# MOHAMMAD NOAEEN

Postdoctoral Fellow, Dalla Lana School of Public Health, University of Toronto m.noaeen@utoronto.ca

#### RESEARCH INTERESTS

- Health Informatics, Public Health, Environmental Health, Health and Environmental Equity.
- Intelligent Transportation Systems, Traffic Flow Modelling, Ethics in AI & Autonomous Machines.
- Social Media Analysis, Large Language Models, Machine Learning, AI.

# **EDUCATION**

#### University of Toronto, Canada

Jun 2024 - Present (until May 2025)

Postdoctoral Research Fellow – in Health Data Science

Data Science Institute: https://datasciences.utoronto.ca/

Institute of Health Policy, Management and Evaluation, Dalla Lana School of Public Health

Supervisor: Dr. Karim Keshavjee Domain: Health Data Science

## University of Toronto, Canada

Jun 2024 - Present (until Dec 2024)

Research Scientist - in Environmental Health Science

CANUE Lab: https://canue.ca/leadership-and-staff/

Dalla Lana School of Public health Supervisor: Dr. Jeffery Brook

Domain: Health, Transportation, Geography, and Environment

#### University of Toronto, Canada

Jun 2023 - Present (until May 2025)

Research Scientist – in Health Informatics Hive Lab: https://www.hivelab-uoft.ca/

Institute of Health Policy, Management and Evaluation, Dalla Lana School of Public Health

Supervisor: Zahra Shakeri Domain: AI in Public Health

# University of Toronto, Canada

Jun 2022 - May 2024

Postdoctoral Research Fellow – in Environmental Health Science CANUE Lab: https://canue.ca/leadership-and-staff/

Dalla Lana School of Public health Supervisor: Dr. Jeffery Brook

Domain: Health, Transportation, and Environment

#### Harvard Business School, USA

Jan 2022 - May 2023

Postdoctoral Research Affiliate – in Marketing

Ethical Intelligence Lab: https://www.juliandefreitas.com/people

Department of Business Administration

Supervisor: Dr. Julian De Freitas

Domain: Ethics, Transparency, and Public Trust in Autonomous Vehicles Development

## University of Toronto, Canada

Mar 2021 - Sep 2021

Postdoctoral Research Fellow – in Transportation Engineering

https://civmin.utoronto.ca/home/about-us/directory/professors/baher-abdulhai/

Department of Civil and Mineral Engineering

Supervisors: Dr. Baher Abdulhai and Dr. Scott Sanner

Domain: AI in Traffic Signal Control

## University of Calgary, Canada

Sep 2014 - Jan 2021

Ph.D., Software Engineering

Department of Electrical and Software Engineering Supervisors: Dr. Behrouz Far and Dr. Mohsen Ramezani

https://grad.ucalgary.ca/future-students/supervisor/behrouz-far

https://www.sydney.edu.au/engineering/about/our-people/academic-staff/mohsen-ramezan

i.html

Domain: AI in Traffic Signal Control

Thesis: Managing urban traffic networks using data analysis, traffic theory, and deep reinforcement

learning

## Imam Khomeini International University, Iran

Sep 2006 - Sep 2009

M.Sc., Transportation Engineering Department of Civil Engineering Supervisor: Dr. Amir Abbas Rassafi Domain: Traffic Signal Control

Thesis: Traffic flow analysis in signalized intersections using shockwave theory

#### **PUBLICATIONS**

# Published/Accepted

- 1. Katherine Lu, Paijani Sheth, Zhi Lin Zhou, Kamyar Kazari, Aziz Guergachi, Karim Keshavjee, Mohammad Noaeen, and Zahra Shakeri Hossein Abad. "Identifying Prediabetes in Canadian Populations Using Machine Learning.", the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, Florida, USA, 2024. [Accepted]
- 2. Chelsea Tanchip, **Mohammad Noaeen**, Kamyar Kazari, Zahra Shakeri Hossein Abad. "Using Machine Learning to Predict Donor Selection for Organ Transplantation.", the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, Florida, USA, 2024. [Accepted]
- 3. Kayla Esser, Monica Duong, Khalil Kain, Son Tran, Aryan Sadeghi, Aziz Guergachi, Karim Keshavjee, **Mohammad Noaeen**, and Zahra Shakeri Hossein Abad. "Predicting Diabetes Prevalence in Canadian Adults Using Machine Learning.", the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, Florida, USA, 2024. [Accepted]
- 4. Priyonto Saha, Yacine Marouf, Hunter Pozzebon, **Mohammad Noaeen**, Aziz Guergachi, Karim Keshavjee, and Zahra Shakeri Hossein Abad. "Predicting the Time to Diabetes Onset Based on Metabolic Biomarker Levels and Comorbidities.", the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, Florida, USA, 2024. [Accepted]
- 5. Konrad Samsel, Amrit Tiwana, Sarra Ali, Aryan Sadeghi, Aziz Guergachi, Karim Keshavjee, **Mohammad Noaeen**, and Zahra Shakeri Hossein Abad. "Predicting Depression Among Canadians

- At-Risk or Living with Diabetes Using Machine Learning.", the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, Florida, USA, 2024. [Accepted]
- 6. Dany Doiron, Eleanor M Setton, Joey Syer, Andre Redivo, Allan McKee, **Mohammad Noaeen**, Priya Patel, Gillian L Booth, Michael Brauer, Daniel Fuller, Yan Kestens, Laura C Rosella, Dave Stieb, Paul Villeneuve, Jeffrey R Brook. "HealthyPlan.City: A Web Tool to Support Urban Environmental Equity and Public Health in Canadian Communities.", Journal of Urban Health, 2024 [IF = 6.6].
- 7. Mohammad Noaeen, Somayeh Amini, Shveta Bhasker, Zohreh Ghezelsefli, Aisha Ahmed, Omid Jafarinezhad, and Zahra Shakeri Hossein Abad. "Unlocking the Power of EHRs: Harnessing Unstructured Data for Machine Learning-based Outcome Predictions.", the 45th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Sydney, Australia, 2023.
- 8. Li, Xiaocan, Ray Coden Mercurius, Ayal Taitler, Xiaoyu Wang, **Mohammad Noaeen**, Scott Sanner, and Baher Abdulhai. "Perimeter Control Using Deep Reinforcement Learning: A Model-free Approach towards Homogeneous Flow Rate Optimization.", the IEEE Intelligent Transportation Systems Conference (ITSC), Bilbao, Spain, 2023.
- 9. Mohammad Noaeen, Atharva Naik, Liana Goodman, Jared Crebo, Taimoor Abrar, Zahra Shakeri Hossein Abad, Behrouz H. Far, and Ana L. C. Bazzan. "Reinforcement Learning in Urban Network Traffic Signal Control: A Systematic Literature Review.", Journal of Expert Systems With Applications, 2022 [IF = 8.5].
- 10. Mohammad Noaeen, Reza Mohajerpoor, Behrouz H. Far, and Mohsen Ramezani. "Real-time Decentralized Traffic Signal Control for Congested Urban Networks Considering Queue Spillbacks.", Journal of Transportation Research Part C: Emerging Technologies 133, 103407, 2021 [IF = 8.3].
- 11. **Mohammad Noaeen**, Behrouz H. Far, and Mohsen Ramezani. "Bi-modal Perimeter Control: A Hybrid Control Approach Integrating Proportional Integral Controller and Deep Reinforcement Learning.", Journal of IEEE Transactions on Intelligent Transportation Systems, 2021 [Preprint, IF = 6.492].
- 12. Zahra Shakeri Hossein Abad, Adrienne Kline, Madeena Sultana, **Mohammad Noaeen**, Elvira Nurmambetova, Filipe Lucini, Majed Al-Jefri, and Joon Lee. "Digital Public Health Surveillance: A Systematic Scoping Review.", NPJ digital medicine 4, no. 1, 2021: 1-13. [IF = 15.2].
- 13. **Mohammad Noaeen**, and Behrouz H. Far. "The Efficacy of Using Social Media Data for Designing Traffic Management Systems." The IEEE 28th International Requirements Engineering Conference Workshops (REW), 2020.
- Mohammad Noaeen, and Behrouz H. Far. "Social Media Analysis for Traffic Management." Proceedings of the 14th International Conference on Global Software Engineering. IEEE Press, 2019.
- 15. Mohammad Noaeen, Zahra Shakeri Hossein Abad, Guenther Ruhe, and Behrouz H. Far (2018). "Transportation Engineering on Social Question and Answer Websites: An Empirical Case Study". In Highlighting the Importance of Big Data Management and Analysis for Various Applications (pp. 117-139). Springer, Cham.
- 16. Zahra Shakeri Hossein Abad, Mohammad Noaeen, Didar Zowghi, Behrouz H. Far, and Ken Barker. "Two Sides of the Same Coin: Software Developers' Perceptions of Task Switching and Task Interruption." Proceedings of the 22nd International Conference on Evaluation and Assessment in Software Engineering 2018. ACM, 2018.

- 17. Mohammad Noaeen, Zahra Shakeri Hossein Abad, and Behrouz H. Far (2017). "Let's Hear It From RETTA: A Requirements Elicitation Tool For TrAffic Management Systems". The 35th IEEE International Conference on Requirements Engineering (RE). IEEE, Lisbon, Portugal, 2017.
- 18. Mohammad Noaeen, Amir Abbas Rassafi, and Behrouz H. Far. "Traffic Signal Timing Optimization by Modelling the Lost Time Effect in the Shock Wave Delay Model". ASCE International Conference on Transportation & Development (ICTD2016), Houston, Texas, US. American Society of Civil Engineers (ASCE), 2016.
- 19. Zahra Shakeri Hossein Abad, **Mohammad Noaeen**, and Guenther Ruhe. "Requirements Engineering Visualization: A Systematic Literature Review". In Requirements Engineering Conference (RE), 2016 IEEE 24th International (pp.6-15).
- 20. Mohammad Noaeen, Amir Abbas Rassafi, and Behrouz H. Far (2016). "Exploring the Residual Queue Length Equation in the Shock Wave Model". 51st Annual CTRF Conference, Canadian Transportation Research Forum, Toronto, Ontario, Canada, 2016.

## Magazines and Technical Reports

- Matthew Palm, Siobhan Teel, Ignacio Tiznado-Aitken, Anastasia Soukhov, Antonio Paez, Steven Farber, and Michael Hain. "Developing Data Driven Equity Standards: Stakeholder Perspectives.", Technical Report, Participation in the Mobilizing Justice Report, May, 2023. Available online at:(https://mobilizingjustice.ca/wp-content/uploads/2023/06/Developing\_Data\_ \_Driven\_Standards\_FINAL\_2023\_06\_06.pdf).
- 2. Mohammad Noaeen, Joe McFarland. "Can Artificial Intelligence and Social Media Help Relieve Traffic Gridlock?", Invited interviw, UToday, Schulich School of Engineering, University of Calgary, July 16, 2021. Available online at: (https://schulich.ucalgary.ca/news/artificial-intelligence-social-media-data-help-ease-traffic-headaches)
- Mohammad Noaeen, Behrouz H. Far, Mohsen Ramezani. "Real-Time Signal Control for Urban Networks", In Canadian Civil Engineer Magazine, Intelligent Transportation Systems (pp. 28-29). Available online at: (https://csce.ca/wp-content/uploads/2018/06/Civil\_Winter2017\_LA Z\_.low\_.pdf)

# PRESENTATIONS AND TALKS

#### **Guest Lecturer**

1. **Mohammad Noaeen**. "HealthyPlan.City: A Web Tool to Support Urban Environmental Equity and Public Health in Canadian Communities.", Guest Lecturer in Jeffrey Brook's Course, January 30, 2024.

#### Presentations

- 1. **Mohammad Noaeen**, and Jeffrey R. Brook. "Reducing Traffic Congestion with Machine Learning: Exploring an Environmental Justice Approach.", Emerging Mobility Scholars Conference (EMSC 2023), June 22, 2023.
- 2. Mohammad Noaeen, Somayeh Amini, Shveta Bhasker, Zohreh Ghezelsefli, Aisha Ahmed, Omid Jafarinezhad, and Zahra Shakeri Hossein Abad. "Unlocking the Power of EHRs: Harnessing Unstructured Data for Machine Learning-based Outcome Predictions.", the 45th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Sydney, Australia, 2023.
- 3. Mohammad Noaeen, and Behrouz H. Far. "The Efficacy of Using Social Media Data for Designing Traffic Management Systems." The IEEE 28th International Requirements Engineering Conference Workshops (REW), 2020.

- 4. **Mohammad Noaeen**, and Behrouz H. Far. "Social media analysis for traffic management." Proceedings of the 14th International Conference on Global Software Engineering. IEEE Press, 2019.
- 5. Mohammad Noaeen, Zahra Shakeri Hossein Abad, Guenther Ruhe, and Behrouz H. Far (2018). "Transportation Engineering on Social Question and Answer Websites: An Empirical Case Study". In Highlighting the Importance of Big Data Management and Analysis for Various Applications (pp. 117-139).
- 6. Mohammad Noaeen, Zahra Shakeri Hossein Abad, and Behrouz H. Far (2017). "Let's Hear It From RETTA: A Requirements Elicitation Tool For TrAffic Management Systems". The 35th IEEE International Conference on Requirements Engineering (RE). IEEE, Lisbon, Portugal, 2017.
- 7. Mohammad Noaeen, Amir Abbas Rassafi, and Behrouz H. Far. "Traffic Signal Timing Optimization by Modelling the Lost Time Effect in the Shock Wave Delay Model". ASCE International Conference on Transportation & Development (ICTD2016), Houston, Texas, US. American Society of Civil Engineers (ASCE), 2016.
- 8. Mohammad Noaeen, Amir Abbas Rassafi, and Behrouz H. Far (2016). "Exploring the Residual Queue Length Equation in the Shock Wave Model". 51st Annual CTRF Conference, Canadian Transportation Research Forum, Toronto, Ontario, Canada, 2016.

# Training Workshop

1. Mohammad Noaeen, Mobility Network Summer School 2023 'Measure what matters: Urban mobility in an era of climate emergency', University of Toronto, Toronto, Canada, June 20-21, 2023. [A two-day training workshop to develop a roadmap for evaluating government investment in transportation infrastructure.]

Fall 2023

Winter 2020

Fall 2019

Summer 2012

## TEACHING EXPERIENCE & CERTIFICATES

### Co-Instructor

- Applied Machine Learning for Health Data Dalla Lana School of Public Health, University of Toronto

# **Laboratory Instructor**

- ENGG 225 Fundamentals of Electrical Circuits and Machines Schulich School of Engineering, University of Calgary

#### Sessional Instructor

ENGG 233 Computing For Engineers
 Schulich School of Engineering, University of Calgary
 Road and Building Construction Machines

Department of Civil Engineering, University of Ahrar

## Teaching Assistant

Department of Electrical and Computer Engineering, University of Calgary Fall 2014-2020 Fall 2014, 2016, 2020 - ENGG-233 Computing for Engineers - SENG-637 Dependability and Reliability of Software Systems Summer 2019, 2020 - ENEL-645 Data Mining and Knowledge Discovery Spring 2019 - ENSF-619.25 Machine Learning for Engineering Students Winter 2019 - ENSF-619.30 Software Requirements Analysis and Process Management Fall 2017, 2018 - ENSF-480 Principles of Software Design Fall 2018 Winter 2015-2018 - ENGG-225 Fundamentals of Electrical Circuits and Machines - ENGG-502 Senior Capstone Design Project Fall 2017, Winter 2018 - ENEL-500 Computer, Electrical, and Software Engineering Team Design Winter 2018

- ENGG-501 Senior Capstone Design Project	Fall 2017
- ENGG-209 Engineering Economics	Fall 2014, 2015

# Learning Assistant

Devon Academic Resource Centre, Schulich School of Eng., University of Calgary	Fall 2015- Winter 2016
- ENGG-202 Engineering Statics	Winter 2016
- ENGG-317 Mechanics of Solids	Winter 2016
- ENGG-233 Computing for Engineers	Fall 2015
- Math-275 Calculus for Engineers and Scientists	Fall 2015
- Math-211 Linear Methods I	Fall 2015

# Graduate Student Teaching Development (GSTD) Certificate

Educational Development Unit, University of Calgary Sep 2015

## **Instructional Skills Certificate**

Educational Development Unit, University of Calgary

April 2015

#### RESEARCH FUNDINGS

#### **Grant Proposal Submissions**

- 1. Jeffrey Brook, Dany Doiron, Joey Syer, **Mohammad Noaeen**. "Development of Technical Guidance to Advance Heat-health Vulnerability Maps in Canada", Standards Council of Canada, Nov 2023.
- Jeffrey Brook, Mohammad Noaeen, Dany Doiron, Joey Syer. "HealthyToronto.City: Advancing Climate Change Vulnerability Assessment in Toronto via Analytical Hierarchy Process and Machine Learning Techniques", Ontario Collaborative Innovation Platform, The city of Toronto, CivicLabTO Research, Sep 2023.
- 3. Samar Sabie, Ted Kesik, Seungjae Lee, **Mohammad Noaeen**. "Identifying Workforce Development Requirements for Prefabricated Home Overcladding Services in Toronto through a Tri-Method Approach", Ontario Collaborative Innovation Platform, The city of Toronto, CivicLabTO Research, Sep 2023.

#### PROFESSIONAL EXPERIENCE

#### Research Assistant

Institute of Health Policy, Management and Evaluation, DLSPH	June 2023- Present
Dalla Lana School of Public Health, University of Toronto	June 2022- Present
Harvard Business School, Marketing Unit, Harvard University	Jan 2022- Present
Department of Civil and Mineral Engineering, University of Toronto	Mar 2021- Sep 2021
School of Civil Engineering, Transport Engineering, University of Sydney	Sep 2021- Dec 2021
Department of Electrical and Computer Engineering, University of Calgary	Sep 2014- Dec 2020
Department of Civil Engineering, Imam Khomeini International University	Sep 2006- Sep 2009

# Supervision and Mentoring

IHPME, DLSPH, University of Toronto

Katherine Lu, Paijani Sheth, Zhi Lin Zhou (MSc students)

"ML for Identifying Prediabetes"

Nov 2023- Mar 2024

IHPME, DLSPH, University of Toronto

Nov 2023- Mar 2024

Chelsea Tanchip (MSc student)

"ML for Predicting Donor Selection"

IHPME, DLSPH, University of Toronto

Nov 2023- Mar 2024

Kayla Esser, Monica Duong, Khalil Kain, Son Tran (MSc student)

"ML for Predicting Diabetes Prevalence"

IHPME, DLSPH, University of Toronto

Nov 2023- Mar 2024

Priyonto Saha, Yacine Marouf, Hunter Pozzebon (MSc student)

"ML for Predicting the Time to Diabetes Onset"

IHPME, DLSPH, University of Toronto

Nov 2023- Mar 2024

Konrad Samsel, Amrit Tiwana, Sarra Ali (MSc student)

"ML for Predicting Depression"

Department of Civil and Mineral Engineering, University of Toronto

Nov 2021- Mar 2023

Xiaocan Li (Ph.D. student)

"Perimeter Control Using Deep Reinforcement Learning"

Department of Electrical and Computer Engineering, University of Calgary

May 2015- Sep 2015

Saad Khurshid (Undergraduate student)

"A Lane-based Traffic Signal Control Strategy for Emergency Vehicle Preemption in a Connected Vehicle Environment"

Department of Electrical and Computer Engineering, University of Calgary Jan 2020- Dec 2020 Atharva Naik, Liana Goodman, Jared Crebo, Taimoor Abrar (Undergraduate students)

"Reinforcement Learning in Urban Network Traffic Signal Control"

Designer, Project Manager, Superintendent, Supervisor, and CEO

Jul 2003- Feb 2013

Sakht-o-Saz Mehr Construction Company, Iran

Construction: 15 projects, including residential, industrial, and educational buildings, roads, and bridges.

Design and Supervision: 5 buildings

## **Development Skills**

Programming and Scripting Languages - Python, R, Java, Processing

Database Tools - NoSQL, SQL (PostgreSQL, MongoDB)

Geo-Spatial Tools - ArcGIS

Operating Systems - Linux, MacOS, Microsoft Windows

Traffic Simulation - Aimsun, Vissim, Sumo

Engineering and Visualization Tools - Tableau, Matlab, Maple, Sap, Safe, AutoCAD (2d/3d)

#### PROFESSIONAL SERVICE

## Leadership and Academic Services (Volunteer)

Member of Mobility Network Postdoctoral Community of Practice Mobility Network, University of Toronto Dec 2022- Present

Selected to serve as the Student Volunteer

Sep 2017

The 25th IEEE International Requirements Engineering Conference, Lisbon, Portugal

Member of Computer Science Teaching and Learning (CSTL) Forum

Sep 2016- Aug 2017

Department of Computer Science, University of Calgary

Facilitator of the boot camp writing sessions for graduate students

Jun 2016- Jun 2017

Student Success Centre (SSC), University of Calgary

Member of Graduate Students Association (GSA) award committee Faculty of Graduate Studies, University of Calgary	Sep 2016- Sep 2017
Graduate Student Representative, Schulich Student Activity Fund Committee Schulich School of Engineering, University of Calgary	Oct 2016- Oct 2017
Vice President-Finance of Electrical and Computer Eng. Graduate Students Department of Electrical and Computer Engineering, University of Calgary	Apr 2015- Apr 2016
$\label{lem:committee} Graduate\ Student\ Representative,\ Schulich\ Student\ Activity\ Fund\ Committee} \\ Schulich\ School\ of\ Engineering,\ University\ of\ Calgary$	Apr 2015- Apr 2016
Event-Based Volunteer, Persian Gulf Club Charity Foundation University of Calgary	Apr 2014- Apr 2016
Member of the Organizing Committee of Intelligent Data Analytic Workshop 2 Department of Electrical and Computer Engineering, University of Calgary	2015 Mar 2015
Vice President-External, Electrical, and Computer Eng. Graduate Students Department of Electrical and Computer Engineering, University of Calgary	Jan 2015- Apr 2015
Technical Program Committee and Reviewer	
The IEEE Intelligent Transportation Systems Conference (ITSC) (Reviewer) The IET Intelligent Transport Systems (Reviewer) Journal of Environmental Science and Technology (Reviewer) Journal of Expert Systems with Applications (Reviewer) IEEE Transactions on Intelligent Transportation Systems (Reviewer) Journal of Traffic and Transportation Engineering (English Edition) (Reviewer) The IEEE Intelligent Transportation Systems Society Conference (Reviewer) The 12th International Workshop of Agents in Traffic and Transportation (Con	2022

# HONOURS AND AWARDS

- Artificial Intelligence for Public Health (AI4PH) Postdoctoral Fellowship Award, University	of Toronto,
Canada	$Aug\ 2024$
- Data Science Institute Postdoctoral Fellowship Award, University of Toronto, Canada	Jun~2024
- BeSpatial Ontario award, 2024 Best Innovation in GIS Award, Canada (CANUE Team)	May 2024
- Google Earth's Geo for Good Impact Award, Canada (CANUE Team)	May 2024
- GSA's Excellence in Teaching Award, University of Calgary, Canada	Apr~2020
- Eberlein Systems Dynamics Graduate Scholarship, Alberta, Canada	Jan~2020
- ECE Research Productivity Award, University of Calgary, Canada Apr 2016,	2017, 2018
- Eberlein Systems Dynamics Graduate Scholarship, Alberta, Canada	Sep~2018
- IEEE RE'17 Best Tool Demonstration Award, Lisbon, Portugal	Sep 2017
- Vanier Scholarship finalist, University of Calgary, Canada	Sep~2016
- MSc Graduate Excellence Award, University of Calgary, Canada	Apr~2016
- Schulich Student Activities Fund (SSAF) Award, University of Calgary, Canada	Apr~2016
- Ranked Top 2% in the National University-Entrance Exam (MSc), Iran	2006
- Member of the National Organization for Development of Exceptional Talents (NODET), Iran	1994-2001

# CITIZENSHIP

- Canadian Citizen
- Iranian