Kiarash Farzad, Ph.D. Candidate

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PROFESSIONAL SUMMARY

Doctoral researcher and data scientist in Interdisciplinary Engineering, specialized in numerical meteorological and air quality modeling, health impact assessment, and application and development of statistical and machine learning-based models. Proven leadership and project management skills, having led multiple PhD-level projects in collaboration with national institutes. Passionate about leveraging data-driven technologies to solve environmental and energy challenges with public health and sustainability implications.

SKILLS

Core Competencies: Analytical Problem Solving, Data-Driven Decision Making, Independent & Team-Based Research, Adaptability in Dynamic Environments, Clear Technical Communication, Project Management & Leadership, Self-Motivation & Continuous Learning, Resilience Under Pressure

Programming: R, Python (NumPy, pandas, scikit-learn, TensorFlow), MATLAB, Fortran, Bash, C Shell

Modeling & Analysis: CMAQ, CAMx, WRF, BenMAP, AERMOD, GCAM/GLIMPS, Timeseries (ARIMA, GARCH)

Data Science: Machine Learning (Linear Regression, GAM, RNN/LSTM), Statistical Analysis, High Performance Computing (HPC)

Visualization: Matplotlib, Seaborn, ArcGIS, QGIS

Productivity: Git, LaTeX, AutoCAD, FreeCAD, Photoshop, Microsoft Office

EDUCATION

Ph.D. in Interdisciplinary Engineering — Expected December 2025
Northeastern University, Boston, MA

M.S. in Civil & Environmental Engineering — February 2020
Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran

B.S. in Civil Engineering — June 2017
Islamic Azad University, Central Tehran Branch (IAUCTB), Tehran, Iran

RESEARCH EXPERIENCES

Doctoral Researcher — September 2021 - Present
Northeastern University, Boston, MA

- Simulated air quality using numerical models (AQMs) and evaluated results through statistical, spatial, and time-series analyses of surface, airborne, and satellite observations
- Developed a machine learning–enhanced AQM to produce high-resolution air quality data products
- Performed source apportionment analysis of air pollution in the Greater Boston area
- Designed and implemented a post-processing framework for CAMx and source apportionment on the Discovery HPC cluster
- Enhanced the National Air Quality Forecast Capability by upgrading the chemical mechanism in the forecasting model
- Led the installation of multiple AQMs on HPC infrastructure, optimizing performance and stability
- Developed a custom health impact assessment tool replicating BenMAP functionality for high-resolution, nationwide application across the U.S.

Graduate Researcher January 2018 - February 2020

Amirkabir University of Technology, Tehran, Iran

- Analyzed the relationship between air pollution and mortality using statistical methods
- Applied health impact assessment tools (i.e., BenMAP) to evaluate air quality effects in Tehran

PROFESSIONAL EXPERIENCES

Quality Assurance Coordinator October 2016 - July 2021

Pion Parto Biomedical Engineering Ltd., Tehran, Iran

- Contributed to the design and implementation of a Quality Management System (QMS) in alignment with ISO 9001 and ISO 13485, collaborating cross-functionally to ensure ongoing compliance
- Led internal audit preparation and execution, maintaining adherence to ISO 9001 and ISO 13485 standards

RELEVANT COURSES

Leadership: Leading Self and Others

Climate and Sustainability: Climate and Atmospheric Change**,** Sustainable Development and Environmental Engineering Management**,** Environmental Assessment of Civil Engineering Projects

Data Science: Time Series and Geospatial Data Sciences**,** Remote Sensing (RS) and GIS Applications in Civil Engineering

Air Quality: Advanced Air Quality**,** Air Quality Modeling and Forecasting**,** Principles of Air Pollution Engineering**,** Fundamentals of Transport and Pollution Modeling**,** Environmental Chemistry

Health: Tools and Techniques of Environmental Health

SELECTED PUBLICATIONS

Journal Papers (2/7)

- Farzad, K., Zhang, Y., Wang, K., Chen, X., Goldberg, D. L., & Bell, M. L. (2025). Statistical downscaling of coarse-resolution fine particulate matter predictions over the contiguous United States: model development, evaluation, and implication in health impact assessment. *Science of The Total Environment.* (under review)
- Farzad, K., Khorsandi, B., Khorsandi, M., Bouamra, O., & Maknoon, R. (2020). A study of cardiorespiratory related mortality as a result of exposure to black carbon. *Science of The Total Environment*, 725, 138422. https://doi.org/10.1016/j.scitotenv.2020.138422

Conference Presentations

- Farzad, K., Zhang, Y., Wang, K., Chen, X., & Goldberg, D. L. (2023), Statistical Downscaling of Coarse-Resolution $PM_{2.5}$ Predictions from a 3-D Air Quality Model to 1 km over the Contiguous United States, poster presentation at the *AEESP 2023* meeting, June 21, 2023, Boston, MA, USA.

COMMUNITY INVOLVEMENTS

Community Science Engagement Volunteer January 2024 - Present

Northeastern University, Boston, MA - ISUPER, Impact Engines

- Presented community-engaged research training content
- Conducted and facilitated youth-oriented data analysis and data portal listening sessions

Executive Board Member August 2022 - August 2025

Northeastern University, Boston, MA - Civil & Environmental Engineering Graduate Student Council

- Planned, coordinated, and executed academic and social events for graduate students