahmand, A. M. Deep reinforcement learning for online control of stochastic partial differential equations. Spotlight presentation at *The Symbiosis of Deep Learning and Differential Equations*. virtual. Dec 2021.

[2] Khoshbaktian, F. Machine learning for early detection of severe COVID infection. Oral presentation at *University of Toronto Engineering Research Conference (UTERC)*. virtual, Canada. July 2021.

[3] Navabzadeh, F., Khoshbakhtian, F., Aleman, D. M., Giffen, R., and Rahman, P. Machine learning to predict clinical outcomes of psoriasis patients (*invited presentation*). INFORMS Healthcare Conference. virtual, Canada. July 2021

Teaching experience

- **Teaching assistant, University of Toronto, 2018-present**
  - Courses: Fundamentals of Object-Oriented Programming (MIE250); Data Modelling (MIE253); Introduction to Philosophy (PHL101)
  - Responsibilities: Preparing tutorial material, holding office hours, designing and marking assignments and exams.

Professional experience

- **Data scientist, RBC, Summer 2021**

Designed, implemented, and validated climate analytics tools using interpretable machine learning and statistics.

- **Data scientist and software developer, Ctrl Designer, 2017-2020**

Applied machine learning in software development to optimize and automate industrial processes.

- **Developer and curriculum writer, Code at the Edge, 2018-2019**

Developed an offline coding playground and a teaching curriculum for web development workshops in underdeveloped areas with low access to internet.

- **Department assistant, Department of Philosophy, University of Toronto, Summer 2018**

Created departmental placement record document and assisted everyday business of running the department.

- **Research assistant, Scholars in Residence, University of Toronto, Summer 2017**

Intensive research project on China's cultural revolution and its effects on the marginalized population supervised by Dr. Yiching Wu.

Leadership and service

- **Co-Director, Marketing Team**, ILead:Grad, University of Toronto Faculty of Applied Science & Engineering, 2020-2021
- **Co-Lead, Design Team**, Cyrus International Film Festival of Toronto, 2016-2018
- **Workshop Facilitator, Research Officer**, InDepth Conference at the Munk School of Global Affairs, 2016-2017

Technical skills

Python, Java, C++, Julia; database management systems; computer science and machine learning theory; neural network applications and interpretability; cloud computing; distributed computing

Awards

- Faculty of Applied Science & Engineering Graduate Student Endowment Award ($3000) (2020)
- Woodsworth College Brookfield's Leadership Scholarship ($6000) (2018)
- Jackman Humanities Scholars in Residence Scholarship ($1500) (2017)
- Sam & Mary Restivo Family Admission Scholarship ($1200) (2015)