

Abbas Sharifi, Ph.D.

Postdoctoral Research Associate
Geospatial Data Science Laboratory
Lyles School of Civil and Construction Engineering
Purdue University

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asharifilab.com | [Google Scholar](https://scholar.google.com/citations?user=sharifia) | [GitHub](https://github.com/asharifilab) | [LinkedIn](https://www.linkedin.com/in/abbas-sharifi)
ORCID: 0000-0002-2915-2740 | ResearcherID: O-8093-2016

RESEARCH INTERESTS

Impacts of global environmental change on urban and hydrologic systems; urban heat islands and extreme-heat exposure; land–atmosphere interaction and microclimate processes; hydraulics and hydrologic change, stormwater systems, and water-resources infrastructure; geospatial data science and remote sensing (airborne LiDAR, DEM reconstruction, satellite Earth observation); physically based numerical modeling (CFD, hydraulic and hydrologic simulation); environmental digital twins and sensor-data assimilation for climate-resilient planning; machine learning for Earth-observation and environmental data.

EDUCATION

Florida International University

Ph.D., Civil Engineering (Water Resources Engineering)

Miami, FL, USA

Jan 2022 – May 2025

Dissertation: *Experimental and Numerical Simulation of Storm Sewer Geysers and Design of Retrofitting Systems*

Advisor: Prof. Arturo S. Leon

Project page: asharifilab.com/research

Florida International University

M.S., Environmental Engineering

Miami, FL, USA

Jan 2022 – May 2024

Urmia University of Technology

M.S., Mechanical Engineering (Energy Conversion, Fluid Mechanics, and CFD)

Urmia, Iran

Sep 2014 – Sep 2016

Thesis: *Numerical Study of Magnetic Drug Targeting in Blood Vessels*

Project page: asharifilab.com/research/magnetic-drug-targeting

Urmia University

B.S., Mechanical Engineering

Urmia, Iran

Sep 2010 – Sep 2014

ACADEMIC APPOINTMENTS

Postdoctoral Research Associate

Geospatial Data Science Laboratory, Purdue University

Mar 2026 – Present

West Lafayette, IN

Project page: asharifilab.com/research/cfd-digital-twin

- Lead developer of a cloud-based urban microclimate digital twin integrating airborne LiDAR-derived 3D urban geometry, OpenStreetMap land-cover layers, and a GPU-accelerated three-dimensional Navier–Stokes solver to resolve street-scale temperature and wind fields.
- Conduct research in geospatial data analytics, remote sensing, and infrastructure monitoring for hydrologic and environmental systems, including STAC/Entwine Point Tile LiDAR streaming and DEM reconstruction workflows.
- Develop and implement numerical models of hydrologic and hydraulic processes driven by remote-sensing datasets, and quantify urban heat island intensity and the cooling benefit of green infrastructure at neighborhood scale.
- Perform field investigations, data acquisition, and assimilation of live urban sensor observations into simulation state to support nowcasting and model–observation blending.
- Translate simulation output into planning-relevant thermal comfort and pedestrian-level wind metrics intended for use by municipal planning and public-health stakeholders.

Laboratory Manager I

Department of Civil and Environmental Engineering, Florida International University

Jun 2025 – Mar 2026

Miami, FL

- Provided technical training and experimental design support to undergraduate, graduate, and faculty research projects across the department.

- Directed research and teaching laboratory operations, including instrumentation, equipment, and chemical inventory management.
- Developed and enforced laboratory safety protocols compliant with OSHA and EPA standards and aligned laboratory practice with ABET accreditation criteria.

Graduate Research Assistant

Jan 2022 – Aug 2024

Department of Civil and Environmental Engineering, Florida International University

Miami, FL

Project page: asharifilab.com/research

- Designed, instrumented, and operated small- and large-scale experimental facilities for storm sewer geyser research, including high-speed imaging, pressure transducer arrays, and multiphase flow data acquisition.
- Developed and validated three-dimensional multiphase CFD models in OpenFOAM and designed retrofitting systems to mitigate violent geyser eruptions in urban drainage networks.

Graduate Teaching Assistant

Jan 2022 – May 2024

Department of Civil and Environmental Engineering, Florida International University

Miami, FL

Laboratory Manager, Fluid Mechanics Laboratory

Oct 2016 – Jun 2017

Urmia University of Technology

Urmia, Iran

Instructor, OpenFOAM and C++ Programming

Dec 2015 – Jun 2016

Urmia University of Technology

Urmia, Iran

Graduate Research Assistant

Sep 2014 – Sep 2016

Department of Mechanical Engineering, Urmia University of Technology

Urmia, Iran

GRANTS, FELLOWSHIPS, AND HONORS

Dissertation Year Fellowship (DYF), Florida International University

Aug 2024 – May 2025

Competitive university-wide fellowship supporting completion of doctoral research.

Postdoctoral Fellowship, Institute for Physical Artificial Intelligence (IPAI), Purdue University

March 2026 – Present

A premier U.S. fellowship focused on embedding AI into physical systems

Ranked 1st in Graduating Class, M.S. Mechanical Engineering, Urmia Univ. of Technology

2016

PEER-REVIEWED JOURNAL PUBLICATIONS

34 peer-reviewed journal articles. Citations: 2,500; h-index: 25; i10-index: 31 ([Google Scholar](https://scholar.google.com/citations?user=asharifilab), August 2026).

A. Environmental Change, Urban Climate, and Geospatial Digital Twins

Project page: asharifilab.com/research/cfd-digital-twin

1. **Sharifi, A.**, Tarlani Beris, A., Sharifzadeh Javidi, A., Nouri, M. S., Gholizadeh Lonbar, A., & Ahmadi, M. (2024). Application of artificial intelligence in digital twin models for stormwater infrastructure systems in smart cities. *Advanced Engineering Informatics*, 61, 102485. [\[Link\]](#)
2. 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(2), 44. [\[Link\]](#)
3. Ahmadi, M., Gholizadeh Lonbar, A., Kazemi Naeini, H., Tarlani Beris, A., Nouri, M., Sharifzadeh Javidi, A., & **Sharifi, A.** (2025). Application of segment anything model for civil infrastructure defect assessment. *Innovative Infrastructure Solutions*, 10(7), 269. [\[Link\]](#)

B. Hydrology, Hydraulics, and Water Resources

Project page: asharifilab.com/research

4. **Sharifi, A.**, Mahyawansi, P., Zanje, S. R., & Leon, A. S. (2026). A retrofitting solution for geyser eruptions in storm sewer systems: Experimental and numerical analysis. *Journal of Hydraulic Research*, 1–17. [\[Link\]](#)
5. **Sharifi, A.**, Mahyawansi, P., Zanje, S. R., & 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. [\[Link\]](#)

6. Zanje, S. R., Mahyawansi, P., **Sharifi, A.**, Leon, A. S., Petrov, V., & Infimovskiy, Y. Y. (2024). Mechanistic understanding of field-scale geysers in storm sewer systems using three-dimensional numerical modeling. *Processes*, 13(1), 32. [\[Link\]](#)
7. 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. [\[Link\]](#)
8. 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). [\[Link\]](#)
9. 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(1), 25–38. [\[Link\]](#)
10. Reihanifar, M., Takallou, A., Taheri, M., Gholizadeh Lonbar, A., Ahmadi, M., & **Sharifi, A.** (2024). Nanotechnology advancements in groundwater remediation: A comprehensive analysis of current research and future prospects. *Groundwater for Sustainable Development*, 27, 101330. [\[Link\]](#)

C. Environmental Systems, Climate, and Data-Driven Environmental Modeling

Project page: asharifilab.com/research/covid-research

11. Asadi, S., Kazemi Naeini, H., Hassanlou, D., Pishahang, A., Najafabadi, S. A., **Sharifi, A.**, & Ahmadi, M. (2025). AI-powered digital twin frameworks for smart grid optimization and real-time energy management in smart buildings: A survey. *CMES — Computer Modeling in Engineering and Sciences*, 145(2), 1259–1301. [\[Link\]](#)
12. **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. [\[Link\]](#)
13. Nasirpour, M. H., **Sharifi, A.**, Ahmadi, M., & Jafarzadeh Ghouschi, 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. [\[Link\]](#)
14. 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. [\[Link\]](#)
15. Ahmadi, M., **Sharifi, A.**, Dorosti, S., Jafarzadeh Ghouschi, S., & Ghanbari, N. (2020). Investigation of effective climatology parameters on COVID-19 outbreak in Iran. *Science of the Total Environment*, 729, 138705. [\[Link\]](#)
16. **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. [\[Link\]](#)
17. Jafarzadeh-Ghouschi, 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. [\[Link\]](#)

D. Computational Fluid Dynamics and Transport Processes

Project page: asharifilab.com/research/magnetic-drug-targeting

18. Badfar, H., Yekani Motlagh, S., & **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. [\[Link\]](#)
19. **Sharifi, A.**, Yekani Motlagh, S., & Badfar, H. (2019). Numerical investigation of magnetic drug targeting using magnetic nanoparticles to the aneurysmal vessel. *Journal of Magnetism and Magnetic Materials*, 474, 236–245. [\[Link\]](#)
20. **Sharifi, A.**, Yekani Motlagh, S., & Badfar, H. (2019). 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. [\[Link\]](#)
21. Yekani Motlagh, S., **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. [\[Link\]](#)
22. **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. [\[Link\]](#)
23. Badfar, H., Yekani Motlagh, S., & **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(10), 440. [\[Link\]](#)

E. Additional Publications — Biomedical Imaging, Health Informatics, and Applied Machine Learning

Project page: asharifilab.com/research/medical-image-processing

24. Ahmadi, M., Fatemi Nia, M., Asgarian, S., Danesh, K., Irankehah, E., Gholizadeh Lonbar, A., & **Sharifi, A.** (2025).

Comparative analysis of Segment Anything Model and U-Net for breast tumor detection in ultrasound and mammography images. *Computational Intelligence*, 41(5), e70145. [\[Link\]](#)

25. 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. [\[Link\]](#)
26. **Sharifi, A.**, Ahmadi, M., Mehni, M. A., Jafarzadeh Ghouschi, 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. [\[Link\]](#)
27. Davoudi, A., Ahmadi, M., **Sharifi, A.**, Hassantabar, R., Najafi, N., & Tayebi, A. (2021). Studying the effect of taking statins before infection in the severity reduction of COVID-19 with machine learning. *BioMed Research International*, 2021. [\[Link\]](#)
28. Hosseini Abadi, M. Q., 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. [\[Link\]](#)
29. Varmaghani, A., Matin Nazar, A., Ahmadi, M., **Sharifi, A.**, Jafarzadeh Ghouschi, 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. [\[Link\]](#)
30. 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. [\[Link\]](#)
31. 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. [\[Link\]](#)
32. 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*, 140, 110170. [\[Link\]](#)
33. Dorosti, S., Jafarzadeh Ghouschi, S., 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. [\[Link\]](#)
34. Ahmadi, M., Jafarzadeh-Ghouschi, S., Taghizadeh, R., & **Sharifi, A.** (2019). Presentation of a new hybrid approach for forecasting economic growth using artificial intelligence approaches. *Neural Computing and Applications*, 32, 7989–8009. [\[Link\]](#)

MANUSCRIPTS UNDER REVIEW

1. **Sharifi, A.**, Zanje, S. R., Mahyawansi, P., & Leon, A. S. (2026). Understanding the physical processes in storm sewer geysers using experimental and numerical time traces of superficial flow characteristics. Under review, *Journal of Hydraulic Research*.

PREPRINTS

1. **Sharifi, A.**, Kazemi Naeini, H., Ahmadi, M., Asadi, S., & Varmaghani, A. (2025). Multi-objective optimization of water resource allocation for groundwater recharge and surface runoff management in watershed systems. arXiv:2502.15953. [\[Link\]](#)
2. Mahyawansi, P., Zanje, S. R., **Sharifi, A.**, McDaniel, D., & Leon, A. S. (2025). A novel hypothesis of violent storm sewer geyser. Research Square preprint. [\[Link\]](#)
3. Yekani Motlagh, N., Khajavi, M., **Sharifi, A.**, & Ahmadi, M. (2023). The impact of artificial intelligence on the evolution of digital education: A comparative study of OpenAI text generation tools including ChatGPT, Bing Chat, Bard, and Ernie. arXiv:2309.02029. [\[Link\]](#)

CONFERENCE PROCEEDINGS AND PRESENTATIONS

1. **Sharifi, A.**, Zanje, S. R., Mahyawansi, P., Petrov, V., & Leon, A. S. (2025). Real-time air–water volume fraction prediction using deep learning and high-speed imaging. *World Environmental and Water Resources Congress 2025*, ASCE, 471–485. [\[Link\]](#)
2. **Sharifi, A.**, Zanje, S. R., Mahyawansi, P., & Leon, A. S. (2024). Numerical investigation of the physical mechanisms behind geysers in storm sewer systems: A slug analysis based on a computational study of geyser eruptions. *World*

Environmental and Water Resources Congress 2024, ASCE, 835–845. [\[Link\]](#)

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*, ASCE, 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*, Iran. COI: MECHEN01085.
5. **Sharifi, A.** (2018). Investigating the efficiency of solar energy storage systems in Iran. *First National Conference on Basic Research in Mechanical Engineering*, Iran. COI: MECHEN01165.

RESEARCH PRODUCTS, SOFTWARE, AND DATA

GDSL Urban Microclimate Digital Twin — Lead Developer

2026 – Present

Project page: asharifilab.com/research/cfd-digital-twin

- Full-stack, cloud-accessible urban microclimate simulation platform delivering physically based CFD to a web browser. Architecture: CesiumJS 3D globe client, Node.js/Express server, Python GPU solver (CuPy/NumPy), Flask AI segmentation service, and SSH-tunneled HPC back end.
- Three-dimensional incompressible Navier–Stokes solver under the Boussinesq approximation coupled to a temperature advection–diffusion equation, a porous-media canopy drag and evaporative cooling model, a column-based solar radiation and shading model, and relaxation-nudging assimilation of live sensor observations.
- Geospatial data pipeline: STAC-API and Entwine Point Tile (EPT) LiDAR streaming with spatial cropping, AI semantic segmentation of point clouds into ground/building/vegetation classes, DEM reconstruction, and OpenStreetMap building, canopy, road, and hydrography layers. Demonstration domain: Hamilton County, Indiana.

Autonomous Surface-Water Debris Collection Robot

2022 – 2025

Project page: asharifilab.com/research/seawater-robot

- IoT and AI-enabled surface-water robot (Raspberry Pi 4, YOLOv5 detection, GPS waypoint navigation, cellular telemetry) with custom operator software for mission planning, live detection, and collection analytics.

Large-Scale Mixed-Flow Open-Channel Experimental Facility

2022 – 2025

Project page: asharifilab.com/research

- Designed and instrumented a large-scale physical model of mixed flow in open channels at Florida International University; benchmark datasets used to validate and correct the Illinois Transient Model (ITM) in partnership with Wade Trim, Inc.
- Code repositories: github.com/AbbasSharifi16

High-Performance Computing Cluster — Project Lead

Mar 2016

- Led design and implementation of a Linux-based computer-clustering HPC system for academic and research centers at Urmia University of Technology.

TEACHING EXPERIENCE

Graduate Teaching Assistant, Florida International University

Jan 2022 – May 2024

Department of Civil and Environmental Engineering

Miami, FL

Spring 2024: CWR 3201 Fluid Mechanics; EGN 4070 Engineering for Global Sustainability and Environmental Protection

Summer 2023: CWR 3201 Fluid Mechanics

Summer 2022: ENV 3001 Introduction to Environmental Engineering; ENV 3001L Environmental Engineering Laboratory

Spring 2022: EGN 4070 Engineering for Global Sustainability and Environmental Protection; ENV 4101 Fundamentals of Air Pollution Engineering; ENV 4551 Wastewater Treatment Engineering

Instructor, Urmia University of Technology

Dec 2015 – Jun 2016

OpenFOAM and C++ Programming — designed and delivered a standalone course in open-source computational fluid dynamics for graduate students.

Laboratory Instructor, Urmia University of Technology

Oct 2016 – Jun 2017

Fluid Mechanics Laboratory — experiment design, instruction, and assessment.

APPLIED RESEARCH PARTNERSHIPS AND PUBLIC ENGAGEMENT

Industry Research Partnership — Wade Trim, Inc.

2022 – 2025

Department of Civil and Environmental Engineering, Florida International University

Miami, FL

Project page: asharifilab.com/research

- Collaborated with Wade Trim, a national engineering and planning consultancy, on experimental research directly informing municipal stormwater and combined-sewer practice.
- Designed, built, and instrumented a large-scale experimental facility for mixed flow in open channels, generating benchmark datasets used to validate and correct the Illinois Transient Model (ITM) software for transient mixed-flow simulation in sewer systems.
- Translated laboratory findings into model corrections and retrofitting recommendations intended for practitioner use in urban drainage design and geyser-hazard mitigation.

Autonomous Surface-Water Robot for Debris and Algae Collection

2022 – 2025

Designer and Lead Developer · Florida International University

Miami, FL

Project page: asharifilab.com/research/seawater-robot

- Designed and prototyped an IoT-enabled autonomous robot for coastal and surface-water debris and algae collection, addressing a visible local environmental problem in the Miami coastal zone.
- Integrated a Raspberry Pi 4 control platform, YOLOv5 real-time object detection, high-precision GPS waypoint navigation, HD wide-angle vision, and a motorized collection conveyor, with WiFi and cellular telemetry for remote operation.
- Developed a full operator interface providing live detection overlay, mission planning for autonomous patrol of defined collection zones, system diagnostics, and analytics on route efficiency and collection performance.

Public Communication and Outreach

- Featured guest, *Innovation Alley* video podcast, Wade Trim, Inc. — public-facing discussion of stormwater research and urban water infrastructure innovation for a professional and general audience.

PROFESSIONAL SERVICE

Editorial Service

- Guest Editor, *Pharmaceutics*, Special Issue: “Advances in Drug Targeting Chemistry and Magnetic Fluid Dynamics for Enhanced Therapeutic Efficacy” (current). [\[Link\]](#)
- Guest Editor, *Journal of Healthcare Engineering*, Special Issue: “Complexity Systems for Scheduling in Healthcare” (Aug 2022 – May 2024). [\[Link\]](#)
- Editorial handling record: 6 manuscripts.

Peer Review

- 84 manuscript reviews across 28 journals (2019 – present). Principal venues: *Environmental Science and Pollution Research* (20), *Computers in Biology and Medicine* (16), *Science of the Total Environment* (7), *BioMed Research International* (6), *Environmental Research* (5), *Informatics in Medicine Unlocked* (5), *Water Resources Management* (4), *International Journal of Hygiene and Environmental Health* (4), *International Journal of Computer Assisted Radiology and Surgery* (4).
- Additional review service for *Cells*, *ChemBioEng Reviews*, *Computer Science Review*, *Concurrency and Computation*, *Frontiers in Public Health*, *Interdisciplinary Perspectives on Infectious Diseases*, *International Journal of Communication Systems*, *Journal of Medical Virology*, *Journal of Thermal Analysis and Calorimetry*, *Life*, *Multidiscipline Modeling in Materials and Structures*, *Risk Management and Healthcare Policy*, and *Wireless Communications and Mobile Computing*.
- Web of Science Academy graduate and peer-review mentor (2019 – present) — trained and mentored early-career researchers in peer-review practice. [\[Link\]](#)

Conference and Institutional Service

- Advisory Board, *2nd International Conference on Artificial Intelligence Science and Applications in Industry and Society* (CAISAIS 2023). [\[Link\]](#)
- Laboratory safety and ABET accreditation compliance lead, Department of Civil and Environmental Engineering, Florida International University (2025–2026).

TECHNICAL SKILLS

Geospatial and Remote Sensing: Airborne LiDAR processing (Entwine Point Tiles, STAC API, point-cloud classification), DEM reconstruction and terrain analysis, OpenStreetMap data integration, CesiumJS 3D geospatial visualization, WGS84 coordinate systems, GIS workflows.

Hydrologic and Hydraulic Modeling: HEC-RAS, HEC-HMS, SWMM, transient and multiphase sewer-network modeling.

Computational Fluid Dynamics: OpenFOAM (solver development in C++), ANSYS Fluent, custom finite-difference and finite-volume Navier–Stokes solvers, VOF multiphase methods, Boussinesq buoyancy and porous-media models.

Programming and HPC: Python (NumPy, SciPy, CuPy, Flask), C++, MATLAB, R, JavaScript/Node.js/Express; GPU acceleration (CUDA via CuPy), Linux cluster administration, SLURM-style job scheduling, SSH/paramiko HPC integration.

Machine Learning and Image Analysis: Convolutional neural networks, semantic segmentation (U-Net, Segment Anything Model), deep neural networks for regression and classification, high-speed image analysis, computer vision for infrastructure and point-cloud data.

Statistics and Analysis: R, Minitab, SPSS; sensitivity analysis, gene expression programming, time-series and autoregressive modeling.

Experimental and Field Instrumentation: Data acquisition systems, pressure transducers, high-speed imaging, environmental sensor networks and IoT telemetry, Arduino, Raspberry Pi, autonomous surface-water robotics prototyping.

Design and Visualization: SolidWorks, Qt Designer, Adobe Illustrator.

REFERENCES

Jinha Jung, Ph.D.

Postdoctoral supervisor

Associate Professor, Lyles School of Civil and Construction Engineering, Purdue University
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Arturo S. Leon, Ph.D., P.E., D.WRE

Doctoral advisor

Professor, Department of Civil and Environmental Engineering, Florida International University
10555 W Flagler Street, Miami, FL 33174 · (217) 979-2706 · arleon@fiu.edu

Hooman Vatankhah, Ph.D.

Departmental colleague

Assistant Professor, Department of Civil and Environmental Engineering, Florida International University
10555 W Flagler Street, Miami, FL 33174 · (305) 348-2824 · hvatankh@fiu.edu