Abbas Sharifi

Department of Civil and Environmental Engineering
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INTERESTS

Water Resource Engineering, Environmental Science, Biomedical Engineering, Computational Fluid Dynamics, Image and Signal Processing, Machine Learning.

EDUCATION

Florida International University, Miami FL, US
PhD in Civil Engineering, Jan 2022 - May 2025
(Water Resource Engineering)

Florida International University, Miami FL, US
Master of Science in Environmental Engineering, Jan 2022 - May 2024

Urmia University of Technology, Urmia, Iran
Master of Science in Mechanical Engineering, Sep 2014 - Sep 2016
(Energy Conversion, Fluid Mechanics and CFD)

Urmia University, Urmia, Iran
Bachelor of Science in Mechanical Engineering, Sep 2010 - Sep 2014

PROFESSIONAL EXPERIENCE

- Developed and validated three-dimensional numerical models for storm sewer geyser eruptions using *OpenFOAM*. These models were created to analyze fluid dynamics and design effective retrofitting systems.
- Modeled magnetic drug targeting in blood vessels by applying CFD and ferrohydrodynamic principles. The research analyzed biomagnetic fluid flow and heat transfer within stenotic and aneurysmal arteries.
- Deployed Artificial Intelligence and digital twin models for the advanced management of stormwater infrastructure systems in smart cities. This work included applying the Segment Anything Model for civil infrastructure defect assessment.
- Implemented CNNs and deep neural networks to segment and detect brain lesions and tumors in MRI, ultrasound, and mammography images.
- Achieved real-time prediction of air-water volume fractions in fluid systems by integrating deep learning algorithms with high-speed imaging data.
- Applied Convolutional Neural Networks to experimental and numerical data for the specific purpose of diagnosing fatigue foot from biomechanical inputs.
- Designed and prototyped an autonomous robot for surface water trash collection, integrating an IoT-based system for real-time environmental monitoring and remote operation, utilizing Raspberry Pi for control and data acquisition
- Directed the management of research and teaching laboratories for the Department of Civil and Environmental Engineering, a role that included the direct management of equipment.
- Tasked with the development and enforcement of laboratory safety protocols and the provision of technical training and support for student and faculty research projects.

JOB EXPERIENCE

Laboratory Manager I Florida International University
June 2025 - Present Miami FL, US

- Directed the management of research and teaching laboratories for the Department of Civil and Environmental Engineering.

- Developed and enforced comprehensive laboratory safety protocols compliant with OSHA and EPA standards, ensuring a safe environment for students and faculty.
- Managed a detailed inventory of chemicals and equipment and ensured all laboratory practices align with ABET accreditation criteria.
- Provided technical training and support for a wide range of student and faculty research projects

Teacher Assistant Florida International University
Jan 2022 - May 2024 Miami FL, US
Spring 2022:
Environmental Engineering for Global Sustainability, Air Pollution Engineering, Wastewater Treatment Engineering.
Summer 2022:
Introduction to Environmental Engineering, Environmental Laboratory
Summer 2023:
Fluid Mechanics
Spring 2024:
Fluid Mechanics, Environmental Engineering for Global Sustainability

Research Assistant Florida International University
Jan 2022 - Aug 2024 Miami FL, US
Dissertation: Experimental and Numerical Simulation of Storm Sewer Geysers and Design of Retrofitting Systems
(Fall 2022, Spring 2023, Fall 2023, Summer 2024)

Dissertation Year Fellowship (DYF) Florida International University
Aug 2024 - May 2025 Miami FL, US
(Fall 2024, Spring 2025)

Research Assistant Urmia University of Technology
Sep 2014 - Sep 2016 Urmia, Iran
Thesis: Numerical Study of Magnetic Drug Targeting in Blood Vessels

Laboratory Manager Urmia University of Technology
Oct 2016 - Jun 2017 Urmia, Iran
Fluid Mechanics laboratory, Fluid Mechanics Course

Instructor Urmia University of Technology
Dec 2015 - Jun 2016 Urmia, Iran
OpenFOAM, C++ programming

TECHNICAL EXPERIENCE

- **Co-Principal Investigator**, "An Engineering Approach to Coastal Conservation: The Design and Evaluation of Autonomous Floating Debris Collectors," Environmental Protection Agency (EPA)
- **Co-Principal Investigator** "NSF on geyser prediction using AI," National Science Foundation (NSF).
- **Academy Graduate & Mentor** for Peer-Reviewing Papers in Web of Science (2019- Present) [link]
- **Peer Review Record** (28 Journals, 84 papers)
- **Editorial Record** - (6 papers)
- **Guest Editor of Journal of Healthcare Engineering** for Special Issue of "*Complexity Systems for Scheduling in Healthcare*" [link] (Aug 2022 - May 2024)
- **Advisory board** of "*2nd International Conference on Artificial Intelligence Science and Applications in Industry and Society (CAISAIS 2023)* [link]

- **Guest Editor of Pharmaceutics** for Special Issue of "*Advances in Drug Targeting Chemistry and Magnetic Fluid Dynamics for Enhanced Therapeutic Efficacy*"[link] (Present)
- **Leader of Project**: Design and Implementation of the High Performance Computing (HPC) System Using Computer Clustering in Linux Operating System at Academic and Research Centers at *Urmia University of Technology* - (Mar 2016)

COMPUTER SKILLS

Computational Fluid Dynamics: OpenFOAM, ANSYS
Hydraulic and Hydrologic Modeling: HEC-RAS, HEC-HMS, SWMM.
Signal and Image processing: Python,MATLAB, C++
Machine Learning: Prediction, Classification and Segmentation Using Deep Learning Networks.
Statistical Analysis: R programming, Minitab, SPSS.
Software: SolidWorks, Fluent, Qt Designer, Adobe Illustrator
Devices: Data acquisition, Arduino, Digital components, Raspberry PI

JOURNAL ARTICLES (Published)

1. **Sharifi, A.**, Zanje S. R, Mahyawansi P., Leon A. S. (2025) Dynamics of Cyclic and Violent Geyser Eruptions in Storm Sewer Systems: An Experimental and Numerical Approach. Journal of Hydraulic Research. 63(5), 558-577. [Link]
2. Zanje, S. R., Mahyawansi, P., **Sharifi, A.**, Leon, A. S., Petrov, V., & Infimovskiy, Y. Y. (2024). Mechanistic Understanding of Field-Scale Geysers in Stormsewer Systems Using Three-Dimensional Numerical Modeling. Processes, 13(1), 32.[Link]
3. Reihanifar, M., Takallou, A., Taheri, M., Lonbar, A. G., Ahmadi, M., & **Sharifi, A.** (2024). Nanotechnology Advancements in Groundwater Remediation: A Comprehensive Analysis of Current Research and Future Prospects. Groundwater for Sustainable Development, 101330.[Link]
4. Leon, A. S., Yin, Z., & **Sharifi, A.** (2024). A finite volume model for maintaining stationarity and reducing spurious oscillations in simulations of sewer system filling and emptying. Journal of Hydraulic Research, 62(3), 267-282.[Link]
5. Mahyawansi, P., Zanje, S. R., **Sharifi, A.**, McDaniel, D., & Leon, A. S. (2024). Experimental investigation of storm sewer geyser using a large-scale setup. Physics of Fluids, 36(5).[Link]
6. **Sharifi, A.**, Beris, A. T., Javidi, A. S., Nouri, M. S., Lonbar, A. G., & Ahmadi, M. (2024). Application of artificial intelligence in digital twin models for stormwater infrastructure systems in smart cities. Advanced Engineering Informatics, 61, 102485.[Link]
7. Ahmadi, M., Gholizadeh Lonbar, A., Nouri, M., Sharifzadeh Javidi, A., Tarlani Beris, A., **Sharifi, A.**, & Salimi-Tarazouj, A. (2024). Supervised multi-regional segmentation machine learning architecture for digital twin applications in coastal regions. Journal of Coastal Conservation, 28, 44. [Link]
8. Mahyawansi, P., Zanje, S. R., **Sharifi, A.**, McDaniel, D., & Leon, A. S. (2024). Experimental and numerical investigation of a small scale storm sewer geyser. Journal of Hydraulic Research, 62, 25–38. [Link]
9. Ahmadi, M., Nia, M. F., Asgarian, S., Danesh, K., Irankhah, E., Lonbar, A. G., & **Sharifi, A.** (2023). Comparative Analysis of Segment Anything Model and U-Net for Breast Tumor Detection in Ultrasound and Mammography Images. arXiv Preprint arXiv:2306. 12510. [Link]
10. Ahmadi, M., Lonbar, A. G., **Sharifi, A.**, Beris, A. T., Nouri, M., & Javidi, A. S. (2023). Application of segment anything model for civil infrastructure defect assessment. arXiv Preprint arXiv:2304. 12600. [Link]

11. Ahmadi, M., **Sharifi, A.**, Jafarian Fard, M., & Soleimani, N. (2022). Detection of brain lesion location in MRI images using convolutional neural network and robust PCA. International Journal of Neuroscience, 133, 55–66. [Link]

12. **Sharifi, A.**, Ahmadi, M., Mehni, M. A., Jafarzadeh Ghoushchi, S., & Pourasad, Y. (2021). Experimental and numerical diagnosis of fatigue foot using convolutional neural network. Computer Methods in Biomechanics and Biomedical Engineering, 24, 1828–1840. [Link]

13. Davoudi, A., Ahmadi, M., **Sharifi, A.**, Hassantabar, R., Najafi, N., Tayebi, A., ... Others. (2021). Studying the effect of taking statins before infection in the severity reduction of COVID-19 with machine learning. BioMed Research International, 2021. [Link]

14. **Sharifi, A.**, Ahmadi, M., & Ala, A. (2021). The impact of artificial intelligence and digital style on industry and energy post-COVID-19 pandemic. Environmental Science and Pollution Research, 28, 46964–46984. [Link]

15. Abadi, M. Q. H., Rahmati, S., **Sharifi, A.**, & Ahmadi, M. (2021). HSSAGA: designation and scheduling of nurses for taking care of COVID-19 patients using novel method of hybrid salp swarm algorithm and genetic algorithm. Applied Soft Computing, 108, 107449. [Link]

16. Artin, J., Valizadeh, A., Ahmadi, M., Kumar, S. A. P., & **Sharifi, A.** (2021). Presentation of a novel method for prediction of traffic with climate condition based on ensemble learning of neural architecture search (NAS) and linear regression. Complexity, 2021, 1–13. [Link]

17. Nasirpour, M. H., **Sharifi, A.**, Ahmadi, M., & Jafarzadeh Ghoushchi, S. (2021). Revealing the relationship between solar activity and COVID-19 and forecasting of possible future viruses using multi-step autoregression (MSAR). Environmental Science and Pollution Research, 28, 38074–38084. [Link]

18. Varmaghani, A., Matin Nazar, A., Ahmadi, M., **Sharifi, A.**, Jafarzadeh Ghoushchi, S., & Pourasad, Y. (2021). DMTC: Optimize energy consumption in dynamic wireless sensor network based on fog computing and fuzzy multiple attribute decision-making. Wireless Communications and Mobile Computing, 2021, 1–14. [Link]

19. Ahmadi, M., **Sharifi, A.**, & Khalili, S. (2021). Presentation of a developed sub-epidemic model for estimation of the COVID-19 pandemic and assessment of travel-related risks in Iran. Environmental Science and Pollution Research, 28, 14521–14529. [Link]

20. Ahmadi, M., **Sharifi, A.**, Hassantabar, S., & Enayati, S. (2021). QAIS-DSNN: tumor area segmentation of MRI image with optimized quantum matched-filter technique and deep spiking neural network. BioMed Research International, 2021. [Link]

21. Hassantabar, S., Ahmadi, M., & **Sharifi, A.** (2020). Diagnosis and Detection of Infected Tissue of COVID-19 Patients Based on Lung X-Ray Image Using Convolutional Neural Network Approaches. Chaos, Solitons & Fractals, 110170. [Link]

22. Dorosti, S., Ghoushchi, S. J., Sobhrakhshankhah, E., Ahmadi, M., & **Sharifi, A.** (2020). Application of gene expression programming and sensitivity analyses in analyzing effective parameters in gastric cancer tumor size and location. Soft Computing, 24, 9943–9964. [Link]

23. Ahmadi, M., **Sharifi, A.**, Dorosti, S., Ghoushchi, S. J., & Ghanbari, N. (2020). Investigation of effective climatology parameters on COVID-19 outbreak in Iran. Science of the Total Environment, 138705. [Link]

24. Badfar, H., Motlagh, S. Y., & **Sharifi, A.** (2020). Numerical Simulation of Magnetic Drug Targeting to the Stenosis Vessel Using Fe3O4 Magnetic Nanoparticles Under the Effect of Magnetic Field of Wire. Cardiovascular Engineering and Technology, 11, 162–175. [Link]

25. Ahmadi, M., Jafarzadeh-Ghoushchi, S., Taghizadeh, R., & **Sharifi, A.** (2019). Presentation of a new hybrid approach for forecasting economic growth using artificial intelligence approaches. Neural Computing and Applications, 1–20. [Link]
26. **Sharifi, A.**, Ahmadi, M., Badfar, H., & Hosseini, M. (2019). Modeling and sensitivity analysis of NOx emissions and mechanical efficiency for diesel engine. Environmental Science and Pollution Research, 26, 25190–25207. [Link]
27. **Sharifi, A.**, Motlagh, S. Y., & Badfar, H. (2019b). Numerical investigation of magnetic drug targeting using magnetic nanoparticles to the Aneurysmal Vessel. Journal of Magnetism and Magnetic Materials, 474, 236–245. [Link]
28. **Sharifi, A.**, Motlagh, S. Y., & Badfar, H. (2019a). Ferrohydrodynamic analysis of heat transfer and biomagnetic fluid flow in channel under the effect of two inclined permanent magnets. Journal of Magnetism and Magnetic Materials, 472, 115–122. [Link]
29. Motlagh, S. Y., **Sharifi, A.**, Ahmadi, M., & Badfar, H. (2019). Presentation of new thermal conductivity expression for Al2O3-water and CuO–water nanofluids using gene expression programming (GEP). Journal of Thermal Analysis and Calorimetry, 135, 195–206. [Link]
30. **Sharifi, A.**, Yekani Motlagh, S., & Badfar, H. (2018). Investigation of the effects of two parallel wires' non-uniform magnetic field on heat and biomagnetic fluid flow in an aneurysm. International Journal of Computational Fluid Dynamics, 32(4–5), 248–259. [Link]
31. Badfar, H., Motlagh, S. Y., & **Sharifi, A.** (2017). Study of blood flow inside the stenosis vessel under the effect of solenoid magnetic field using ferrohydrodynamics principles. The European Physical Journal Plus, 132, 1–13. [link]
32. Jafarzadeh-Ghoushchi, S., **Sharifi, A.**, Ahmadi, M., & Maghami, M. (2017). Statistical study of seasonal storage solar system usage in Iran. Journal of Solar Energy Research, 2, 39–44. [link]

JOURNAL ARTICLES (Under Review)

1. **Sharifi, A.**, Zanje S. R, Mahyawansi P., Leon A. S. (2024) Understanding The Physical Processes in Storm Sewer Geysers Using Experimental and Numerical Time Traces of Superficial Flow Characteristics. Journal of Hydraulic Research
2. **Sharifi, A.**, Zanje S. R, Mahyawansi P., Leon A. S. (2024) A Retrofitting Solution for Geyser Eruptions in Storm Sewer Systems: Experimental and Numerical Analysis. Journal of Hydraulic Research

CONFERENCE ARTICLES

1. **Sharifi, A.**, Zanje, S. R., Mahyawansi, P., & Leon, A. S. Numerical Investigation of the Physical Mechanisms behind Geysers in Storm Sewer Systems: A Slug Analysis Based on a Computational Study of Geyser Eruptions. In World Environmental and Water Resources Congress 2024 (pp. 835-845)[Link]
2. **Sharifi, A.**, Zanje, S. R., Mahyawansi, P., & Leon, A. S. Real-Time Air-Water Volume Fraction Prediction Using Deep Learning and High-Speed Imaging. In World Environmental and Water Resources Congress 2025.
3. Yin, Z., Leon, A. S., **Sharifi, A.**, & Amini, M. H. (2023). Optimal Control of Combined Sewer Systems to Minimize Sewer Overflows by Using Reinforcement Learning. World Environmental and Water Resources Congress 2023, 711–722. [Link]
4. **Sharifi, A.** (2018), Effect of solenoid magnetic field on aortic artery blood flow, First National Conference on Basic Research in Mechanical Engineering, COI Code: MECHEN01085
5. **Sharifi, A.** (2018), Investigating the efficiency of solar energy storage systems in Iran. First National Conference on Basic Research in Mechanical Engineering. COI Code: MECHEN01165

AWARDS & HONORS

- First Rank in RoboCup Match (2007)
- First Rank in Master's Degree (2016)
- Research Citations:∼2096, H-index: 21

REVIEW RECORDS

- Environmental Science and Pollution Research (20 papers)
- Computers in Biology and Medicine (16 papers)
- Science of the Total Environment (7 papers)
- Environmental Research (5 papers)
- Informatics in Medicine Unlocked (5 papers)
- BioMed Research International (6 papers)
- International Journal of Computer Assisted Radiology and Surgery.(4 papers)
- International Journal of Hygiene and Environmental Health (4 papers)
- Water Resources Management (4 papers)
- Wireless Communications and Mobile Computing (2 papers)
- Cells (1 paper)
- ChemBioEng Reviews (1 paper)
- Computer Science Review (1 paper)
- Concurrency and Computation: Practice and Experience (1 paper)
- Frontiers in Public Health (1 paper)
- Interdisciplinary Perspectives on Infectious Diseases (1 paper)
- International Journal of Communication Systems (1 paper)
- Journal of Medical Virology (1 paper)
- Journal of Thermal Analysis and Calorimetry (1 paper)
- Life (1 paper)
- Multidiscipline Modeling in Materials and Structures (1 paper)
- Risk Management and Healthcare Policy (1 paper)