

Amit Ojha

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Department of Civil, Environmental & Architectural Engineering
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RESEARCH INTERESTS

Human-Centered Autonomy in Construction; Affordable and Field-Deployable Construction Robotics; Human Factors and Ergonomics; Robotic Perception and Control; Behavior-Informed Robotic Assistance; Wearable Physiological Sensing; Psychophysiological Risk Modeling; Immersive Technology for Human-Robot Collaboration and Safety Training; Innovation in STEM and Engineering Education

EDUCATION

2022 – 2026 **Doctor of Philosophy** in Civil Engineering

University of Illinois Urbana-Champaign, Champaign, IL, U.S.

- Major: Construction Engineering and Management
- Dissertation: “Understanding Underlying Risks and Sociotechnical Challenges of Powered Wearable Exoskeleton to Construction Workers” (Advisor: Prof. Houtan Jebelli)
- Selected Courses: Graduate-level courses in Civil Engineering, Electrical Engineering and Computer Science, as well as Statistics, including Construction Robotics; Construction Safety; Construction Optimization; Database Management; Advanced Data Analysis; Data Science

2020 – 2022 **Master of Science** in Construction Engineering

The Pennsylvania State University, State College, PA, U.S.

- Major: Architectural Engineering (Construction Engineering option).
- Thesis: “Heat Strain Risk Assessment of Field Workers: Integrating Wearable Sensing and Artificial Intelligence” ([Link](#)) (Advisor: Prof. Houtan Jebelli)
- Selected Courses: Graduate-level courses in Construction Engineering, Computer Science, and Statistics, including Machine Learning for Engineers; Building Construction Engineering I; Building Construction Engineering II; Pattern Recognition and Machine Learning; Data Mining; Introduction to Humanoid Robots, Applied Statistics; Robotic Concepts

2013 – 2018 **Bachelor of Science** in Architectural Engineering

Institute of Engineering (Pulchowk Campus), Lalitpur, Nepal

- Core Courses: Construction Management; Building Materials; Applied Mechanics; Engineering Mathematics, Structures; Building Construction; Building Services; Building Science (GPA: 4/4)

ACADEMIC APPOINTMENTS

2026 – Present **Assistant Professor**, Civil Engineering

University of Kansas, Lawrence, KS, U.S.

2022 – 2026 **Graduate Research Assistant**, under the supervision of Prof. Houtan Jebelli

University of Illinois Urbana-Champaign, Champaign, IL, U.S.

2020 – 2022 **Graduate Research Assistant**, under the supervision of Prof. Houtan Jebelli

The Pennsylvania State University, State College, PA, U.S.

PUBLICATIONS

‡: Mentored Undergraduate Student, ‡‡: Mentored Graduate Student

BOOK CHAPTERS

1. **Ojha, A.**, Jebelli, H., and Akanmu, A. (2025). “Hybrid Adaptive Motion Control Algorithm for Powered Exoskeletons Use in Construction,” *Global Frontiers of Robotics in Construction, Civil*

Infrastructure, and the Built Environment. American Society of Civil Engineers, Reston, VA. (under review)

2. **Ojha, A.**, Jebelli, H., and Martin, A. 2025. "Chapter 9- Real-Time Fatigue Risk Assessment in Exoskeleton-Assisted Construction Tasks Using Breath-by-Breath Respiratory Data," *AI, Robotics, and Automation in Construction – Emerging Technologies for Sustainability, Efficiency, and Safety*, Edited by Jebelli, H., Liu, Y., Du, J., Cho, Yong K., and Bock, T., Springer. (under review)
3. **Ojha, A.**, Ren, T. [✉], Zhao, X. [✉], Gautam, Y. [✉], Zhang, Y. [✉], and Jebelli, H., 2025. "Chapter 8- Automation and Robotics in Construction Sector: Technologies, Applications, and Impacts," *Handbook of Workplace Safety and Health*, Edited by Goh, Yiang. M., Springer. (under review)
4. Gautam, Y. [✉], Adhikari, R. [✉], **Ojha, A.**, Jebelli, H., and Sitzabee, W.E. 2024. "Predictive Maintenance of Building Facility: A Digital Twin Framework Using Long Short-Term Memory Encode–Decode Model." *Digital Twins in Construction and the Built Environment*. American Society of Civil Engineers, Reston, VA, pp. 173–188. <https://doi.org/10.1061/9780784485606.CH8>
5. Shayesteh, S., **Ojha, A.**, Jebelli, H., Ray, A., 2024. Digital Twin–Enabled Health Monitoring of Construction Workers during Robotic Teleoperation, in: *Digital Twins in Construction and the Built Environment*. American Society of Civil Engineers, Reston, VA, pp. 63–76. <https://doi.org/10.1061/9780784485606.CH3>
6. Shayesteh, S., **Ojha A.**, and Jebelli, H. (2021) "Chapter 10 - Workers' Trust in Collaborative Construction Robots: EEG-Based Trust Recognition in an Immersive Environment," *Automation and Robotics in the Architecture, Engineering, and Construction Industry*, Edited by Jebelli, H., Habibnezhad, M., Shayesteh, S., Asadi, S., and Lee, S., Springer. (https://doi.org/10.1007/978-3-030-77163-8_10)

JOURNAL PAPERS

7. **Ojha, A.**, Liu, Y., Liu, Y., and Jebelli, H. (2025). "Advanced Path Planning for Safe Human-Robot Collaboration in Construction: A Pose-Aware Approach." *Canadian Journal of Civil Engineering*, <https://doi.org/10.1139/cjce-2025-0094>
8. **Ojha, A.**, Shayesteh, S., Liu, Y., Jebelli, H., and Akanmu, A. (2025). "Psychophysiological Impacts of Working with Powered Exoskeletons on Construction Sites." *Automation in Construction*, 177, 106312., <https://doi.org/10.1016/j.autcon.2025.106312>. [IF: 11.5]
9. **Ojha, A.**, Gautam, Y. [✉], Jebelli, H., and Akanmu, A. (2024). "Physiological impact of powered back-support exoskeletons in construction: Analyzing muscle fatigue, metabolic cost, ergonomic risks, and stability." *Automation in Construction*, 168, 105742., <https://doi.org/10.1016/j.autcon.2024.105742> [IF: 11.5]
10. **Ojha, A.**, Shayesteh, S., Sharifironizi, A. [✉], Liu, Y., and Jebelli, H. (2024) "Worker-centric heat strain analysis: Integrating physiological signals with ensemble learning and domain adaptation." *Automation in Construction*, 166, 105670., <https://doi.org/10.1016/j.autcon.2024.105670> [IF: 11.5]
11. Shayesteh, S., **Ojha A.**, Liu, Y., and Jebelli, H. (2022) " Human-robot teaming in construction: Evaluative safety training through the integration of immersive technologies and wearable physiological sensing," *Safety Science*, Elsevier, 159, (<https://doi.org/10.1016/j.ssci.2022.106019>) [IF: 5.4]
12. **Ojha, A.**, Liu, Y., Shayesteh, S., Jebelli, H., and Sitzabee, W. (2022). "Affordable Multi-Agent Robotic System for Same-level Fall Hazard Detection in Indoor Construction Environment," *Journal of Computing in Civil Engineering*, ASCE ([https://doi.org/10.1061/\(ASCE\)CP.1943-5487.0001052](https://doi.org/10.1061/(ASCE)CP.1943-5487.0001052)) [IF: 5.2]

13. Liu, Y., **Ojha A.**, Shayesteh, S., Jebelli, H., and Lee, S. (2022) "Generative Adversarial Networks (GAN) based Physiological Computing System for Robotic Perception during Human-Robot Interaction in Construction," *Canadian Journal of Civil Engineering*, (<https://doi.org/10.1139/cjce-2021-0646>)
14. Shakerian, S., Habibnezhad, M., **Ojha, A.**, Lee, G., Liu, Y., Jebelli, H., and Lee, S. H. (2021). "Assessing occupational risk of heat stress at construction: A worker-centric wearable sensor-based approach." *Safety Science*, Elsevier, 142, (<https://doi.org/10.1016/J.SSCI.2021.105395>) [IF: 5.4]

CONFERENCE PROCEEDINGS

15. **Ojha, A.**, Zhao, X. [✉], Gautam, Y. [✉], Shayesteh, S., Jebelli, H., and Abiola, A. (2025). "Immersive Robotics Learning in Construction Education: Identifying the Role of Demographics and Spatial Reasoning. In *Construction Research Congress 2026*. (under review)
16. **Ojha, A.**, Zhang, Y. [✉], Jebelli, H., and Abiola, A. (2025). "Examining The Role of Virtual Reality in Construction Robotics Learning: Insights on Realism, Presence, and Simulation Sickness," 2025 International Conference on Computing in Civil Engineering (i3CE), New Orleans, LA, U.S. (in press)
17. **Ojha, A.**, Gautam, Y. [✉], Jebelli, H., and Abiola, A. (2025). "Assessing the Impact of Exoskeleton Systems on Worker Trust During Repetitive Construction Tasks: A Trust Detection Framework Integrating Physiological Signals and Artificial Intelligence," 2025 International Conference on Computing in Civil Engineering (i3CE), New Orleans, LA, U.S.
18. Zhang, Y., **Ojha, A.**, Shayesteh, S., and Jebelli, H. (2025). " Investigating the Role of Haptic Feedback in Enhancing Immersive Exoskeleton Training in Construction," 2025 International Conference on Computing in Civil Engineering (i3CE), New Orleans, LA, U.S. (in press)
19. **Ojha, A.**, and Jebelli, H. (2025). "Understanding the Impact of an Active Exoskeleton System on Vigilance Level of Workers During Common Repetitive Construction Tasks," 42nd International Symposium on Automation and Robotics in Construction (ISARC 2025), Montreal, Canada. <https://doi.org/10.22260/ISARC2025/0113>
20. **Ojha, A.**, and Jebelli, H. (2025). "Transforming Construction Robotics Education with Virtual Reality: Analyzing Student Presence and Self-Efficacy," 42nd International Symposium on Automation and Robotics in Construction (ISARC 2025), Montreal, Canada. <https://doi.org/10.22260/ISARC2025/0107>
21. Zhang, Y., **Ojha, A.**, Shayesteh, S., & Jebelli, H. (2025). "Personalized and Adaptive Virtual Reality Training for Physically Coupled Robots in Construction," 42nd International Symposium on Automation and Robotics in Construction (ISARC 2025), Montreal, Canada. <https://doi.org/10.22260/ISARC2025/0114>
22. Gautam, Y., Zhang, Y., **Ojha, A.**, & Jebelli, H. (2025). "Vision Transformer-based Local Physical Fatigue Assessment using Electromyography (EMG) Signals for Construction Worker Health Monitoring," 42nd International Symposium on Automation and Robotics in Construction (ISARC 2025), Montreal, Canada. <https://doi.org/10.22260/ISARC2025/0162>
23. Shayesteh, S., **Ojha, A.**, Gautam, Y., Jebelli, H. & Akanmu, A. (2024). " Evaluating the Impact of Back-Support Exoskeletons on Construction Workers' Fall Risk," In *Computing in Civil Engineering 2024* (pp. 608-616). <https://doi.org/10.1061/9780784486139.066>
24. Gautam, Y. [✉], **Ojha, A.**, Liu, Y., & Jebelli, H. (2024). "Advancing Realtime Physiological Health Monitoring in Construction: A Feasibility Study of Fatigue Estimation of Construction Workers on Smart Devices.," In *Computing in Civil Engineering 2024* (pp. 913-921). <https://doi.org/10.1061/9780784486139.098>

25. **Ojha, A.**, Zhao, X. [✉], Zhang, Y. [✉], Liu, Y., & Jebelli, H. (2024). "Improving Heat Strain Prediction in Construction Workers: A Transfer Learning Approach to Overcome Variability Challenges," In *Computing in Civil Engineering 2024* (pp. 877-886). <https://doi.org/10.1061/9780784486139.094>
26. **Ojha, A.**, Gautam, Y. [✉], Zhao, X. [✉], Sharifironizi, A. [✉], Jebelli, H., & Martin, A. (2024). Understanding the Impact of an Exoskeleton System on Metabolic Cost of Workers During Common Repetitive Construction Tasks., In *Computing in Civil Engineering 2024* (pp. 646-655).<https://doi.org/10.1061/9780784486139.070>
27. **Ojha, A.**, Shayesteh, S., Jebelli, H., Akanmu, A., Miller, S., & Sharma, P. (2024). Revitalizing Students' Perception and Knowledge of Construction Safety: Leveraging Virtual Reality as an Experiential Learning Tool for Construction Robotic Safety Education. In *Construction Research Congress 2024* (pp. 129-138). <https://doi.org/10.1061/9780784485293.014>
28. **Ojha, A.**, Jebelli, H., Alexander, L., & Loeffert, J. R. (2024). Quantifying the Implications of Humidity and Temperature on Heat Stress Exposure of Construction Workers: A Worker-Centric Physiological Sensing Approach. In *Construction Research Congress 2024* (pp. 196-205). <https://doi.org/10.1061/9780784485262.021>
29. **Ojha, A.**, Sharifironizi, A. [✉], Liu, Y., & Jebelli, H. (2024). Enhancing Human-Centric Physiological Data-Driven Heat Stress Assessment in Construction through a Transfer Learning-Based Approach. In *Construction Research Congress 2024* (pp. 157-167). <https://doi.org/10.1061/9780784485262.017>
30. Liu, Y., Gautam, Y., **Ojha, A.**, Shayesteh, S., & Jebelli, H. (2024). Studying the Effects of Back-Support Exoskeletons on Workers' Cognitive Load during Material Handling Tasks. In *Construction Research Congress 2024* (pp. 659-669). <https://doi.org/10.1061/9780784485262.06>
31. Breneman, M. [✉], **Ojha, A.**, Jebelli, H., Simkins, S. J., & Akanmu, A. (2024). Breaking Down Barriers: A Study of Challenges to Adopting Powered Exoskeletons in the US Construction Industry. In *Computing in Civil Engineering 2023* (pp. 763-770). <https://doi.org/10.1061/9780784485224.092>
32. **Ojha, A.**, Jebelli, H., Martin, A., and Akanmu, A (2023). " Assessing the Impact of Active Back Support Exoskeletons on Muscular Activity during Construction Tasks: Insights from Physiological Sensing," In *Computing in Civil Engineering 2023* (pp. 340-347). <https://doi.org/10.1061/9780784485248.041>
33. **Ojha, A.**, Liu, Y., Jebelli, H., Cheng, H., and Kiani, M (2023). " Improving Health Monitoring of Construction Workers Using Physiological Data-Driven Techniques: An Ensemble Learning-Based Framework to Address Distributional Shifts," In *Computing in Civil Engineering 2023* (pp. 631-638). <https://doi.org/10.1061/9780784485248.076>
34. Liu, Y., **Ojha, A.**, and Jebelli, H., (2023). " Vision-based Ergonomic Risk Assessment of Back-Support Exoskeleton for Construction Workers in Material Handling Task," In *Computing in Civil Engineering 2023* (pp. 331-339). <https://doi.org/10.1061/9780784485248.04>
35. Shayesteh, S., **Ojha, A.**, Liu, Y., and Jebelli, H. (2023). " Evaluating the Impact of Powered Back-Support Exoskeletons and Virtual Reality Interventions on Gait Stability of Construction Workers at Heights," In *Computing in Civil Engineering 2023* (pp. 392-399). <https://doi.org/10.1061/9780784485248.047>
36. Fardhosseini, S., **Ojha, A.**, Habibnezhad, M., Lee, H., and Jebelli, H. (2022). "An Optimal Resource Allocation Strategy for Retrofitting Unreinforced Masonry Buildings in The Pre-Disaster Stage," *Construction Research Congress 2022*, American Society of Civil Engineers, Reston, VA (<https://doi.org/10.1061/9780784483961.113>)

37. **Ojha, A.**, Habibnezhad, M., and Jebelli, H. (2022). "Feasibility Of Embodied Virtual Agents for Augmenting Students' Knowledge of Robotic Safety in Construction," *Construction Research Congress 2022*, American Society of Civil Engineers, Reston, VA (<https://doi.org/10.1061/9780784483985.008>)
38. **Ojha, A.**, Habibnezhad, M., Jebelli, H., and Leicht, R. (2022). "Barrier Analysis of Effective Implementation of Robotics in The Construction Industry," *Construction Research Congress 2022*, American Society of Civil Engineers, Reston, VA (<https://doi.org/10.1061/9780784483961.069>)
39. Shakerian, S., **Ojha, A.**, Jebelli, H., and Sitazabee, W. (2021). "Investigating the Potentials of Operational Data Collected from Facilities' Embedded Sensors for Early Detection of HVAC Systems' Failures," 2021 International Conference on Computing in Civil Engineering (i3CE 2021), American Society of Civil Engineers, Orlando, FL, U.S. (<https://ascelibrary.org/doi/abs/10.1061/9780784483893.014>)
40. **Ojha, A.**, Liu, Y., Shayesteh, S., and Jebelli, H. (2021). "Developing an Affordable Robotic System for Automated Fall Hazard Detection and Localization in Indoor Construction Environments," 2021 International Conference on Computing in Civil Engineering (i3CE 2021), American Society of Civil Engineers, Orlando, FL, U.S. (<https://ascelibrary.org/doi/abs/10.1061/9780784483893.128>)
41. **Ojha, A.**, Shakerian, S., Habibnezhad, M., and Jebelli, H. (2021). "Feasibility Verification of Multimodal Wearable Sensing System for Holistic Health Monitoring of Construction Workers," Lecture Notes in Civil Engineering: Proceedings of CSCE 2021 Conference, Springer. (https://link.springer.com/chapter/10.1007/978-981-19-0503-2_23)
42. **Ojha, A.**, Jebelli, H., and Sharifironizi, M. (2021). "Understanding Students' Engagement in Learning Emerging Technologies of Construction Sector: Feasibility of Wearable Physiological Sensing System-Based Monitoring," Lecture Notes in Civil Engineering: Proceedings of CSCE 2021 Conference, Springer. (https://link.springer.com/chapter/10.1007/978-981-19-0503-2_22)
43. **Ojha, A.**, Seagers, J. ^{‡‡}, Shayesteh, S., Habibnezhad, M., and Jebelli, H. (2020). "Construction Safety Training and their Evaluations Approaches: A Systematic Literature Review," The 8th International Conference on Construction Engineering and Project Management, Hong Kong
44. **Ojha, A.**, Shakerian, S., Habibnezhad, M., Jebelli, H., and Lee, S. (2020). "Feasibility of Using Physiological Signals from a Wearable Biosensor to Monitor Heat Stress of Construction Workers," Creative Construction Conference 2020, Opatija, Croatia (<https://doi.org/10.3311/CCC2020-004>)

POSTER PRESENTATIONS

- | | |
|------|---|
| 2025 | Ojha, A. , and Jebelli, H. "Collaborative Research NRI: Understanding Underlying Risks and Sociotechnical Challenges of Powered Wearable Exoskeleton to Construction Workers," 2025 NRI-FRR Principal Investigators' Meeting, Alexandria, VA, U.S. (accepted). |
| 2023 | Ojha, A. , and Jebelli, H. "New Paradigm for Learning Robotic Safety in Construction: Developing a VR-based hands-on training module for equipping students with pragmatic safety knowledge of working alongside common construction robots," Leonhard Center Research Symposium, The Pennsylvania State University, State College, PA, U.S. |
| 2022 | Ojha, A. , and Jebelli, H. "Human-centric Noninvasive Physiological Sensing System for Early Detection of Workers' Heat Stress in the Field," AACEI Montreal 3-Minute Competition, Concordia University, Montreal, Quebec, CA. (Winner of the Competition) |
| 2022 | Manrique, C. [‡] , Breneman, M. ^{‡‡} , Ojha, A. , and Jebelli, H. "Advantages to the Implementation of Exoskeletons in the United States," Building Engineering—Seminal Undergraduate Research Experience (BE—SURE) Poster Session 2022. |

- 2022 Sengul, A. [§], Breneman, M. ^{§§}, **Ojha, A.**, and Jebelli, H. "Limitations to the Implementation of Exoskeletons in the United States" Building Engineering—Seminal Undergraduate Research Experience (BE—SURE) Poster Session 2022.
- 2022 **Ojha, A.**, and Jebelli, H. " Multi-Agent Robotic System for Fall Hazard Monitoring in the Construction Site," Institute for Computational and Data Sciences Symposium (ICDS 2022), The Pennsylvania State University, State College, PA, U.S.
- 2022 **Ojha, A.**, and Jebelli, H. " Affordable Robotic System for Fall Hazard Detection in Construction Environment," Partnership for Achieving Construction Excellence Research Seminar 2022 (PACE Seminar 2022), The Pennsylvania State University, State College, PA, U.S.
- 2022 **Ojha, A.**, and Jebelli, H. "Worker-centric wearable sensor-based heat stress assessment of construction Workers in the Field," College of Engineering Research Symposium 2022 (CERS 2022), The Pennsylvania State University, State College, PA, U.S.
- 2021 **Ojha, A.**, and Jebelli, H. "Wearable Biosensors for Construction Workers' Holistic Health Monitoring," College of Engineering Research Symposium 2021 (CERS 2021), The Pennsylvania State University, State College, PA, U.S.

AWARDS & HONORS

- 2022 **Gordon D. Kissinger Graduate Fellowship**, The Pennsylvania State University.
- 2022 **PACE Graduate Student Travel Fellowship**, Professional and Community Engagement (PACE), The Pennsylvania State University.
- 2022 **Marlene & Joseph Borda Architectural Engineering Graduates Travel Fellowship**, Architectural Engineering Department, The Pennsylvania State University, State College, PA, U.S
- 2021 **First Place in "3-Minute Thesis Competition"**, hosted by AACEI-Montreal Section, Montreal ([Link](#))
- Research Title: "Human-centric noninvasive physiological sensing system for early detection of workers' heat stress in the field."
- 2021 **Marlene & Joseph Borda Architectural Engineering Graduates Travel Fellowship**, Architectural Engineering Department, The Pennsylvania State University, State College, PA, U.S.
- 2021 **Gordon D. Kissinger Graduate Fellowship**, The Pennsylvania State University.
- 2021 **PACE Graduate Student Travel Fellowship**, Professional and Community Engagement (PACE), The Pennsylvania State University

RESEARCH FUNDING & GRANTS

FUNDED GRANTS (As PI)

- 2022-2023 *Revitalizing Students' Perception and Knowledge of Construction Safety: Designing a Virtual Field Trip Module as an Experiential Learning Tool for Construction Education* ([Link](#)) **(Funded: \$10,000)**
- Funding Source: The Leonhard Center for Enhancement of Engineering Education
 - Role: Principal Investigator (PI)

GRANT WRITING EXPERIENCE

- 2025 *Pivots: Immersive Experiential Training for Robotic Additive Manufacturing in Construction Collaboration* ([Link](#)) **(ITE-2526098; Amount: \$1,000,000)**
- National Science Foundation Experiential Learning for Emerging and Novel Technologies (NSF-ExLENT)
 - PI: Dr. Houtan Jebelli
 - Role: Assisted lead PI in shaping research scope, defining technical milestones, and contributing to full proposal narrative and structure.

- 2025 *Collaborative Research: Endowing Aerial Robots with Ground Mobility and Multimodal Perception for Autonomous Roof Inspection* ([Link](#)) (ECCS-2525503; **Amount: \$700,000**)
- National Science Foundation Foundational Research in Robotics (NSF-FRR)
 - PI: Dr. Houtan Jebelli
 - Role: Supported PI in defining research framework, outlining algorithmic and experimental components, generating visualizations, and drafting the grant proposal.
- 2023 *Collaborative Research: IUSE: Investigating the Impact of an Immersive Virtual Reality-based Learning Environment for Learning Human-Robot Collaboration* ([Link](#)) (DUE-2402008; **Amount: \$600,000**)
- National Science Foundation Improving Undergraduate STEM Education: Directorate for STEM Education (NSF-IUSE: EDU)
 - PI: Dr. Houtan Jebelli
 - Role: Contributed PI to educational framework development, technical details, full proposal writing, and preparation of all required submission materials.
- 2022 *Collaborative Research: FW-HTF-R: Future of Construction Workplace Health Monitoring* ([Link](#)) (CMMI-2401745; **Amount: \$1,800,000**)
- National Science Foundation Future of Work at the Human-Technology Frontier (NSF-FW-HTF)
 - PI: Dr. Houtan Jebelli
 - Role: Assisted PI with framework design, proposal writing, and preparation of all supplementary documents.
- 2022 *Human-centric, Non-invasive Physiological Sensing Framework for Early Detection of Workers' Heat Stress in the Field* ([Link](#)) (R21OH012715; **Amount \$422,000**)
- National Institute for Occupational Safety and Health Exploratory/Developmental Grant Program (NIOSH R21)
 - PI: Dr. Houtan Jebelli
 - Role: Assisted PI with framework design, technical details (algorithm design and experiment design), visualization, and proposal writing.
- 2022 *Collaborative Research: NRI: Understanding Underlying Risks and Sociotechnical Challenges of Powered Wearable Exoskeleton to Construction Workers* ([Link](#)) (IIS-2401255; **Amount: \$675,000**)
- National Science Foundation National Robotics Initiative (NSF-NRI)
 - PI: Dr. Houtan Jebelli
 - Role: Assisted PI with framework design, technical details, full proposal writing, and preparation of all supplementary documents. This grant anchors my doctoral dissertation.
- 2021 *Heat Strain Risk Assessment of Field Workers: Integrating Wearable Physiological Sensing and Artificial Intelligence* (**Funded: \$80,000**)
- Mary Imogene Bassett Hospital
 - PI: Dr. Houtan Jebelli
 - Role: Assisted PI with framework design, technical details, full proposal writing, and preparation of all supplementary documents. This grant anchors my master's thesis.

TEACHING EXPERIENCE

TEACHING EXPERIENCE AT UIUC

- Fall 2025 **Co-Instructor, CEE 498 – Construction Safety** (48 students)
- Course Details: CEE 498 introduces students to core principles of construction safety, OSHA regulations, hazard identification, accident causation theories, and safety management. The course also covers emerging technologies, including wearables, VR/AR, and robotics for safety monitoring and training.
 - Roles and Responsibilities: Delivered lectures and contributed to course design, including lecture materials and VR-based term projects. Guided students individually on project development, held office hours, and assisted with grading and assessment.

Spring 2025

Co-Instructor, CEE 598 – Construction Robotics (35 students)

- Course Details: CEE 598 introduces students to core challenges and technologies in construction automation and robotics, including robot kinematics, sensing, control, and programming. Also, emphasizes hands-on skills using Python/MATLAB and covers emerging applications of robots during construction operations.
- Roles and Responsibilities: Delivered lectures and led weekly lab sessions. Designed and implemented the final project on developing a low-cost mobile robot for hazard detection. Supported students with programming exercises, project work, and one-on-one guidance. Managed office hours and assisted with grading.

TEACHING EXPERIENCE AT PENN STATE

Spring 2022

Teaching Assistant, AE 597 – Data Science for Construction Safety

- Course Details: AE 597 introduces graduate students to the integration of data science and machine learning for construction safety applications. The course also covers construction safety fundamentals, data-driven risk analysis, and practical implementation of classification, prediction, and anomaly detection models using real-world construction datasets.
- Roles and Responsibilities: Assisted course instructor in designing course content and assignments, reviewed and provided feedback on term projects, supported students during office hours, and led multiple lab sessions and instructional lectures.

Fall 2021

Teaching Assistant, AE 475 – Building Construction Engineering I

- Course Details: AE 475 provides an overview of building construction systems, materials, and methods, emphasizing construction engineering principles, project delivery, and the integration of design and construction processes.
- Roles and Responsibilities: Held weekly lab lectures, developed lab materials and assignments, designed in-class exercises, assisted with term project development, provided one-on-one student support during office hours, and contributed to grading course materials.

MENTORING EXPERIENCE**MENTORING EXPERIENCE AT UIUC**

2024-2026

Nilsen Karahan: Undergraduate Student

- Mentored on research problem framing, experimental design, and conference paper preparation for a project investigating automation strategies in off-site modular construction.

2023-2026

Zainab Memon: Undergraduate Student

- Mentored on research problem formulation, system design, and conference paper development for a project focused on smart home automation tools and their application in intelligent built environments.

2023-2024

Yuming Zhang: Ph.D. Student

- Mentored on immersive VR-based training research for construction workers, focusing on problem formulation, experimental design, and academic writing. (4 proceedings, 1 book chapter)

2023-2024

Yogesh Gautam: Ph.D. Student

- Mentored on research involving wearable sensing and artificial intelligence for construction safety, with guidance on problem formulation, signal processing methods, and academic writing. (1 journal, 3 proceedings, 2 book chapters)

2023-2024

Xiayu Zhao: Ph.D. Student

- Mentored on general research skills, including problem formulation, experimental design, literature review, and academic writing. (2 proceedings)

2022-2023

Ali Sharifironizi: Master's Student

- Mentored on general research skills, including problem formulation, experimental design, literature review, and academic writing. (*1 journal, 3 proceedings*)

MENTORING EXPERIENCE AT PENN STATE

- 2021-2022 Madeline Breneman: Schreyer Honors Master's Student
- Mentored on her honors thesis focused on understanding the adoption challenges of exoskeleton use on construction workers' task performance; mentored the writing of a conference paper titled, "*Breaking Down Barriers: A Study of Challenges to Adopting Powered Exoskeletons in the US Construction Industry*" (presented at International Conference of Computing in Civil Engineering 2023; [\[Link\]](#))
- 2021-2022 Anika Sengul: Undergraduate Student
- Mentored as part of the BE-SURE program on foundational research skills, including problem formulation, literature review, and academic writing. Supervised the development and presentation of her research, "*Limitations to the Implementation of Exoskeletons in the United States*," showcased at the 2022 BE-SURE Poster Session.
- 2021-2022 Carolina Manrique Paez: Undergraduate Student
- Mentored as part of the BE-SURE program on foundational research skills, including problem formulation, literature review, and academic writing. Supervised the development and presentation of her research, "*Advantages to the Implementation the Implementation of Exoskeletons in the United States*," showcased at the 2022 BE-SURE Poster Session.
- 2020-2021 Jonathan Seagers: Undergraduate Student
- Mentored on foundational research skills, including problem formulation, literature review, and academic writing; mentored the writing of a conference paper titled, "*Construction Safety Training and their Evaluations Approaches: A Systematic Literature Review*," (presented at 8th International Conference on Construction Engineering and Project Management; [\[Link\]](#))
- 2020-2021 Michael Lowry (K-12 Teacher)
- As part of the NSF-RET summer outreach program, mentored on curriculum-aligned research activities and taught foundational skills for adopting VR technologies to enhance immersive learning in the K-12 classroom
- 2020-2021 Philip Wood (K-12 Teacher)
- As part of the NSF-RET summer outreach program, mentored on curriculum-aligned research activities and taught foundational skills for adopting VR technologies to enhance immersive learning in the K-12 classroom.

OUTREACH TRAINING & WORKSHOP ORGANIZATION

- 2025 City Designers and Builders Camp, UIUC
- As a Ph.D. student in the RAISE Lab, co-organized and led robotics workshops for high school students as part of the lab outreach initiative. The hands-on activity involved building and testing educational robots based on a platform originally developed through my research on low-cost robots for fall hazard detection.
- 2025 Robotics in Construction Seminar for UIUC Engineering Freshmen, UIUC
- Co-led seminar design and delivery for first-year engineering students, focused on building low-cost UGVs integrated with computer vision. Provided instruction and supervision during hands-on activities, demonstrating real-world applications of robotics in construction.
- 2024 City Designers and Builders Camp, UIUC
- Co-organized and led robotics workshops for high school students as part of the RAISE Lab outreach initiative. The hands-on activity involved building and testing educational robots based on a platform originally developed through my research on low-cost robots for fall hazard detection.

- 2024 Robotics in Construction Seminar for UIUC Engineering Freshmen, UIUC
- Co-led seminar design and delivery for first-year engineering students, focused on building low-cost UGVs integrated with computer vision. Provided instruction and supervision during hands-on activities, demonstrating real-world applications of robotics in construction.
- 2022 Partnership for Achieving Construction Excellence (PACE), Penn State
- Co-organized and facilitated RAISE Lab-led roundtable discussions and workshops with academic and industry partners, focusing on automation and robotics innovations for construction. Contributed to session planning, speaker coordination, and research demonstrations.

PROFESSIONAL EXPERIENCE

- 2018 – 2019 **Field Engineer**
Dream Developers, Lalitpur, Nepal
- Analyzed financial/resource constraints and schedule considerations
 - Preliminary quantity take-off for budgetary scopes
- 2017 **Intern**
Department of Urban Development and Building Construction, Jumla, Nepal
- Designed plans of government building projects
 - Performed quantity take-off for budgetary scopes

SERVICE ACTIVITIES & PROFESSIONAL LEADERSHIP

Professional Committees

- 2021 – Present **Member**, Global Center for Excellence in Computing, Technical Committee, ASCE.
- 2021 – Present **Member**, Data Sensing and Analysis (DSA) Committee, Technical Committee, ASCE.

Journal Reviewer (SELECTED)

- 2024- Present Automation in Construction, Elsevier
- 2024- Present Safety Science, Elsevier
- 2024- Present Robotics and Autonomous Systems, Elsevier
- 2024- Present Results in Engineering, Elsevier
- 2023- Present Building and Environment, Elsevier
- 2022- Present IEEE Transactions on Transportation Electrification

Affiliations

- 2020 – Present **Student Member**, American Society of Civil Engineers (ASCE)

COMPUTER SKILLS

Programming: C#, C++, MATLAB, Python, R, JavaScript, Julia, SQL

Building Information Modeling: AutoCAD, Revit, Bluebeam-Revu, SketchUp, Navisworks, BIM 360, ArchiCAD, MicroStation, Trimble Connect

Scheduling and Project Planning: Microsoft Project, Primavera P6

Visualization and Simulation: Unity(C#), SolidWorks, 3ds Max, Blender, Gazebo

REFERENCES

Available upon request