Curriculum Vitae

(November 2026)

Ali Reza Shahvaran (He/Him), MSc

Water Resources and Hydrology (WRH) Research Group
Department of Civil & Mineral Engineering
University of Toronto
Toronto, Ontario, Canada

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LinkedIn | GitHub | Google Scholar

Current Position

PhD Student, University of Toronto, Toronto, Ontario, Canada

Summary of Qualifications

• Over 5 years of combined research and industry experience in hydrologic and water quality modeling, remote sensing, GIS, environmental monitoring and climate change impact assessment.
• Proficient in Python, R, and MATLAB, with applied hydrologic and hydraulic modeling expertise in HEC-HMS, HEC-RAS, Raven, PCSWMM/SWMM, and SWAT+, complemented by remote sensing and GIS tools (ENVI, ArcGIS Pro, ESA SNAP).
• Published researcher with articles in high-impact journals, and experience presenting at international conferences, demonstrating strong communication and scientific dissemination skills.
• Recipient of prestigious scholarships and awards, reflecting academic excellence and dedication to Earth and Environmental Sciences.
• Extensive laboratory and field expertise in water quality measurements and instrumentation, complemented by leadership roles as a teaching assistant and active participation in professional societies.
• Certified in advanced machine learning and deep learning, enhancing capabilities in hydroinformatics as well as data-driven environmental modeling applications.
• Strong project management and problem-solving skills, demonstrated through supervising environmental engineering projects and developing decision support tools for sustainability assessment.

Research Interests

Water Resources Management; Hydrologic & Hydraulic Modeling; Water Quality Monitoring and Modeling; Environmental Remote Sensing (RS), Geographic Information Systems (GIS) & Photogrammetry; Climate Change Impact Assessment & Adaptation; Machine Learning & Deep Learning in Environmental Sciences; Hydroinformatics

Education

PhD, Civil Engineering — May 2026–Present
University of Toronto, Toronto, Ontario, Canada
Supervisor: Prof. Mohammed Basheer

MSc, Earth Sciences - Water — Sep 2021–Apr 2024
University of Waterloo, Waterloo, Ontario, Canada
GPA: 90/100 (≈ A+ or 4.0/4.0)
Thesis: Chlorophyll-a Mapping in a Large Lake Using Remote Sensing Imagery: A Case Study of Western Lake Ontario
Supervisors: Prof. Philippe Van Cappellen, Prof. Homa Kheyrollah Pour

MSc, Civil Engineering - Environmental — Sep 2018–Aug 2021
Iran University of Science and Technology, Tehran, Tehran, Iran
GPA: 19.10/20.00 (Summa Cum Laude) (≈ A+ or 4.0/4.0 or 95/100)
Thesis: Designing and Developing a WebGIS-Based Decision Support Tool for Sustainability Assessment of Water-Energy-Food Nexus — Summa Cum Laude (Honor)
Supervisors: Prof. Motahareh Saadatpour, Prof. Mario Giampietro

BSc, Civil Engineering — Sep 2014–Mar 2018
Persian Gulf University, Bushehr, Bushehr, Iran
GPA: 17.17/20.00 (Magna Cum Laude) (≈ A- or 3.7/4.0 or 86/100)

Work Experience

Research Assistant II (Geomatics Technician) May 2024–Apr 2026

Ecohydrology Research Group, University of Waterloo, Waterloo, Ontario, Canada

Duties:

• Developed and calibrated PCSWMM hydrological models of stormwater management ponds in Kitchener, ON, to simulate urban runoff and storage dynamics.

• Installed and maintained automated loggers, water quality sensors, and conducted field sampling of water and sediments for laboratory analysis of nutrients and water chemistry parameters.

• Curated and processed multi-source geospatial datasets and optical and thermal imagery from space- and airborne platforms to develop environmental and water quality models calibrated with in-situ matchups.

• Designed and implemented machine learning and deep learning workflows to predict greenhouse-gas fluxes, microplastic loads, and other biogeochemical variables on local or global scales.

• Performed GIS-based susceptibility and risk assessments for urban eutrophication and natural hazards under varying climate-change and land use scenarios.

• Retrieved, harmonized, and analyzed global and continental-scale hydrometeorological datasets for environmental modeling.

• Classified high-resolution aerial imagery to produce land use land cover (LUCL) maps using supervised classification techniques.

• Pulled water-quality data from DataStream and discharge records from HYDAT via APIs, then applied the Canadian Lake River Hydrofabric (CLRH) GIS layer to spatially co-register and clean time-series datasets for chemical-load calculations in Lake Winnipeg Basin rivers.

Projects:

• Chemical Load Assessments for Watersheds: Automation and Visualization Experience (CLAWAVE)

• Adaptive management of green stormwater infrastructure to reduce greenhouse gas emissions from urban watersheds

• The Microplastics Fingerprinting at the watershed scale: from sources to receivers

• Managing Urban Eutrophication Risks under Climate Change: An Integrated Modeling and Decision Support Framework

Research Assistant Feb 2020–Feb 2021

Iran University of Science and Technology, Tehran, Tehran, Iran

Duties:

• Extracted and processed time-series radar and optical satellite imagery to delineate long-term dynamics and seasonality in wetland water extent.

• Retrieved and analyzed soil-moisture products from SMAP and other remote sensing platforms for hydrological assessment.

• Derived water-surface temperatures from thermal-infrared satellite bands to evaluate the wetland's thermal dynamics.

• Delineated the Meighan Wetland's immediate watershed by integrating digital elevation models and land use land cover layers.

• Assisted in drafting the environmental assessment report for the Department of Environment (Iran), summarizing analytical results, as well as management recommendations.

Project: The Environmental Report on the Meighan Wetland

Supervising Environmental Engineer Sep 2019–Nov 2019

S.A.P. Consulting Engineers Co., Tehran, Tehran, Iran

Duties: Supervised municipal solid-waste characterization surveys and coordinated laboratory analyses—including moisture content, calorific value, and leachate quality testing.

Project: Tehran Integrated Waste Management Master Plan

Intern Civil Engineer Jun 2017–Sep 2017

ATEC Consultants, Shiraz, Fars, Iran

Teaching Experience

Graduate/Lead Teaching Assistant

University of Toronto, Toronto, Ontario, Canada Aug 2026–Present

Duties:

• Delivered lectures and field tutorials on water quality sampling from monitoring wells, streams, and lakes for 60 students at CME358 Survey CAMP, a two-week field course at the U of T Camp facility on the shore of Gull Lake in Minden, Ontario.

• Instructed student crews on-site in the use of YSI multiparameter sondes, Van Dorn samplers, and Heron water level meters for in-situ measurement, depth profiling, and water level surveys.

• Ran lab tutorials on sample handling and the determination of water quality parameters using a Hach spectrophotometer.

• Supervised daily field rotations and led project assessment review meetings, providing technical guidance and feedback throughout.

Courses: Survey CAMP: Civil and Mineral Practicals (CME358H1F); Hydraulics and Hydrology (CIV250H1S); Spatial Data Science II (GGR376H5S); Critically Thinking about Climate Solutions (ENV301H1F)

University of Waterloo, Waterloo, Ontario, Canada Jan 2023–Dec 2023

Duties:

• Led ArcGIS Pro software tutorials.

• Graded assignments and exams, providing constructive feedback.

• Hosted weekly office hour Q&A sessions.

• Prepared lab setups, enforced safety protocols, and assisted students during practicals.

Courses: Rock Mechanics (EARTH 437), Geomorphology and GIS Applications (EARTH 342)

Graduate/Senior Teaching Assistant Sep 2019–Feb 2021

Iran University of Science and Technology, Tehran, Tehran, Iran

Duties:

• Led CE-QUAL-W2 and QUAL2K software tutorials for water quality modeling.

• Led Vensim software tutorials for system dynamics modeling.

• Designed and graded exams and homework assignments, providing constructive feedback.

• Hosted weekly office hour Q&A sessions.

Courses: Hydroinformatics; Water Quality Control; Sustainable Development and Environmental Management; Fundamentals of Advection, Diffusion and Pollution Modeling

Selected Awards & Scholarships

Edwin Edward Hart Graduate Award	Nov 2026
Department of Civil & Mineral Engineering, University of Toronto	CAD $9,000
James Armstrong Civil Engineering Graduate Scholarship	Sep 2026
Department of Civil & Mineral Engineering, University of Toronto	CAD $4,000
Graduate Research Studentship (GRS)	Sep 2021–Apr 2024
Department of Earth and Environmental Sciences, University of Waterloo	CAD $102,154
International Master's Award of Excellence (IMAE)	Sep 2021–Apr 2023
Graduate Studies and Postdoctoral Affairs (GSPA), University of Waterloo	CAD $12,500
Science Graduate Award (SGA)	Sep 2021–Aug 2023
Faculty of Science, University of Waterloo	CAD $7,125
Global Water Futures Young Professionals (GWF YP) Travel Grant	Feb 2023
Global Water Futures, University of Saskatchewan	CAD $500
Graduate Scholarship	Jan 2022–Apr 2023
Department of Earth and Environmental Sciences, University of Waterloo	CAD $1,389

Competitions

AquaHacking Binational Challenge 2026 – Semi-Finalist 2026

Great Lakes & St. Lawrence, AquaAction

Team ReserVision: Elham Soleimanian, **Ali Reza Shahvaran**, Hamid Arzani

Description: Built the geospatial engine for a reservoir management platform linking irrigation reservoirs to their command areas via cost-distance modeling over terrain, canal, and crop datasets, feeding adaptive release scheduling. Validated against ground-truth data in the USA and India.

Services, Committee & Panel Assignments

Member, Graduate Student Advisory Committee (GSAC) Sep 2026–Present
School of Graduate Studies (SGS), University of Toronto, Toronto, Ontario, Canada
Duties: Advise the Dean of SGS and Vice-Provost, Graduate Research and Education (Prof. Joshua Barker) on academic and campus life issues facing graduate students. Meet monthly as part of a selected group of graduate students representing all four SGS divisions and the three University of Toronto campuses.

Selected Publications

Peer-Reviewed Journal Publications

Total citations: 208, *h*-index: 8 (as of *November 10, 2026*, based on Google Scholar)

14. Mosallanejad, A., **Shahvaran, A. R.**, Khosravi, K.*, Hatamiafkoueieh, J., & Bateni, S. M. (2026). Mapping potential recurring risk of wildfire across Canada using artificial intelligence: implications for human populations and tree species. *Expert Systems with Applications*, 134428. https://doi.org/10.1016/j.eswa.2026.134428
13. Hettinga, E. K.*, Rezanezhad, F., **Shahvaran, A. R.**, Reshadi, M. A. M., Strack, M., Arndt, K. A., ... & Van Cappellen, P. (2026). Evaluating modeling approaches for estimating net ecosystem exchange in Canadian peatlands. *Scientific Reports*. https://doi.org/10.1038/s41598-026-67275-6
12. Reshadi, M. A. M.*, Rezanezhad, F., Kaykhosravi, S., Nguyen, T. H., Slowinski, S., **Shahvaran, A. R.**, Alcott, L., Puopolo, M., Lam, B., & Van Cappellen, P. (2026). Yields and Stormwater Loads of Microplastics in Five Urban Stormwater Catchments (City of Kitchener, Ontario, Canada). *Water Research*, 125804. https://doi.org/10.1016/j.watres.2026.125804
11. **Shahvaran, A. R.***, Chegoonian, A. M., Kheyrollah Pour, H., Reshadi, M. A. M., & Van Cappellen, P. (2026). Multi-Source Assessment of Machine Learning Models and Atmospheric Correction Products for Chlorophyll-*a* Retrieval in Meso-Eutrophic Waters: Application to Hamilton Harbour, an Area of Concern in Lake Ontario, Canada. *IEEE Transactions on Geoscience and Remote Sensing*. https://doi.org/10.1109/TGRS.2026.3676135
10. Zhou, B.*, Radosavljevic, J., Parsons, C. T., Rezanezhad, F., MacVicar, B., Pi, K., Deng, Y., **Shahvaran, A. R.**, Slowinski, S., Gharabaghi, B., & Van Cappellen, P. (2026). Phosphorus in urban stormwater runoff: a review of sources, transport pathways, and control solutions. *Environmental Reviews*, *34*, 1-24. https://doi.org/10.1139/er-2025-0247
9. Mahdian, M., Noori, R.*, Saravani, M. J., **Shahvaran, A. R.**, Shahmohammad, M., Gaffney, P. P., Salamattalab, M. M., Shamsi Anboohi, M., Hosseinzadeh, M., Xia, F., Zhou, Y., Zhang, Y., Kolehmainen, M., & Abolfathi, S. (2026). Linking Hypolimnion to Epilimnion in a Stratified Arctic Lake: Machine Learning-Based Estimation of Hypolimnetic Water Quality from Epilimnetic Measurements. *Water Research*, 125367. https://doi.org/10.1016/j.watres.2026.125367
8. Persaud, B. D.*, **Shahvaran, A. R.**, Attiah, G., Chasmer, L. E., English, M. C., Kheyrollah Pour, H., & Wolfe, B. B. (2025). Trend Analysis of Surface Shortwave (Solar) Radiation in Continental Northwest Territories, Canada (1980–2023). *Journal of Climate*, *38*(19), 5241-5263. https://doi.org/10.1175/JCLI-D-25-0123.1
7. Khosravi, K.*, Farooуqe, A. A., **Shahvaran, A. R.**, Daggupati, P., Heddam, S., & Hatamiafkoueieh, J. (2025). Beyond conventional modeling: A cutting-edge hybrid IAER-AMT decision-tree-based algorithm for high-resolution river turbidity prediction. *Ain Shams Engineering Journal*, *16*(9), 103511. https://doi.org/10.1016/j.asej.2025.103511
6. Khosravi, K., Mosallanejad, A., Bateni, S. M., Kim, D., Jun., C.*, **Shahvaran, A. R.**, Farooque, A. A.*, Karbasi, M., & Ali, M. (2025). Assessing Pan-Canada wildfire susceptibility by integrating satellite data with novel hybrid deep learning and black widow optimizer algorithms. *Science of The Total Environment*, *977*, 179369. https://doi.org/10.1016/j.scitotenv.2025.179369
5. **Shahvaran, A. R.***, Kheyrollah Pour, H., Binding, C., & Van Cappellen, P. (2025). Mapping satellite-derived chlorophyll-*a* concentrations from 2013 to 2023 in Western Lake Ontario using Landsat 8 and 9

imagery. *Science of the Total Environment*, *968*, 178881. https://doi.org/10.1016/j.scitotenv.2025.178881

4. Reshadi, M. A. M.*, Rezanezhad, F., **Shahvaran, A. R.**, Ghajari, A., Kaykhosravi, S., Slowinski, S., & Van Cappellen, P. (2025). Assessment of environmental and socioeconomic drivers of urban stormwater microplastics using machine learning. *Scientific Reports*, *15*(1), 6299. https://doi.org/10.1038/s41598-025-90612-0
3. Saravani, M. J., Saadatpour, M.*, & **Shahvaran, A. R.** (2024). A web GIS based integrated water resources assessment tool for Javeh Reservoir. *Expert Systems with Applications*, *252*, 124198. https://doi.org/10.1016/j.eswa.2024.124198
2. **Shahvaran, A. R.***, Kheyrollah Pour, H., & Van Cappellen, P. (2024). Comparative Evaluation of Semi-Empirical Approaches to Retrieve Satellite-Derived Chlorophyll-*a* Concentrations from Nearshore and Offshore Waters of a Large Lake (Lake Ontario). *Remote Sensing*, *16*(9), 1595. https://doi.org/10.3390/rs16091595
1. Ardakani, A. H. H., Shojaei, S.*, **Shahvaran, A. R.**, Kalantari, Z., Cerdà, A., & Tiefenbacher, J. (2022). Selecting potential locations for groundwater recharge by means of remote sensing and GIS and weighting based on Boolean logic and analytic hierarchy process. *Environmental Earth Sciences*, *81*, 1-19. https://doi.org/10.1007/s12665-021-10071-4

Table 1. Summary of Peer-Reviewed Journal Publications.

Journal	Publisher	Impact Factor (2025)	Publications
Water Research	Elsevier	12.8	2
IEEE Transactions on Geoscience and Remote Sensing	IEEE	9.4	1
Expert Systems with Applications	Elsevier	9.4	2
Environmental Reviews	CSP	6.3	1
Ain Shams Engineering Journal	Elsevier	6.2	1
Scientific Reports	Springer Nature	4.9	2
Remote Sensing	MDPI	4.3	1
Journal of Climate	AMS	4.3	1
Environmental Earth Sciences	Springer Nature	3.3	1
Science of The Total Environment	Elsevier	N/A	2
		Total	14

Datasets

10. Starling, N., **Shahvaran, A. R.**, Persaud, B., Bu, X., Van Cappellen, P. (2026). Daily Dataset of Spatially Paired River Water Quality, Discharge, and Estimated Loads across Canada, 1980–2025. *Federated Research Data Repository*. https://doi.org/10.20383/103.01660
9. Persaud, B. D., Jenkins, T., Attiah, G., Bredahl, L., **Shahvaran, A. R.**, Waslander, E., Twum, K. O., Rezanezhad, F., Kheyrollah Pour, H., Van Cappellen, P. (2026). Data Availability in Canadian Arctic Scholarship. *Federated Research Data Repository*. https://doi.org/10.20383/103.01682
8. **Shahvaran, A. R.**, Noori, R., Basheer, M., Madani, K., Mi, C., Shi, K., Zhou, Y., Woolway, R. I., Zhang, Y., Qin, B., AghaKouchak, A., & van Vliet, M. T. H. (2026). Global Daily Satellite-Derived Lake Surface Water Quality Dataset (2002-2022) (1.0.0) [Data set]. *Zenodo*. https://doi.org/10.5281/zenodo.20347115
7. Persaud, B. D., Attiah, G., Kalamandeen, M., **Shahvaran, A. R.**, Radosavljevic, J., Alves, L., Hamer, E., Maharaj, G., Hastings, R., Kheyrollah Pour, H., & Van Cappellen, P. (2025). High-Resolution (1 km) Daily Climate Gridded Dataset for Guyana (1950–2024). *Federated Research Data Repository*. https://doi.org/10.20383/103.01185
6. Radosavljevic, J., **Shahvaran, A. R.**, Parsons, C., Pi, K., Rezanezhad, F., Deng, Y., Van Cappellen, P. (2025). Beyond Climate Warming: How Salinization Accelerates Deoxygenation in Lakes. *Federated Research Data Repository*. https://doi.org/10.20383/103.01536
5. Reshadi, M. A. M., Rezanezhad, F., **Shahvaran, A. R.**, Ghajari, A., Kaykhosravi, S., Slowinski, S., & Van Cappellen, P. (2025). A Deployable Model and Global Dataset on Stormwater Microplastic Concentrations and Drivers. *Federated Research Data Repository*. https://doi.org/10.20383/103.01159
4. Persaud, B. D., **Shahvaran, A. R.**, Attiah, G., Chasmer, L., English, M., Kheyrollah Pour, H., & Wolfe, B. (2025). Data and Analysis Code for Long-Term Trend and Correlation Analysis of Daymet Shortwave Radiation, CERES Solar Insolation, ERA5 Total Cloud Cover, MODIS Cloud Fraction, In-situ Cloud Cover Observations, and Landsat Lake Surface Water Temperature in Northwest Territories (NWT), Canada (1980–2023). *Federated Research Data Repository*. https://doi.org/10.20383/103.01165

3. **Shahvaran, A. R.**, Kheyrollah Pour, H., Binding, C., & Van Cappellen, P. (2025). Time-Series Analysis of RS-Derived Chl-a Concentrations from 2013 to 2023 in Western Lake Ontario Using Landsat 8-9 Imagery. *Federated Research Data Repository*. https://doi.org/10.20383/103.0896
2. **Shahvaran, A.R.**, Kheyrollah Pour, H., Slowinski, S., Maclean, A., Rezanezhad, F., & Van Cappellen, P. (2024). Water Quality Measurements from Western Lake Ontario with Synchronous Co-located Multispectral UAV and Satellite Data from 2022-06-14. *Federated Research Data Repository*. https://doi.org/10.20383/103.0796
1. **Shahvaran, A.R.**, Kheyrollah Pour, H., & Van Cappellen, P. (2024). In-Situ Chl-a Concentrations and Co-Located Atmospherically Corrected Satellite Products for Western Lake Ontario from 2000-2022. *Federated Research Data Repository*. https://doi.org/10.20383/102.0713

Selected Presentations

Oral Presentations

6. Radosavljevic, J.*, **Shahvaran, A. R.**, Rezanezhad, F., Passeport, E., Slowinski, S., & Van Cappellen, P. (2025, April). The Global Importance of CO2 and CH4 Emissions from Ponds: A Large-Scale Data Perspective. In *EGU General Assembly 2025* (No. EGU25-13596). https://doi.org/10.5194/egusphere-egu25-13596
5. Alcott, L. J.*, **Shahvaran, A. R.**, Rezanezhad, F., & Van Cappellen, P. (2023, July). Direct Microplastic Inputs from Wastewater Treatment Plants to the Laurentian Great Lakes. In *Goldschmidt 2023 Conference*. https://doi.org/10.7185/gold2023.18477
4. **Shahvaran, A.R.***, Kheyrollah Pour, H., & Van Cappellen P. (2023, June). Evaluation of Multispectral Air- and Space-borne Chlorophyll-*a* Products for Remote Monitoring of Eutrophication in Western Lake Ontario. In *44th Canadian Symposium on Remote Sensing*. https://csrs2023.exordo.com/files/papers/160/final_draft/CSRS_2023_AliReza_pvc_revised.pdf
3. **Shahvaran, A.R.***, Kheyrollah Pour, H., & Van Cappellen P. (2023, May). Potential of multispectral satellite and UAV imagery for nearshore water quality monitoring. In *IAGLR*. https://iaglr.confex.com/iaglr/2023/meetingapp.cgi/Paper/1761
2. **Shahvaran, A. R.***, Kheyrollah Pour, H., & Van Cappellen, P. (2022, December). Evaluation of Atmospheric Correction Processors and Semi-Empirical Algorithms for Retrieval of Chlorophyll-a Concentrations from Multi-Spectral Satellite Imagery over Western Lake Ontario. In *AGU Fall Meeting Abstracts* (Vol. 2022, pp. H33E-07). https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1152585
1. Saravani, M. J.*, Saadatpour, M., & **Shahvaran, A. R.** (2022, December). Developing A Machine Learning-Based Web Tool for Monitoring Eutrophication and Water Quantity Indices: A Case Study of Javeh Reservoir. In *AGU Fall Meeting Abstracts* (Vol. 2022, pp. H11I-03). https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1191987

Poster Presentations

3. Radosavljevic, J.*, **Shahvaran, A. R.**, Passeport, E., Slowinski, S., Rezanezhad, F., Deng, Y., & Van Cappellen, P. (2025, July). Land use and water chemistry as key controls on global carbon greenhouse gas emissions from ponds. In *Goldschmidt 2025 Conference*. https://conf.goldschmidt.info/goldschmidt/2025/meetingapp.cgi/Paper/31335
2. Reshadi, M. A. M.*, Rezanezhad, F., Kaykhosravi, S., Nguyen, T. H., Slowinski, S., **Shahvaran, A. R.**, Alcott, L., Puopolo, M. & Van Cappellen, P. (2025, May). Microplastic Emissions and Retention in Urban Catchments and Stormwater Ponds. In *EGU General Assembly 2025* (No. EGU25-4437). https://doi.org/10.5194/egusphere-egu25-4437
1. Alcott, L. J.*, **Shahvaran, A.R.**, Rezanezhad, F., & Van Cappellen, P. (2023, May). Direct Wastewater Treatment Plant Inputs of Microplastics to the Laurentian Great Lakes. In *IAGLR*. https://iaglr.confex.com/iaglr/2023/meetingapp.cgi/Paper/1836

Outreach

Interviews

2. Featured in 'Member Spotlight', Lake & Reservoir Management Specialist Group Newsletter, International Water Association, October 2026. [Access Link]
1. Featured in 'Members News', Lakes Letter, International Association for Great Lakes Research, Spring 2023. [Access Link]

Developed Software & Tools

11. Math Playground 2026
    Description: Interactive, parameter-driven visualizations of classic results in probability, from a Galton board and Buffon's needle to Monte Carlo π, the arcsine law, and diffusion-limited aggregation, each converging to a verifiable value.
    Developers: **Ali Reza Shahvaran**
    URL: https://arshahvaran.github.io/math_playground
10. BC Wildfire Susceptibility Explorer 2026
    Description: An Earth Engine app for reading calibrated, uncertainty-aware wildfire ignition susceptibility maps of British Columbia.
    Developers: **Ali Reza Shahvaran**, Roohollah Noori, Sayed M. Bateni, Changhyun Jun, Kaveh Madani, Mojtaba Sadegh, Amir AghaKouchak
    URL: https://ee-arshahvaran.projects.earthengine.app/view/bc-wildfire
9. Hydrograph Metrics Explorer (HME) 2026
    Description: A browser-based evaluation tool that computes timing- and shape-aware hydrograph metrics alongside conventional ones such as NSE and KGE, updating every metric live as users shift, scale, or offset their flow series.
    Developers: **Ali Reza Shahvaran**, Elham Soleimanian, Rezgar Arabzadeh, Bryan Tolson, James Craig
    URL: https://arshahvaran.github.io/hydrograph_metrics_explorer
8. Text Studio 2026
    Description: A single-page text workbench that analyzes, transforms, and stylizes text, generating fancy Unicode fonts, academic notation, ASCII art, encodings, and exportable word clouds.
    Developer: **Ali Reza Shahvaran**
    URL: https://arshahvaran.github.io/text_studio
7. DEM 3D Studio 2026
    Description: An interactive studio for rendering a WGS84 elevation GeoTIFF as a true-scale 3D terrain block, with hypsometric color ramps, sun lighting and hillshade, distance and point measurement, and export to PNG, JPG, SVG, PDF, and OBJ.
    Developer: **Ali Reza Shahvaran**
    URL: https://arshahvaran.github.io/dem_3d_studio
6. CartoLab 2026
    Description: An interactive studio for exploring how the spherical Earth is projected onto a flat map, supporting projection morphing, distortion visualization through Tissot indicatrices, and great-circle distance measurement.
    Developer: **Ali Reza Shahvaran**
    URL: https://arshahvaran.github.io/cartolab
5. Color Model Studio 2026
    Description: A color management workbench for defining and converting colors across the HSV, HSL, RGB, and CMYK models, with palette generation and exportable code in Python, MATLAB, and R.
    Developer: **Ali Reza Shahvaran**
    URL: https://arshahvaran.github.io/color_model_studio
4. Peirce Quincuncial Map Studio 2026
    Description: A cartographic tool that renders longitude and latitude inputs as a styled square Peirce quincuncial world map, exportable in PNG, JPG, SVG, and PDF formats.
    Developer: **Ali Reza Shahvaran**
    URL: https://arshahvaran.github.io/peirce_quincuncial_map_studio
3. Linear Regression Cost Explorer 2026
    Description: An educational tool that illustrates least-squares fitting of a regression line and the iterative search performed by gradient descent toward the minimum-error solution.
    Developer: **Ali Reza Shahvaran**
    URL: https://arshahvaran.github.io/linear_regression_cost_explorer
2. Ternary Diagram Simulator 2026
    Description: A plotting utility that maps three-component compositions onto a triangular ternary diagram, with display in either percentages or fractions.
    Developer: **Ali Reza Shahvaran**

URL: https://arshahvaran.github.io/ternary_diagram_simulator

1. Western Lake Ontario Chlorophyll-a Concentration Online Visualizer 2024
   Description: An interactive web map presenting satellite-derived chlorophyll-a concentrations across western Lake Ontario, hosting the 2013 to 2023 Landsat dataset from the published study at https://doi.org/10.1016/j.scitotenv.2025.178881.
   Developers: **Ali Reza Shahvaran**, Homa Kheyrollah Pour, Caren Binding, Philippe Van Cappellen and Moulik Budhiraja
   URL: https://reseclabmap.ca/lake-chlorophyll

Software Skills

Programming Languages
Python; R; MATLAB; Fortran

Hydrologic & Hydraulic Modeling
HEC-HMS; HEC-RAS; Raven; PCSWMM; SWMM; EPANET; SWAT+ (QSWAT)

Water Quality & Reactive Transport Modeling
CE-QUAL-W2; QUAL2K; WASP; HYDRUS

CAD &Drafting
AutoCAD; Civil 3D

Remote Sensing (RS), GIS & Photogrammetry
ArcGIS Pro (Arc Hydro); QGIS, ENVI; ESA SNAP; NASA SeaDAS; Pix4Dmapper; eMotion

System Dynamics & Simulation
Vensim; AnyLogic

Other
Microsoft Office 365 suite (Excel, Word, PowerPoint); Orange; Weka; Origin Pro

Field & Laboratory Skills

Measurement & Extraction
Bathymetry & Depth Profiling; Flow Velocity & Discharge Profiling; Contactless Water Level & Surface Velocity Tracking; Groundwater Level & Drawdown Measurement; High-Precision Aerial Topographic Surveying; Depth-Targeted Water Sampling; Sediment Surveying, Coring & Extrusion; Water Quality Monitoring Including: TSS, Chloride, Turbidity, N (Nitrate), P (Phosphate & TP), Chl-a (Total & Pheophytin-corrected)

Field Instruments
Multiparameter Water Quality Sondes & Meters including: YSI ProQuatro, YSI ProDSS, YSI EXO1&2; Discrete-Depth Water Samplers including: Van Dorn Sampler; Water Level Meters including: Heron Water Tape; RTK GNSS Survey Equipment including: SingularXYZ E1, Emlid Reach RS4; Unmanned Aerial Vehicles (UAVs) including: DJI Matrice 400, eBee X Fixed-Wing; Unmanned Surface Vehicles (USVs) including: CHCNav Apache 4; Acoustic Doppler Current Profilers (ADCPs) including: CHCNav RS1200; Dual-Frequency Echo Sounders including: EchoLogger ECT D052S & ECT D24S; Radar Hydrology Sensors including: Geolux LX-80-AB Water Level & Geolux RSS-2-AB Surface Velocity

Laboratory Instruments
Spectrophotometry including: Evolution™ 260 Bio UV-Visible Spectrophotometer, HACH® DR2700™; HACH® DR1900™ Portable; Fluorometry including: TurnerDesigns 10AU Fluorometer

Licensures

Intermediate First Aid – CPR Level C (Blended), St. John Ambulance Canada (2026)
Pilot Certificate – Advanced Operations, Transport Canada (2026)
G Driver's License, Ministry of Transportation of Ontario (2024)
Pleasure Craft Operator Card, Transport Canada (2023)

Selected Certifications

Hydrologic & Hydraulic Modeling
Principles of Hydrologic Modelling, Canadian Society for Hydrological Sciences (2026)

Hydrological modelling for CRIDA using SWAT+, Vrije Universiteit Brussel (2026)
Hydraulic Modeling with HEC-RAS, US Army Corps of Engineers (2025)
Hydrologic Modeling with HEC-HMS, US Army Corps of Engineers (2024)
PCSWMM and EPA SWMM5 Modeling, CHI (2024)

Remote Sensing (RS), GIS & Photogrammetry

GIS, Mapping, and Spatial Analysis Specialization, University of Toronto (2023)
Remote Sensing Image Acquisition, Analysis and Applications, IEEE GRSS (2023)
RPAS Remote Sensing in a Northern Context, Canadian Remote Sensing Society (2023)

Data Science & Artificial Intelligence

Data Science Professional Certificate, IBM (2020)

Climate Change Impact Assessment & Adaptation

Climate Change and Water Security in Urbanized Watersheds: An Interdisciplinary Perspective, University of Waterloo (2022)
Global Warming II: Create Your Own Models in Python, University of Chicago (2021)
Global Warming I: The Science and Modeling of Climate Change, University of Chicago (2021)

Environmental Management

Sustainable Agricultural Land Management, University of Florida (2020)
Circular Economy – Sustainable Materials Management, Lund University (2020)
Global Environmental Management, Technical University of Denmark (2020)
Environmental Management & Ethics, Technical University of Denmark (2020)
Introduction to Sustainability, University of Illinois at Urbana-Champaign (2020)
Game Theory II: Advanced Applications, Stanford University (2020)
Game Theory, Stanford University (2020)
Sustainability of Social-Ecological Systems: The Nexus Between Water, Energy, and Food, Autonomous University of Barcelona (2019)

Other

Fundamentals of University Teaching, University of Waterloo (2022)

Languages

English (Fluent); French (Basic); Persian/Farsi (Native)

Professional Affiliations

Member, Ontario Society of Professional Engineers (OSPE)	May 2026–Present
Member, Canadian Society for Civil Engineering (CSCE)	Apr 2026–Present
Member, International Water Association (IWA)	Apr 2026–Present
Member, American Society of Civil Engineers (ASCE)	Apr 2026–Present
Member, Canadian Dam Association (CDA)	Apr 2026–Present
Member, Canadian Water Resources Association (CWRA)	May 2023–Present
Member, Young Earth System Scientists (YESS)	Oct 2022–Present
Member, American Geophysical Union (AGU)	Aug 2022– Aug 2023

Peer-Review Services

Expert Reviewer

Seventh Assessment Report (AR7), Working Group II — Oct 2026–Present
Intergovernmental Panel on Climate Change (IPCC), Geneva, Switzerland
Duties: Review the First Order Draft for the accuracy, completeness and balance of its scientific, technical and socio-economic content.

Journal Reviewer

Total reviews: 101 for 39 journals (as of *November 10, 2026*, based on ORCID)

Advances in Space Research, Elsevier	Oct 2026–Present
Journal of Hazardous Materials, Elsevier	Oct 2026–Present
Communications Sustainability, Springer Nature	Oct 2026–Present
Scientific Data, Springer Nature	Sep 2026–Present
Journal of Hazardous Materials Advances, Elsevier	Aug 2026–Present

Communications Earth & Environment, Springer Nature	Jul 2026–Present
Earth Systems and Environment, Springer Nature	Jul 2026–Present
Neurocomputing, Elsevier	Jul 2026–Present
Heliyon, Cell Press (Elsevier)	May 2026–Present
GIScience & Remote Sensing, Taylor & Francis	Apr 2026–Present
Weather and Climate Extremes, Elsevier	Apr 2026–Present
Journal of Great Lakes Research, Elsevier	Mar 2026–Present
Environmental Management, Springer Nature	Mar 2026–Present
Ecological Informatics, Elsevier	Mar 2026–Present
IEEE Transactions on Geoscience and Remote Sensing, IEEE	Mar 2026–Present
Marine Pollution Bulletin, Elsevier	Mar 2026–Present
Earth's Future, AGU/Wiley	Mar 2026–Present
Remote Sensing in Earth Systems Sciences, Springer Nature	Feb 2026–Present
Discover Applied Sciences, Springer Nature	Feb 2026–Present
Engineering Applications of Artificial Intelligence, Elsevier	Nov 2025–Present
Agricultural Water Management, Elsevier	Sep 2025–Present
Stochastic Environmental Research and Risk Assessment, Springer Nature	Jul 2025–Present
Environmental Modelling & Software, Elsevier	Jul 2025–Present
Remote Sensing Applications: Society and Environment, Elsevier	Jul 2025–Present
Ecological Indicators, Elsevier	Jul 2025–Present
Natural Hazards, Springer Nature	Jul 2025–Present
Environmental Monitoring and Assessment, Springer Nature	Jul 2025–Present
Journal of Hydrology, Elsevier	Jul 2025–Present
Journal of Environmental Management, Elsevier	May 2025–Present
Scientific Reports, Springer Nature	Feb 2025–Present
International Journal of Digital Earth, Taylor & Francis	Aug 2024–Present

Volunteer Experience

Science Outreach Volunteer

Science Open House, University of Waterloo, Waterloo, Ontario, Canada [Access Link] Oct 2023

Led hands-on microplastics activities for school-aged children at the University's annual free public science event (several thousand attendees each year).

Graduate-Level Coursework

University of Toronto

Principles of Hydrologic Modelling (CIVE 781); Water Resources Engineering (CIV550H1F); Intro to Data Science for Civil and Mineral Engineers (CME538H1F)

University of Waterloo

Integrated Water Management (WATER 601); Integrated Water Management Project (WATER 602); Ecohydrology (EARTH 322); Reactive Transport Modeling (EARTH 652); Eutrophication: From Process to Water Quality Management (GEOG 656)

Iran University of Science and Technology

Hydroinformatics (2112525); Risk Analysis, Uncertainties, and Reliability (2112557); Foundations of Advection and Diffusion and Pollution Modeling (2112593); Water Quality Control (2112133); RS and GIS Application in Civil Engineering and Lab. (2112483); Sustainable Developments and Environmental Engineering Management (2112513); Basics of Water and Wastewater Treatment (2112511); Basics of Solid Waste Engineering and Management (2112517)

Supervisees

Undergraduate Students

Annika Lam, BSc, University of Toronto May 2026–Aug 2026

First-Year Summer Research Fellowship Program, Co-Supervised with Prof. Mohammed Basheer

Junfei Chen, BSc, University of Toronto May 2026–Aug 2026

First-Year Summer Research Fellowship Program, Co-Supervised with Prof. Mohammed Basheer