Soroush Mahjoubi

Laboratory Manager ◇ **Smart Infrastructure Lab**

Department of Civil, Environmental and Ocean Engineering ◇ **Stevens Institute of Technology**

Phone: (201) 897-1405 ◇ Address: 601 Frank Sinatra Dr, Griffith Building, Hoboken, NJ 07030

E-mail: smahjoub@stevens.edu ◇ Website ◇ Google Scholar

EDUCATION

Ph.D. in Civil Engineering, Stevens Institute of Technology — Aug 2019 - May 2023

Thesis: Development and Applications of Machine Learning for Designing and Health Monitoring of Civil Structures and Materials

Advisor: **Dr. Yi Bao**

M.Sc. in Structural Engineering, Iran University of Science and Technology — Aug 2014 - Mar 2017

Thesis: Design Optimization of Steel Plate Shear Walls

Advisor: **Prof. A. Kaveh**

B.Sc. in Structural Engineering, Kharazmi University — Aug 2010 - July 2014

EXPERIENCE

Postdoctoral Associate — Oct 2023 - Present

Olivetti Group & Concrete Sustainability Hub - Massachusetts Institute of Technology (MIT) — *Cambridge, MA*

Adjunct Professor — Aug 2023 - Dec 2023

Department of Civil, Environmental and Ocean Engineering - Stevens Institute of Technology — *Hoboken, NJ*

Sole instructor of the course CE518: Advanced Mechanics of Materials

Laboratory Manager — Jan 2022 - May 2023

Smart Infrastructure Lab - Stevens Institute of Technology — *Hoboken, NJ*

I was responsible for the research and education activities focusing on the understanding, development, and applications of AI-assisted smart infrastructure systems that integrate advanced sensing technologies, materials, and structures to improve the resilience, sustainability, intelligence, and functionality of civil infrastructure.

- ◇ Manage laboratory operations, including equipment and facilities maintenance, budget management, and overseeing research projects and student assistants.
- ◇ Develop and lead research projects in the field of smart infrastructure, focusing on the integration of advanced sensing technologies, materials, and structures.
- ◇ Mentor and supervise graduate and undergraduate students in research projects.
- ◇ Represent the lab and present research findings at conferences and meetings.

Graduate Research Assistant — Aug 2019 - May 2023

Stevens Institute of Technology — *Hoboken, NJ*

My research has primarily focused on the application of machine learning and optimization techniques in the field of civil and materials engineering, specifically in the areas of structural design, concrete design, discovery of chemical reactions, material behavior, and sensor data analysis.

- ◇ Successfully authored and co-authored 15+ research publications in prestigious journals.
- ◇ Assist in the design, execution, and analysis of experiments and research studies.
- ◇ Collaborate with other students to do experiments, analyze data, and prepare presentations and publications.
- ◇ Contribute to the submission of research proposals and grants.
- ◇ Present research findings at conferences and workshops.

Graduate Teaching Assistant Jan 2020 - May 2022
Stevens Institute of Technology *Hoboken, NJ*
Civil Engineering Design VI, Mechanics of Solids

- ◇ Help instructors to create and update course materials for undergraduate and graduate students.
- ◇ Provide individualized support to students through office hours and one-on-one tutoring.
- ◇ Design and grade assignments and exams.

Civil and Structural Designer Jan 2016 - Jan 2017
Sangachin Construction Company *Tehran, Iran*

- ◇ Design industrial equipment support structures and foundations.
- ◇ Prepare fabrication drawings for structural works.
- ◇ Clarify technical documents for construction crews.
- ◇ Coordinate with other disciplines for area layout design.

Civil Engineer Jan 2014 - Aug 2019
Farand Sazeh Gharn Company *Tehran, Iran*

- ◇ Monitor project progress and analyze operational data.
- ◇ Offer expert guidance and employ innovative solutions to address any arising issues in the construction process.

HONORS & AWARDS

Paul Kaplan Award 2023
Stevens Institute of Technology

The university-wide award recognizes a single outstanding graduate student each year for their academic achievements, research excellence, and potential for future success beyond their program.

Outstanding Graduate Student Leader 2023
Stevens Institute of Technology

The award is given to one graduate student for outstanding student leadership in student organizations or in volunteer activities and has excelled in student life.

Ph.D. Peer Mentor Award 2023
Stevens Institute of Technology

The award is given to one Ph.D. student for outstanding student leadership and mentorship as part of the Ph.D. Peer Mentor Program.

NSF Travel Grant 2022
National Science Foundation

Received a NSF conference funding award for my participation in the NSF-sponsored workshop on grant proposal writing.

Travel Grant 2022
Stevens Institute of Technology

The award enables graduate students at Stevens Institute of Technology to present their recent research at key conferences.

Richard I. Hires Research Award 2022
Stevens Institute of Technology

The award is given annually to only one graduate student in the fields of civil, environmental, ocean, naval engineering, and construction management for exceptional research achievements.

Stevens Excellence Doctoral Fellowship 2022
Stevens Institute of Technology

The fellowship is given for exceptional achievements in Ph.D. research and dissertation writing.

REFEREED JOURNAL PUBLICATIONS

1. Du, J., **Mahjoubi, S.**, Bao, Y., Banthia, N. & Meng, W. (2023). Modeling mixing kinetics for large-scale production of ultra-high-performance concrete: Effects of temperature, volume, and mixing method. *Construction and Building Materials* **(IF=7.4)**, accepted for publication.

2. Tan, X., **Mahjoubi, S.**, Zou, X., Meng, W. & Bao, Y. (2023). Metaheuristic inverse analysis on interfacial mechanics of distributed fiber optic sensors undergoing interfacial debonding. *Mechanical Systems and Signal Processing* **(IF=8.934)**, 200, 110532. https://doi.org/10.1016/j.ymssp.2023.110532.

3. **Mahjoubi, S.**, Barhemat, R., Meng, W. & Bao, Y. (2023). Deep learning from physicochemical information of concrete with an artificial language for property prediction and reaction discovery. *Resources, Conservation and Recycling* **(IF=13.716)**, 190, 106870. https://doi.org/10.1016/j.resconrec.2023.106870.

4. **Mahjoubi, S.**, Ye, F., Bao, Y., Meng, W. & Zhang, X.(2023). Identification and classification of exfoliated graphene flakes from microscopy images using a hierarchical deep convolutional neural network. *Engineering Applications of Artificial Intelligence* **(IF=7.802)**, 119, 105743. https://doi.org/10.1016/j.engappai.2022.105743.

5. **Mahjoubi, S.**, Barhemat, R., Meng, W. & Bao, Y. (2023). AI-guided auto-discovery of low-carbon cost-effective ultra-high performance concrete (UHPC). *Resources, Conservation and Recycling* **(IF=13.716)**, 189, 106741. https://doi.org/10.1016/j.resconrec.2022.106741.

6. Tan, X., **Mahjoubi, S.**, Zhang, Q., Dong, D. & Bao, Y. (2022). A framework for improving bridge resilience and sustainability through optimizing high-performance fiber-reinforced cementitious composites. *Journal of Infrastructure Preservation and Resilience* **(IF=2.1)**, 3(1), 1-18. https://doi.org/10.1186/s43065-022-00067-0.

7. Barhemat, R., **Mahjoubi, S.**, Li, V., & Bao, Y (2022). Lego-inspired reconfigurable modular blocks for automated construction of engineering structures. *Automation in Construction* **(IF=10.517)**, 139, 104323. https://doi.org/10.1016/j.autcon.2022.104323.

8. Yan, M., Tan, X., **Mahjoubi, S.**, & Bao, Y. (2022). Strain transfer effect on measurements with distributed fiber optic sensors. *Automation in Construction* **(IF=10.517)**, 139, 104262. https://doi.org/10.1016/j.autcon.2022.104262.

9. **Mahjoubi, S.** & Bao, Y. (2022). Logic-guided neural network for predicting steel-concrete interfacial behaviors. *Expert Systems with Applications* **(IF=8.665)**, 198, 116820. https://doi.org/10.1016/j.eswa.2022.116820.

10. **Mahjoubi, S.**, Tan, X. & Bao, Y. (2022). Inverse analysis of strain distributions sensed by distributed fiber optic sensors subject to strain transfer. *Mechanical Systems and Signal Processing* **(IF=8.934)**, 166, 108474. https://doi.org/10.1016/j.ymssp.2021.108474.

11. **Mahjoubi, S.**, Barhemat, R., Guo, P., Meng, W. & Bao, Y. (2021). Prediction and multi-objective optimization of mechanical, economical, and environmental properties for strain-hardening cementitious composites (SHCC) based on automated machine learning and metaheuristic algorithms. *Journal of Cleaner Production* **(IF=11.072)**, 329, 129665. https://doi.org/10.1016/j.jclepro.2021.129665.

12. **Mahjoubi, S.**, Meng, W. & Bao, Y. (2022). Auto-tune learning framework for prediction of flowability, mechanical properties, and porosity of ultra-high-performance concrete. *Applied Soft Computing* **(IF=8.263)**, 115, 108182. https://doi.org/10.1016/j.asoc.2021.108182.

13. **Mahjoubi, S.** & Bao, Y. (2021). Game theory-based metaheuristics for structural design optimization. *Computer-Aided Civil and Infrastructure Engineering* **(IF=10.066)**, 36(10), 1337-1353. https://doi.org/10.1111/mice.12661.

14. **Mahjoubi, S.**, Barhemat, R. & Bao, Y. (2020). Optimal placement of triaxial accelerometers using hypotrochoid spiral optimization algorithm for automated monitoring of high-rise buildings. *Automation in Construction* **(IF=10.517)**, 118, 103273. https://doi.org/10.1016/j.autcon.2020.103273.

15. Dar, M.A., Subramanian, N., Dar, D.A., Dar, A.R., Anbarasu, M., Lim, J.B. & **Mahjoubi, S.** (2020). Flexural strength of cold-formed steel built-up composite beams with rectangular compression flanges. *Steel and Composite Structures* **(IF=6.386)**, 34(2), 171-188. https://doi.org/10.12989/scs.2020.34.2.171.

16. Kaveh, A. & **Mahjoubi, S.** (2019). Hypotrochoid spiral optimization approach for sizing and layout optimization of truss structures with multiple frequency constraints. *Engineering with Computers* **(IF=8.083)**, 35(4), 1443-1462. https://doi.org/10.1007/s00366-018-0675-6.

17. Kaveh, A. & **Mahjoubi, S.** (2018). Lion pride optimization algorithm: A meta-heuristic method for global optimization problems. *Scientia Iranica* **(IF=1.416)**, 25(6), 3113-3132. https://doi.org/10.24200/SCI.2018.20833.

18. Kaveh, A., Ilchi Ghazaan, M. & **Mahjoubi, S.** (2018). Comparison of four meta-heuristic algorithms for optimal design of double-layer barrel vaults. *International Journal of Space Structures* **(IF=1.474)**, 33(3-4), 115-123. https://doi.org/10.1177/0266351118803019.

19. Kaveh, A. & **Mahjoubi, S.** (2018). Optimum design of double-layer barrel vaults by lion pride optimization algorithm and a comparative study. *Structures* **(IF=5.871)**, 13, 213-229. https://doi.org/10.1016/j.istruc.2018.01.002.

20. Kaveh, A. & **Mahjoubi, S.** (2017). Design of multi-span steel box girder using lion pride optimization algorithm. *Smart Structures and Systems* **(IF=4.581)**, 20(5), 607-618. https://doi.org/10.12989/sss.2017.20.5.607.

PRESENTATIONS

1. Design of Lego-inspired reconfigurable modular blocks for automated construction of engineering structures, **24st Annual Research Showcase, New Jersey Department of Transportation (NJDOT) Bureau of Research**, *West Windsor, NJ*, 2022.

2. Multi-objective optimization of mechanical, economical, and environmental properties for strain-hardening cementitious composites (SHCC) based on automated machine learning and metaheuristic algorithms, **Engineering Mechanics Institute Conference (EMI)**, *Baltimore, MD*, 2022.

3. Inverse analysis of strain distribution sensed by distributed fiber optic sensor subject to strain transfer, **Engineering Mechanics Institute Conference (EMI)**, *Baltimore, MD*, 2022.

4. A Machine Learning Based Framework for Predicting Flowability, Mechanical Properties, and Porosity of Ultra High-Performance Concrete, **American Concrete Institute (ACI) Fall Convention**, *Online*, 2021.

5. Artificial Intelligence (AI) applications for design and inspection of bridges, **21st Annual Research Showcase, New Jersey Department of Transportation (NJDOT) Bureau of Research**, *West Windsor, NJ*, 2020.

PROPOSAL WRITING EXPERIENCE & TRAINING

Workshop on Grant Proposal Writing 2022
National Science Foundation *Johns Hopkins University*

- ◇ Participated in a National Science Foundation overview session led by Prof. Gianluca Cusatis, including information on NSF programs, ECI Program, solicitations, and the NSF merit review process.
- ◇ Participated in a session about creating a vision for a research proposal led by NSF Program Directors.
- ◇ Participated in a panel discussion on best practices in NSF grant proposal writing, led by recent CAREER awardees and other recently funded researchers.

Proposal Writing Assistant 2019-2022
Assisted my advisor in writing several proposals for funding from various organizations to secure research funding.

- ◇ Resilience of civil infrastructure against natural disasters, *National Science Foundation*, pending, 2022.
- ◇ Incorporation of industrial waste materials in high-performance concrete, *Department of Defense*, **funded**, 2021.
- ◇ Distributed fiber optic sensor network for real-time monitoring of pipeline interactive anomalies, *US Department of Transportation*, **funded**, 2019.

SERVICE

Guest Editor Feb 2023 - Present

Frontiers in Materials, Special Issue: Artificial Intelligence Approaches in Assessing Sustainable Materials: From Design to Application

Peer Reviewer Nov 2021 - Present

Scientific Reports, Journal of Shock and Vibration, Frontiers in Materials

Graduate Student Representative Aug 2022 - May 2023

Stevens Institute of Technology - Graduate Curriculum Committee (GCC) *Hoboken, NJ*

I was appointed to the committee by the Graduate Academics & Student Success to represent all graduate students at Stevens Institute of Technology. The committee is responsible for proposing, discussing, and voting on all curriculum updates such as new courses, new graduate programs, changes to curriculum.

- ◇ Collaborate with faculty representatives from each graduate program, and **Senior Vice Provost of Graduate Education (Dr. Constantin Chassapis)** to make important decisions for the graduate curriculum.
- ◇ Participate in meetings, discussions and voting on curriculum changes to ensure that the needs of graduate students are met.
- ◇ Keep informed of the latest developments in the field, and providing feedback on the current curriculum.

Graduate Peer Mentor Aug 2021 - May 2023

Stevens Institute of Technology - Graduate Academics & Student Success *Hoboken, NJ*

The Graduate Peer Mentor Program is designed to connect incoming graduate students with current graduate students to facilitate their transition to the graduate program at Stevens Institute of Technology.

- ◇ Mentored 50+ graduate students at the PhD level.
- ◇ Assist graduate students with academic resources, research opportunities, and networking with peers and faculty.
- ◇ Act as a liaison between graduate students and the university administration.
- ◇ Provide guidance and support to students as they navigate academic and non-academic challenges.

Event Organizer and Panelist Aug 2022 - May 2023 (Expected)

Stevens Institute of Technology - Graduate Academics & Student Success *Hoboken, NJ*

- ◇ Participated as a panelist in events such as *"What I Wish I had Known: Reflection on the Doctoral Student Experience"* and *"American Classroom Culture"* to share my experiences and insights with graduate students and provide guidance.
- ◇ Help to organize and facilitate workshops and events aimed at providing support for graduate students.

President Aug 2022 - May 2023

Iranian Association at Stevens *Hoboken, NJ*

The Iranian Association at Stevens is a student organization that aims to promote and introduce Persian culture to students at Stevens Institute of Technology, as well as support the Persian community at the school. The organization holds meetings, events, and social gatherings to involve members, and also holds seminars to connect alumni and current students.

- ◇ Promote Iranian culture through organizing events and activities
- ◇ Coordinate and communicate with members, other student organizations, and university officials to enhance cultural awareness.
- ◇ Ensure that the organization's mission and goals are effectively communicated and upheld, and create a welcoming and inclusive environment for all members.
- ◇ Facilitate communication between members to create a sense of community.

REFERENCES

Dr. Yi Bao
Ph.D. advisor
Assistant Professor, Department of Civil, Environmental and Ocean Engineering
Stevens Institute of Technology
E-mail: yi.bao@stevens.edu

Prof. Muhammad Hajj
Chair, Department of Civil, Environmental and Ocean Engineering
Director of Davidson Laboratory, and George Meade Bond Professor
Stevens Institute of Technology
E-mail: mhajj@stevens.edu

Prof. Constantin Chassapis
Senior Vice Provost for Graduate Education
Stevens Institute of Technology
E-mail: cchassap@stevens.edu