Milad Basirifard

Ph.D. Student in Environment and Sustainability
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RESEARCH INTERESTS

Hydrological modeling and forecasting; machine learning and deep learning for environmental systems; reservoir operations; flood risk and climate variability; water quality and wastewater process modeling.

EDUCATION

University of Michigan Jan 2026–Present
Ph.D. in Environment and Sustainability *(in progress)*
School for Environment and Sustainability (SEAS), Ann Arbor, MI
Current advisor: Prof. Drew Gronewold

University of Oklahoma Aug 2024–Dec 2025
Doctoral study in Civil Engineering (Water Resources)
Advisor: Prof. Tiantian Yang | GPA: 4.00/4.00
Transferred to the University of Michigan in January 2026.

University of Tehran Sep 2018
M.Sc. in Environmental Engineering (Sea and Coastal Pollution)
Advisor: Prof. Masoud Sadrinasab | GPA: 3.87/4.00
Thesis: Evaluation of the COHERENS model for thermal effluent effects from Bandar Abbas Power Plant on water temperature, with comparison to field data.

Sharif University of Technology Sep 2015
B.Sc. in Civil Engineering | GPA: 3.50/4.00

RESEARCH EXPERIENCE

Doctoral Researcher Jan 2026–Present
University of Michigan, School for Environment and Sustainability

- Conduct doctoral research in hydrological modeling, machine learning, and water resources forecasting.
- Current research directions include Great Lakes flood modeling, hybrid hydrological models, and ensemble forecasting under Prof. Drew Gronewold.

Graduate Research Assistant 2024–2025
University of Oklahoma, School of Civil Engineering and Environmental Science
Appointments: Aug 2024–Jan 2025 and May–Aug 2025 | Advisor: Prof. Tiantian Yang

- Developed and evaluated machine learning and deep learning models for daily reservoir release simulation across 441 reservoirs in the contiguous United States.
- Investigated LSTM hyperparameter optimization and comparative model performance; prepared hydrological datasets, manuscripts, and AGU conference abstracts.

PEER REVIEWED JOURNAL ARTICLES

Author name shown in bold. Publications listed in reverse chronological order.

7. **Basirifard, M.**, Zhang, J., Cao, J., Liu, X., Hong, Y., & Yang, T. (2026). A hyperparameter tuning strategy for an LSTM model to simulate reservoir outflows: large-scale evaluation across 441 dams in the CONUS. *Journal of Hydrology, 679*, 136204. doi:10.1016/j.jhydrol.2026.136204.
6. Mousazadehgavan, M., Abdullhadi, B., **Basirifard, M.**, Malekdar, F., Shahi Jouneghani, M., Kamyab Rudsari, A., & Ghanbari, R. (2026). Data-driven prediction of SAnMBR performance under phenolic shock loads: a comparative machine learning study. *Earth Systems and Environment, 10*, 12607–12623. doi:10.1007/s41748-026-01254-9.
5. Zhang, J., Yue, H., **Basirifard, M.**, Cao, J., & Yang, T. (2025). A Mamba-type of deep state space model for reservoir release simulation with a large-scale verification over 441 dams across CONUS. *Journal of Hydrology, 662*, 134145. doi:10.1016/j.jhydrol.2025.134145.
4. Mousazadehgavan, M., Hajalifard, Z., **Basirifard, M.**, Afsharghoochani, S., Mirkhalafi, S., Kabdaşlı, I., Hashim, K., & Nakouti, I. (2025). The critical role of artificial intelligence in optimizing electrochemical processes for water and wastewater remediation: a state-of-the-art review. *ACS ES&T Water, 5*(6), 2793–2811. doi:10.1021/acsestwater.5c00238.
3. Yoosefdoost, I., **Basirifard, M.**, Álvarez-García, J., & del Río-Rama, M. de la C. (2022). Increasing agricultural resilience through combined supply and demand management (Case study: Karaj Reservoir Dam, Iran). *Agronomy, 12*(9), 1997. doi:10.3390/agronomy12091997.
2. Yoosefdoost, I., **Basirifard, M.**, & Álvarez-García, J. (2022). Reservoir operation management with new multi-objective (MOEPO) and metaheuristic (EPO) algorithms. *Water, 14*(15), 2329. doi:10.3390/w14152329.
1. Bagherzadeh, F., Mehrani, M.-J., **Basirifard, M.**, & Roostaei, J. (2021). Comparative study on total nitrogen prediction in wastewater treatment plant and effect of various feature selection methods on machine learning algorithms performance. *Journal of Water Process Engineering, 41*, 102033. doi:10.1016/j.jwpe.2021.102033.

PREPRINT

Basirifard, M., & Yoosefdoost, I. (2023). An agent-based model for determining the agriculture demand based on farmers' socio-economic characteristics. *Preprints*. doi:10.20944/preprints202311.1628.v1.

BOOK

Application of QGIS in Water Resources and Hydrology. Salehian Publication. ISBN: 978-622-214-710-5.

CONFERENCE ABSTRACTS AND PAPERS

5. **Basirifard, M.**, Zhang, J., Cao, J., & Yang, T. (2025). Comparative AI techniques for reservoir outflow prediction: hyperparameter tuning and large-scale validation across 441 dams in CONUS. *AGU Annual Meeting*, New Orleans, LA. Session H106; abstract 1939472.
4. **Basirifard, M.**, Zhang, J., Cao, J., & Yang, T. (2025). Comparative analysis of ML and DL models for reservoir outflow prediction: hyperparameter tuning and feature selection across 441 CONUS dams. *AGU Annual Meeting*, New Orleans, LA. Session H037; abstract 1939796.
3. Zhang, J., **Basirifard, M.**, Cao, J., & Yang, T. (2025). A deep state space model for daily reservoir release simulation over the CONUS. *AGU Annual Meeting*, New Orleans, LA. H33D-05.
2. **Basirifard, M.**, & Ardestani, M. (2023). Quantitative and qualitative analysis of the Sarvestan Aquifer to achieve Sustainable Development Goals (SDGs). *First Conference of Architecture, Civil Engineering, Agriculture, Mining, and Environment*. In Persian.
1. **Basirifard, M.**, & Behrouz, M. (2020). Evaluation of the COHERENS model for the impact of thermal effluent from Bandar Abbas Power Plant on water temperature changes: a comparison with field data. *First International Engineering & Innovation Conference*, University of Tabriz. In Persian.

MANUSCRIPT IN PREPARATION

Basirifard, M., Zhang, J., Cao, J., & Yang, T. A large-scale comparison of different AI/DL models for simulating the daily releases of reservoir systems in the USA. *In preparation*.

TEACHING EXPERIENCE

Graduate Teaching Assistant University of Oklahoma
School of Civil Engineering and Environmental Science

Water Resources Systems Modeling Aug–Dec 2025
Hydrology Jan–May 2025
Held weekly office hours, supported student learning, and graded assignments and examinations.

PROFESSIONAL EXPERIENCE

Behan Sadd Consulting Engineers May 2020–May 2023
Water Resources and Hydrology Department, Tehran, Iran

- Developed, calibrated, and validated hydrological and hydraulic models for reservoirs, rivers, and watersheds.
- Simulated reservoir operations for flood control, irrigation, and hydropower studies.
- Assessed surface-water availability and the effects of climate variability on storage, streamflow, and drought and flood risks.

ACADEMIC SERVICE

Journal Peer Reviewer 2023–Present
184 verified peer reviews of 126 manuscripts across 27 journals.
Web of Science verified review record, November 2026.

Selected journals: *Journal of Hydrology*; *Journal of Hydroinformatics*; *Hydrology and Earth System Sciences*; *Natural Hazards and Earth System Sciences*; *Journal of Hydrometeorology*; *Environmental Modelling & Software*; *Science of the Total Environment*; *Journal of Water Process Engineering*; *Water Resources Management*; *Agricultural Water Management*; *Journal of the American Water Resources Association*; and *Journal of Water and Climate Change*.

HONORS AND AWARDS

Armstrong Memorial Scholarship Apr 2025
University of Oklahoma; awarded for the 2025–2026 academic year.

College of Engineering Graduate Fellowship Apr 2025
University of Oklahoma.

National University Entrance Examination Distinction 2011
Ranked 214 in the Mathematics and Physics track of Iran's national university entrance examination.

TECHNICAL SKILLS

Programming. Python; MATLAB

Data and modeling. Time-series analysis; machine learning; deep learning; model calibration and validation; hyperparameter optimization

Geospatial analysis. QGIS; ArcGIS Pro; ArcMap; SNAP

Hydrology and hydraulics. HEC-RAS (1D and 2D); HEC-HMS; ArcSWAT

Water quality. COHERENS; MIKE; QUAL2K

Engineering design. AutoCAD (2D and 3D); Civil 3D; SolidWorks

COMMUNITY SERVICE

Iranian Student Association, University of Oklahoma Aug–Dec 2025
Supported new Iranian students with cultural adjustment and campus resources, and helped organize community events.

OU Big Event, University of Oklahoma Apr 2025
Participated in university-wide community outreach and team volunteer activities.

MEMBERSHIP AND PROFESSIONAL DEVELOPMENT

American Geophysical Union Member since Aug 2025

Machine Learning, Stanford Online / Coursera Dec 2020
Autodesk Civil 3D, Coursera Dec 2020