

Sina Shid-Moosavi

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SUMMARY

Doctoral researcher with 4+ years of expertise in integrating machine learning and AI into complex engineering areas. Demonstrated proficiency in data analysis, interdisciplinary research, and translating theory into scalable engineering solutions.

EDUCATION

Northeastern University

Ph.D. Candidate in Civil Engineering - Data and Systems

Boston, MA

Sep. 2023 – Present

University of Central Florida

M.Sc. in Smart Cities

Orlando, FL

Aug. 2021 – Aug. 2023

AmirKabir University of Technology

M.Sc. in Structural Engineering

Tehran, Iran

Sep. 2014 – Feb. 2017

Shiraz University

B.Sc. in Civil Engineering

Shiraz, Iran

Sep. 2010 – Sep. 2014

EXPERIENCE

Doctoral Researcher

Northeastern University

Sep. 2023 – Present

Boston, MA

- Handling data scarcity using a Graph Neural Network that links turbines through spatial and wake-based edges.
- Built a Gaussian Process Regression model for wind turbine maintenance prediction using sensor data.
- Integrated physics into Gaussian Process Regression for wind, turbulence, and veer prediction with uncertainty.
- Applied statistical and Machine Learning methods to identify operational patterns and outliers in time-series data.
- Fused cepstral and image features for vibration-based damage detection, improving accuracy by 10%.
- Used Bayesian optimization to tune dynamic system parameters, cutting model runtime by 40%.
- Implemented Reinforcement learning-based adaptive parameter tuning for real-time damage response.
- Performed sensitivity analysis to identify key drivers of wake-induced fatigue.
- Visualized large-scale data trends to support decision-making in model calibration.

Graduate Research Assistant

University of Central Florida

Aug. 2021 – Aug. 2023

Orlando, FL

- Implemented real-time passenger detection, achieving 98% accuracy on 4,300-image customized dataset.
- Used DeepSORT for multi-object tracking and OSNet for passenger re-identification with 92% Rank-1 accuracy.
- Deployed IoT-enabled Jetson TX2 edge-computing system for on-bus real-time data processing and storage.
- Integrated location and video data to identify passenger origin-destination pairs for route-level analysis.
- Automated boarding and alighting detection across 12 bus stops with 82% accuracy for origin-destination analysis.
- Prepared a customized dataset with 3,060 images and 200 unique IDs for passenger re-identification.
- Fine-tuned models using a customized dataset to handle lighting and occlusion, improving accuracy by over 30%.
- Developed 3D deformation sensing via multi-camera photogrammetry for structural displacement quantification.
- Utilized UAV-based sensing to map surface water networks and estimate flooded areas in vegetated regions.

Structural Design Engineer

Miragar Tajheez (Construction Company)

Sep. 2018 – Feb. 2021

Tehran, Iran

- Managed structural evaluation, rehabilitation, and system design for enhanced performance.
- Pioneered seismic control solutions and improved safety standards through successful rehabilitation.
- Conducted destructive and nondestructive field tests to assess structural performance.

Graduate Research Assistant

AmirKabir University of Technology

Sep. 2014 – Feb. 2017

Tehran, Iran

- Investigated seismic performance of integral and semi-integral pre-tensioned concrete bridges using FEM.
- Analyzed bridge-soil interaction effects on seismic behavior.

TECHNICAL SKILLS

Programming: Python (Tensorflow, PyTorch, Keras, OpenCV, Scikit-Learn, Numpy, Pandas, Matplotlib, Seaborn) | MATLAB | Machine Learning (Decision Trees, RF, SVM, KNN, ANN) | Deep Learning (RNN, CNNs, LSTM, GNN, Transformers, YOLO, R-CNN, FPN, U-Net, ResNet, OSNet, DeepSORT) | Neural Networks | Computer Vision (Image Classification, Object Detection, VAE, GAN) | Time-series analysis.
Software: OpenSees | ABAQUS | VecTor2 | CSI Software (Safe, Etabs, Sap, Bridge) | Floris | Seismosignal | AutoCAD | ArcGIS | DJI Terra | Agisoft Metashape | TrueView EVO / LP360.

RELEVANT COURSES

Machine Learning and Pattern Recognition, Reinforcement Learning, Computer Vision, 3D Computer Vision, Image Processing, Time Series and Geospatial Data Sciences, and System Identification.

HONORS AND ACADEMIC ACHIEVEMENTS

Best Poster Award at CEE Graduate Research Expo, Northeastern University	2024
Northeastern University CEE Fellowship Recipient	2023
University of Central Florida ORCGS Fellowship Recipient	2021
Ranked 7th among approximately 3000 participants in the nationwide university entrance exam in Structural Engineering for the Ph.D. Degree	2018
Ranked 6th among 30 students in master's program at AmirKabir University of Technology	2017
Merit-based admission to M.Sc. Structural Engineering program at AmirKabir University of Technology without the need to take the university entrance exam due to the high GPA as a Gifted Student	2014
Ranked 3rd among 50 students in undergraduate study at Shiraz University	2014
2nd ranked student award among the graduated students of Civil and Environmental Engineering Department of Shiraz University based on GPA and academic activities	2014
Ranked among the top 1% of students out of 500,000 participants in the National University Entrance Exam	2010
Awarded to study in National Organization for Development of Exceptional Talents (NODET) for High School and Middle School	2006 2003

PUBLICATIONS

Journal Papers

1. Di Cioccio, F., **Shid-Moosavi, S.**, Haghi, R., Tronci, E., Moaveni, B., Liberatore, S., and Hines, E., (2025). "Calibration of Wake Models for the Block Island Offshore Wind Farm Using SCADA Measurements." *Fluids and Structures, (Under Review)*
2. **Shid-Moosavi, S.**, Di Cioccio, F., Haghi, R., Tronci, E., Moaveni, B., Liberatore, S., and Hines, E., (2025). "Modeling and Experimentally-Driven Sensitivity Analysis of Wake-Induced Power Loss in Offshore Wind Farms: Insights from Block Island Wind Farm." *Renewable Energy*, 122126.
3. **Shid-Moosavi, S.** and Rahai, A., (2018). "The Performance of Integral and Semi-integral Pre-tensioned Concrete Bridges under Seismic Loads in Comparison with Conventional Bridges." *Amirkabir Journal of Civil Engineering*, Volume 2, Issue 2, Page 219-226.

Conference Papers

1. Tronci, E., **Shid-Moosavi, S.**, and Speciale, C., (2025). "Pattern Recognition and Damage Detection in Wind Turbine Monitoring Using Cepstral Coefficients." *11th International Conference on Experimental Vibration Analysis of Civil Engineering Structures (EVACES 2025)*, Porto, Portugal.
2. **Shid-Moosavi, S.**, Speciale, C., and Tronci, E., (2025). "Damage Identification Strategy in Time-Varying Dynamic Systems Combining Cepstral and Image-Based Features." *International Modal Analysis Conference (IMAC-XLIII)*, Orlando, FL, USA.
3. **Shid-Moosavi, S.**, Hassan, Z., and Sun, P., (2022). "Towards Full-field Sensing of 3D Deformation in Structural Components using Multi-camera Photogrammetry." *8th World Conference on Structural Control and Monitoring (8WC-SCM)*, Orlando, FL, USA.
4. Vasef, M., Marefat, M., **Shid-Moosavi, S.**, and Sun, P., (2022). "Monitoring the Seismic Behavior of a Scaled RC Frame of Intermediate Ductility in a Shaking Table Test." *8th World Conference on Structural Control and Monitoring (8WCSCM)*, Orlando, FL, USA.

5. Abasi, A., **Shid-Moosavi, S.**, and Rahai, A., (2019). "Seismic performance of integral, semi-integral, and conventional bridges." *5th International Conference on Bridge (IBC)*, Amirkabir University of Technology, Tehran, Iran.
6. **Shid-Moosavi, S.** and Rahai, A., (2019). "The performance of integral and semi-integral pre-tensioned concrete bridges under thermal loads depending on various deck lengths and joint conditions." *11th National Congress on Civil Engineering (11-NCCE)*, Shiraz University, Shiraz, Iran.

Conference Presentations

1. **Shid-Moosavi, S.**, Tronci, E., Moaveni, B., Liberatore, S., and Hines, E., (2026). "Graph Neural Network Modeling of Turbulence-Induced Fatigue in Offshore Wind Turbine Towers." *International Modal Analysis Conference (IMAC-XLIV)*, Palm Springs, CA, USA. (*Forthcoming, January 2026*)
2. **Shid-Moosavi, S.**, Speciale, C., Milana, S., and Tronci, E., (2026). "Reinforcement Learning-Based Tuning of Damage Detection Parameters for Wind Turbine Diagnostics Using Cepstral Coefficients." *International Modal Analysis Conference (IMAC-XLIV)*, Palm Springs, CA, USA. (*Forthcoming, January 2026*)
3. Speciale, C., **Shid-Moosavi, S.**, Milana, S., and Tronci, E., (2026). "Dynamic Recognition of Damage States in Wind Turbines Using Cepstral Coefficients and ANOVA Analysis." *International Modal Analysis Conference (IMAC-XLIV)*, Palm Springs, CA, USA. (*Forthcoming, January 2026*)
4. **Shid-Moosavi, S.**, Tronci, E., Hines, E., Kirincich, A., and Moaveni, B., (2025). "Data Driven Mapping of Turbulence Intensity for Wake Modeling of Offshore Wind Systems." *North American Wind Energy Academy Conference (NAWEA/WindTech 2025)*, Dallas, TX, USA.
5. Di Cioccio, F., **Shid-Moosavi, S.**, Haghi, R., Tronci, E., Moaveni, B., Liberatore, S., and Hines, E., (2025). "Calibration of Wake Model in a Wind Farm using Measured Data: A Case Study of Block Island Wind Farm." *Wind Energy Science Conference 2025 (WESC 2025)*, Nantes, France.
6. **Shid-Moosavi, S.**, Di Cioccio, F., Haghi, R., Tronci, E., Moaveni, B., Liberatore, S., and Hines, E., (2025). "Investigating the Impact of Wake-Induced Turbulence on Tower Fatigue Accumulation in the Block Island Wind Farm." *The First New England Fluid-Structure Interactions Symposium (NEFSI 25)*, Amherst, MA, USA.
7. Di Cioccio, F., **Shid-Moosavi, S.**, Haghi, R., Tronci, E., Moaveni, B., Liberatore, S., and Hines, E., (2025). "Model Updating for Improved Wake Prediction: Balancing Fidelity and Computational Cost in Offshore Wind Farms." *The First New England Fluid-Structure Interactions Symposium (NEFSI 25)*, Amherst, MA, USA.
8. **Shid-Moosavi, S.**, Di Cioccio, F., Haghi, R., Tronci, E., Moaveni, B., Liberatore, S., and Hines, E., (2025). "Assessing Wake-Induced Fatigue in Offshore Wind Turbines Using Dynamic and SCADA Data." *International Modal Analysis Conference (IMAC-XLIII)*, Orlando, FL, USA.
9. **Shid-Moosavi, S.**, Partovi Mehr, N., Tronci, E., Moaveni, B., and Hines, E., (2024). "Pattern Recognition in Offshore Wind Turbine Dynamics: Unveiling Fatigue and Damage Signatures." *Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC 2024)*, Chicago, IL, USA.
10. Iraniparast, M., **Shid-Moosavi, S.**, Sun, P., Wang, T., Apostolakis, G., and Mackie, K., (2023). "Multi-vision System for Full-field Strain Measurement and Crack Tracking on UHPC Beams." *Engineering Mechanics Institute Conference (EMI 2023)*, Atlanta, GA, USA.
11. **Shid-Moosavi, S.**, Sun, P., Jariz, C., and Wang, D., (2022). "UAV-based Remote Sensing to Measure Water Surface Areas in Florida." *AGU 2022 Conference*, Chicago, IL, USA.
12. Sun, P., **Shid-Moosavi, S.**, Jariz, C., Kanya, A., and Wang, D., (2022). "UAV-based watershed surveying over Florida forests." *FL-ASPRS/UF Spring 2022 LiDAR Workshop*, Orlando, FL, USA.

Poster Presentations

1. **Shid-Moosavi, S.**, Tronci, E., and Caracoglia, L., (2025). "Physics-Informed Gaussian Process Framework for Offshore Wind Profile Reconstruction and Wake Prediction." *North American Wind Energy Academy Conference (NAWEA/WindTech 2025)*, Dallas, TX, USA.
2. **Shid-Moosavi, S.**, Di Cioccio, F., Haghi, R., Tronci, E., Moaveni, B., Liberatore, S., and Hines, E., (2024). "Experimentally Driven Sensitivity Analysis of Operational Parameters for Wake-induced Power Loss in the Block Island Offshore Wind Farm." *North American Wind Energy Academy Conference (NAWEA/WindTech 2024)*, New Brunswick, NJ, USA.