

# Sevin Mohammadi

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EXPERTISE	Data Science   Predictive Machine Learning   Statistical Analysis   Quantitative Research	
EDUCATION	Columbia University, Ph.D. in Smart Cities, New York, NY	2020-2024
	<i>Thesis:</i> Geospatial probabilistic machine learning for analyzing urban vehicular mobility patterns With decision-making application; GPA: 4.06/4.00.	
	University of Tennessee Knoxville, M.Sc. in Transportation Science, Knoxville, TN; GPA: 3.90/4.00.	2017-2019
	Amirkabir University of Technology, M.Sc. in Computational Hydrodynamics, Tehran	2012-2015
COURSEWORK	K. N. Toosi University of Technology, B.Sc. in Civil Engineering, Tehran	2008-2012
	Signal Processing & Noise   Infrastructure Systems Optimization   Transportation Analytics & Logistics   Causal Inference for Data Science   Uncertainty & Risk   Big Data in Transportation   Data Analysis & Modeling   Statistical Inference   Bayesian Machine Learning   Deep Learning   Reinforcement Learning	
	Columbia University in the City of New York, <i>Smart Cities Lab and Center for Smart Streetscape</i>	
	• Associate Researcher Jan 2025- Jun 2025	
PROFESSIONAL EXPERIENCE	◦ Developed a dynamic, penalty-based decision-making system for <b>ambulance dispatch optimization</b> , integrating <b>supply-demand</b> quantification with <b>data science</b> , <b>heuristic policies</b> , and <b>probabilistic simulation</b> to enhance response times in high-demand urban areas.	
	• Graduate Researcher, Teaching Assistant, and Student Leadership Council Jan 2020- Dec 2024	
	◦ Developed <b>NLP-enabled</b> trajectory analysis using the <b>transformer architecture</b> , integrating <b>context-aware deep learning</b> and <b>geospatial analytics</b> for accurate <b>path inference</b> in urban road networks.	
	◦ Designed a probabilistic framework for travel time <b>reliable prediction</b> using <b>Bayesian regression with random parameters</b> , enhancing uncertainty quantification and <b>risk assessment</b> in transportation systems.	
	◦ Applied <b>Bayesian neural networks with physics-aware regularization</b> to model travel time variability, addressing data imbalances and improving predictive accuracy in transportation analytics.	
	◦ Developed a <b>probabilistic decision-making toolbox</b> for <b>hospital recommendation</b> , successfully <b>deployed by the Fire Department of New York City</b> , transforming data analyses into actionable insights.	
	• Student Leadership Council Aug 2023- Dec 2024	
	• Promoted Center for Smart Streetscapes by organizing events, SWOT surveys, and public communication.	
	The University of Tennessee, Knoxville, <i>Center for Transportation Research</i>	
	• Graduate Researcher and Teaching Assistant Aug 2018- Dec 2019	
SKILLS	◦ Identified correlations between environmental factors and driving behavior by applying <b>data mining</b> to large mobility <b>time series</b> and developing a <b>random parameter binary logit model</b> for <b>predictive analysis</b> .	
	<b>Programming:</b> Python, SQL, R   <b>DS:</b> NumPy, Pandas, GeoPandas, Scikit-learn, NetworkX, TensorFlow, Pytorch, PyMC3   <b>Others:</b> Git, Shell   <b>Soft:</b> Critical Thinking, Active Learning, Communication, Adaptability.	
JOURNAL PUBLICATIONS	[1] S. Mohammadi, A. Smyth, “NLP-enabled trajectory map-matching in urban road networks using Transformer seq2seq model,” IEEE Intelligent Transportation Systems, <i>revision submitted</i> , 2025.	
	[2] S. Mohammadi et al., “Dynamic penalty-based dispatching decision-making for improved EMS response in urban environments: a heuristic approach,” Frontiers in Future Transportation, <i>under review</i> , 2025.	
	[3] S. Mohammadi et al., “Probabilistic prediction of trip travel time and its variability using hierarchical Bayesian learning,” Journal of Risk and Uncertainty in Engineering Systems, 2023.	
	[4] A. Olivier et al., “Bayesian neural networks with physics-aware regularization for travel time modeling from imbalanced data,” Computer-Aided Civil Infrastructure Engineering, 2023.	
	[5] A. Olivier et al., “Data analytics for improved closest hospital suggestion for EMS operations in NYC,” Sustainable Cities and Society, 2022.	
	[6] E. L. de Larrea et al., “Simulating NYC hospital load balancing during COVID-19,” IEEE: WSC, 2021.	
	[7] S. Mohammadi et al., “The role of drivers’ social interactions in their driving behavior: empirical evidence and implications for car-following and traffic flow,” TR Part F: Traffic Psychology and Behavior, 2021.	
AWARDS	• Columbia University Academic Award for full tuition, research and teaching assistantships 2020-2024	
	• INFORMS Doing Good with Good O.R. student paper competition finalist 2021	
	• Morgan Stanley Women in Quantitative Finance Mentorship Program 2022	
	• The New York City Women in Transportation Leonard Braun Memorial Scholarship 2022	
	• University of Tennessee Academic Award for full tuition, research and teaching assistantships 2017-2019	