R A H M A N A Z A R I

Director, RE^2 Lab
Associate Professor | Director of Professional Graduate Programs in Architecture
Affiliate Associate Professor of Architectural Engineering
Co-funded faculty member, Institute of Energy and the Environment
Pennsylvania State University (Penn State)

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RESEARCH AREAS

Life cycle assessment (LCA) and embodied carbon modeling of buildings and cities
Data-driven modeling of urban energy and carbon resilience
Innovative building skin solutions for energy harvesting
Digital twins for carbon avoidance and enhanced indoor air quality

EDUCATION

2008 – 2013 Ph.D. in *Built Environment (Sustainability track)*
College of Built Environments, University of Washington, Seattle, WA

1996 – 2002 Master of *Architecture*
College of Architecture, Sahand University of Technology, Iran

ACADEMIC APPOINTMENTS

2020 – present Associate Professor, Department of Architecture
Affiliate Associate Professor, Department of Architectural Engineering
Pennsylvania State University, University Park, PA

2023 (Fall) Visiting Scholar, Department of Architecture
University of Cambridge, UK

2017-2020 Assistant Professor, Architecture
College of Architecture, Illinois Institute of Technology (IIT), Chicago, IL

2013-2017 Assistant Professor, Architecture
Department of Architecture, University of Texas San Antonio, San Antonio, TX

2008-2013 Pre-doctoral Teaching/Research Associate
College of Built Environments, University of Washington, Seattle, WA

2005-2008 Lecturer, Architecture
Iran

ADMINISTRATIVE

09.2024 – present Director of Professional Graduate Programs in Architecture
Pennsylvania State University, University Park, PA

01.2018 – 06.2019 Interim Director of Architecture PhD Program
Illinois Institute of Technology (IIT), Chicago, IL

06.2016 – 06.2017 Graduate Advisor of Record (Director of Graduate Programs)
Department of Architecture, University of Texas San Antonio, San Antonio, TX

TEACHING

Penn State
ARC380/381 Building Environmental Systems I/II (undergraduate)
ARC 431/491/536 High-Performance Building (HPB) Studio (undergraduate/graduate)
ARC 533 Architectural Design Studio (graduate)

IIT
ARCH 403/404 Environment and Building Systems (undergraduate students)
ARCH 601 Doctoral Methodology (doctoral)
ARCH 602 Crafting a Dissertation (doctoral)

University of Texas San Antonio
ARC 2233/4183 Environmental Systems (undergraduate)
ARC 5773 Environmental Life-cycle Assessment (graduate)
ARC 6136 High-Performance Design Studio (graduate)
ARC 6973 Computational Lighting (graduate)

SUMMARY OF ACOMPLISHMENTS

Research

Patent Application: Artificial Leaf-based Façade Cladding system for energy production and carbon absorption.

Funded Research: Co-PI in the $25 million Department of Energy-funded BSEC project (~6M Penn State share), PI in research grants funded by Council on Tall Buildings and Urban Habitat (CTBUH) and AECOM (2023), American Institute of Architects Upjohn Grants (2019, 2020), Penn State LiMC2, Institute of Energy and the Environment, and Stuckeman Center for Design Computing.

Other Research: Lead co-organizer of 2022 International Embodied Carbon Symposium, bringing together 26 scholars from 18 universities in 11 countries.

Recognition: 2019 'Researcher to Know' by the Illinois Science and Technology Coalition.

Editorial: Associated Editor of the ASCE Journal of Architectural Engineering, Editorial member of the journal of 'Buildings', Guest co-editor of the journal of *Energy and Building*'s Special Issue on embodied energy and carbon efficiency (2018). Co-editor of two Special Issues for *Buildings* (2021-2023)

Publications: Lead co-editor of two books. More than 40 publications as peer-reviewed journal articles, book chapters, peer-reviewed conference papers, and research reports.

Teaching

Advised 7 undergraduate Schreyer Scholars at Schreyer Honors College at Penn State
Chairedl; Advised, or served on the Committees of more than 20 PhD and Master's theses.
Developed and taught 10 undergraduate and graduate lecture or studio courses covering sustainable design, environmental systems, environmental LCA, and research methodology.

Service & Outreach

External: US National Expert in the International Energy Agency Annex 89. Volunteer teaching in Afghan Female Students Outreach. American Institute of Architects' Presidential appointment to serve as a jury for the 2023 AIA COTE Top Ten Competition student award. External Examiner for the University of Cambridge Architecture PhD Symposium (2023). Senior Panel Fellow by the NSF CMMI Game Changer Academies. Associate Editor for the Journal of Architectural Engineering. NSF Review Panelist – LEAP-HI program. Program committee member in the NSF-funded Workshop on Architectural Faculty in Environmental Sustainability (WAFES) Research (Toronto, 2019). Ex-officio member and PhD Programs' liaison of the Architectural Research Centers Consortium (ARCC) Board of Directors. Chaired sessions and served as scientific and organizing member of several international conferences. Provided peer-review to book proposals and articles submitted to several journals. Served as a member of ASHRAE, SBSE, and IBPSA.

Internal: Served as member of department-level, college-level, or university-level committees at Penn State, IIT, and UT San Antonio. Interim Architecture PhD program Director at IIT. Led the development of the new Master of High-Performance Buildings program at IIT. Co-led the publication of IIT PhD program's new journal, Prometheus. Lead the annual PhD symposium of the IIT College of Architecture (2018, 2019). Co-organized IIT Carbon Management Symposium. Directed architecture graduate programs at UT San Antonio.

Awards

Sustainability Faculty College Award, College of Arts and Architecture, Penn State (2024)
Faculty advisor to award-winning Solar Decathlon Competition entries with Penn State (2022)
Best Research Development Hackathon Award, NSF-funded WAFES workshop, 2019
Travel grants, Swiss Federal Office of Energy (2018, 2019, 2022)
Faculty co-sponsor in a 2018 National Design Award of Excellence by Society of American Registered Architects (SARA).
Faculty co-sponsor in a 2017 COTE Top Ten student award by AIA & ACSA.
Faculty co-sponsor in a 2016 COTE Top Ten student award by AIA & ACSA.
Co-instructor in the 'New Housing Models' studio accepted into *Architecture 2030 Curriculum Project* (2016).
College nominee for *President's Distinguished Achievement Award – Teaching Excellence*, UT San Antonio, 2017
Dean's Outstanding Teaching Award, College of Architecture, Construction and Planning, UT San Antonio, 2016
ASC Travel Grant, Associated Schools of Construction, 2013
SBSE Scholarship, Society of Building Science Educators, 2012
Fellowship, University of Washington, total $24,000 (tuition-waiver, monthly stipend), 2008-2009
Jeffery Cook Memorial Scholarship, Society of Building Science Educators, 2007

PATENT APPLICATION

Artificial Leaf-based Facade Cladding (ALFC) system for energy production and carbon sequestration; International Publication Application Number: WO 2020/005483 A1
Co-inventors: Rahman Azari, Mohammad Asadi

FUNDED RESEARCH

2025 [1] **Azari, R. (PI)**, Kitzsimons, K. (co-PI), Guimaraes, T. (co-PI), Iulo, L. (co-PI). DECODE: Digital twin Environments for COmprehensive Decarbonization Evaluation of the urban and rural real estate. Funded by Penn State Cocoziello Institute for Real Estate Innovation, Total: $50,000.

2024 [2] Iulo, L. (PI), **Azari, R. (co-PI)**, Blumsack, S. (co-PI), Pavlak, G. (co-PI). Designing Scalable and Adaptable O2-Grid Communities in Remote U.S. Areas: Implementing Hybrid Renewable Energy Systems. Funded by Penn State Cocoziello Institute for Real Estate Innovation, Total: $60,000.

2024 [3] **Azari, R. (PI)**, *"Urban Net-Zero Energy and Carbon Policies in Germany,"* International Research Travel Award. Funded by: Penn State Center for Global Studies. Total: $4,000.

2023-2024 [4] Blumsack, S. (PI), **Azari, R. (Co-PI)** *"The 2024 Pennsylvania Climate Impact Assessment and Climate Action Plan,"* Funded by: ICF Consulting, Total: $50,000

2022-2027 [5] **Azari, R. (PI)**, *"Carbon Emission Models for Urban Habitats (CEMUH),"* Funded by: Council on Tall Buildings and Urban Habitat (CTBUH) and AECOM, Total: $15,000

2022-2023 [6] Peng, W. (Co-PI), **Azari, R. (Co-PI)**, Clark, S. E. (Co-PI), Davis, K. J. (PI), Duncan, J. M. (Co-PI), Forest, C. E. (Co-PI), Hadjimichael, A. (Co-PI), Iulo, L. D. (Co-PI), Lombardo, K. (Co-PI), McPhillips, L. (Co-PI), Miles, N. L. (Co-PI), Najjar, R. (Co-PI), Nicholas, R. (Co-PI), Obonyo, E. A. (Co-PI), Pan, Y. (Co-PI), Richardson, S. J. (Co-PI), Sznajder, K. E. K. (Co-PI), Wu, H. (Co-PI), Zuo, W. (Co-PI), "The Baltimore Social-Environmental Collaborative IFL," Funded by U.S. Department of Energy, Total: $25 million ($6.3 million Penn State share)

2022-2024 [7] **Azari, R. (PI)**, Woias, P. (PI, University of Fribourg, Germany). *"Responsive Facades as Thermoelectric Battery Systems,"* Funded by: Convergence Center for Living Multifunctional Material Systems (LiMC^2), Penn State, Total: $100,000

2022-2023 [8] **Azari, R. (Co-PI)**, Freihaut, J. (Co-PI), Obonyo, E. (PI), *"Sustainable Building Modules*," Funded by Department of Environmental Protection, Commonwealth of Pennsylvania. Total: $100,000

2022-2023 [9] **Azari, R. (PI)**, Iulo, I. (co-PI), Mahdavi, M. (co-PI), Sabbagh, M. (co-PI), "*Urb-EC: Urban Embodied Carbon: Impacts of urbanization on embodied carbon performance of the building sector in cities,"* Funded by: Institute of Energy and the Environment (IEE) & Global Building Network (GBN), Penn State, Total: $29,100 (+ $25,800 tuition in-kind contribution)

2022-2023 [10] **Azari, R. (PI)**, Mahdavi, M. (co-PI), *"Urban Modeling for Operational Carbon (UMOC)",* Funded by: Stuckeman Center for Design Computing (SCDC), Penn State, Total: $18,900 (+$12,900 tuition in-kind contribution)

2021-2023 [11] **Azari, R. (PI)**, Zahed, M. (co-PI), *"A Roadmap to Achieve Carbon Neutrality in the Building Sector of MENA Countries,"* Funded by: Farzaneh Family Foundation, Total: $25,000 (+$25,000 stipend and tuition in-kind contribution)

2021-2022 [12] **Azari, R. (associate faculty)**, Fini, E. (PI, ASU), Bandosz (PI, CUNY), Welch, E. (PI, ASU), Parast, M. (PI, ASU), Yazdani, H. (PI, Howard), "*Planning Grant: Engineering Research Center for Innovative Built and Regenerative Environments for Advancing Timeless Habitability and Equity (I-BREATHE),"* Funded by: National Science Foundation, Total: $100,000

2020-2021 [13] **Azari, R. (Co-PI)**, Wu, H. (PI), Rosas, C. (co-PI), "*Healthy Interactive K-12 Educational Environments for the Pandemic Times and Beyond,"* Funded by: Penn State College of Arts and Architecture, Total: $5,000

2019-2020 [14] **Azari, R. (PI)**, Asadi, M. (co-PI), *"Evaluation of Thermal and Energy Generation Performance of Artificial Leaf-based Facade Cladding (ALFC) systems,"* Funded by: American Institute of Architects (AIA Upjohn Grant) & Penn State, Total: $50,000

2018-2019 [15] **Azari, R. (PI)**, Asadi, M. (co-PI), Pour, F. (collaborator), "*Development of Artificial Leaf-based Facade Cladding (ALFC) systems for energy production and carbon sequestration,"* Funded by: American Institute of Architects (AIA Upjohn) & Illinois Institute of Technology, Total: $50,000

2015 – 2016 [16] **Azari, R. (PI)**, Pinto, J. (Student PI), Maradni, A. (Student PI), Paul, J. (Student PI), *"Curtain wall facade for water collection on tall buildings,"* Funded by: Council for Tall Building and Urban habitats (CTBUH), Total: $20,000 (student grant)

2014 – 2015 [17] **Azari, R. (PI)**, *"Benchmarking of Environmental Impacts of Buildings,"* Funded by: University of Texas San Antonio Intra SEED Grant, Total: $5,000

2013 – 2015 [18] **Azari, R. (co-PI)**, Saadet Beeson (PI), *"STEM Principles Implementation in Building Technology Education,"* Funded by: University of Texas San Antonio Intra SEED Grant, Total: $5,000

[19] **Azari, R. (co-PI)**, Rashed-Ali, H. (PI), Beeson, S. (co-PI), *"Redesigning ARC4183 for Improved*

Quantitative Literacy," Funded by: University of Texas San Antonio QLP program, Total: $15,000

OTHER RESEARCH EXPERIENCE

2022 [20] **Azari, R.** (lead co-organizer, co-chair), Moncaster, A. (co-organizer), Rasmussen, F. (co-organizer), *2022 International Embodied Carbon Symposium*

2018 [21] **Azari, R.** (PI), Stephens, B. (co-PI), Ditchman, N. (co-PI), *"Research Partnership with AIA in Design and Health Research,"* American Institute of Architects (AIA)

2013 [22] **Azari, R.** (Student Research Associate), Migliaccio, G. (PI), Lin. K.Y. (PI), "*Training of Construction Workers for Fall Fatality,"* Funded by: Occupational Safety and Health Administration (OSHA)

2012 – 2013 [23] **Azari, R.** (Student Research Lead), Dossick, C. (PI), Simonen, K. (PI), Al-Anwar, O. (PI). "*Modular Prefabricated Mid-rise Buildings,"* Funded by: Skanska USA Building

2012 – 2013 [24] **Azari, R.** (Student Research Associate), Cheng, C. (PI), Dossick, C. (PI), "*Integration at its Finest: Success in High-Performance Building Design and Project Delivery in the Federal Sector,"* Funded by: American Institute of Architects (AIA)

2012 – 2013 [25] **Azari, R.** (Student Research Associate), Dossick, C. (PI), Taylor, J. (PI) *"Cyber-enabled Global Research Infrastructure for Design Networks,"* Funded by: National Science Foundation

2010 – 2012 [26] **Azari, R.** (Student Research Associate), Kim, Y.W. (PI), Ballard, G. (PI), *"Innovative Project Delivery Paradigm,"* Funded by: Construction Industry Institute (CII)

2010 [27] **Azari, R.** (Student Research Associate), Friedman, D. (PI), O'Mara, M. (PI), "*Next City Project,"* Funded by: University of Washington

BOOKS

Azari, R., Moncaster, A. (2023). The Routledge Handbook on Embodied Carbon in the Built Environments. Edited book. Routledge. New York, USA.

Azari, R., Rashed-Ali, H. (2021). Research Methods in Building Science and Technology. Edited book. Springer Nature, Switzerland.

JOURNAL EDITORIAL

Associate Editor, American Society of Civil Engineer's (ASCE) Journal of Architectural Engineering

Editorial Member and Journal of Smart and Sustainable Built Environments

Guest Co-editor, Journal of Buildings' Special Issue on Advanced Materials and Systems for Energy-Efficient Buildings (2022-2023); co-edited with Ali Memari (Lead, Penn State), Ehsan Kamel (NYIT)

Guest Co-editor, Journal of Buildings' Special Issue on Performance-Based Urban Design: Integrated Urban Analytics, Simulation and Climate-Responsive Design, 2021-2022

Guest Co-editor, Journal of Energy and Buildings' Special Issue on Embodied Energy and Carbon Efficiency, 2017-2018

JOURNAL ARTICLES

[1] Othman, H., Sieves, G., Guimaraes, T., **Azari, R.**, (2026). A Calibration Chamber Framework for Low-Cost Indoor Air Quality Sensor Validation. Building and Environment (287). 113856.

[2] Mohajerzadeh, Z., **Azari, R.**, Nozariasbmarz, A. (2025). Review: Enhancing building energy efficiency through the integration of phase change materials (PCMs) and Thermoelectric Generators (TEGs) into the building envelope. Journal of Building Engineering (108). 112919.

[3] Korsavi, S., **Azari, R.**, Iulo, L., Mahdavi, M. (2025). Determinants of U.S. residential energy consumption at national and state levels: Policy implications. Energy Policy (202), 114594.

[4] Othman, H., **Azari, R.**, Guimaraes, T. (2024). Low-Cost IoT-based Indoor Air Quality Monitoring. Technology, Architecture and Design (TAD) Journal. Pp. 250-270.

[5] Talaei, M. **Azari, R**. (2024). Smart Building Skins for Urban Heat Island Mitigation: A review. Journal of Architectural Engineering 30(4).

[6] **Azari, R.**, Janardhanan, A. (2024). A Carbon Emission Model of Urban Habitats in High-Density Neighborhoods. *Vertical Urbanism (1). Pp. 134-141.*

[7] **Azari, R.**, Kamel, E., Memari, A. (2024). Current Developments and Future Directions in Energy-Efficient Buildings from the Perspective of Building Construction Materials and Enclosure Systems, Buildings (14), 1921.

[8] Ghasemi, E., **Azari, R.**, Zahed, M. (2024). Carbon Neutrality in the Building Sector of the Global South—A Review of Barriers and Transformations. Buildings 14(2), 321.

[9] Ma, L., **Azari, R.**, Elnimeiri, M. (2024). A building information modeling-based life cycle

assessment of the embodied carbon and environmental impacts of high-rise building structures: a case study. Sustainability 16(2), 569. pp.1-13

[10] Zhang, J., **Azari, R.**, Poerschke, U., Hall, D.M. (2023). A Review of Potential Electrochemical Applications in Buildings for Energy Capture and Storage. Micromachines, 14, 2203. https://doi.org/ 10.3390/mi14122203

[11] Talaei, M., Mahdavinejad, M., **Azari, R.**, Motevali Haghighi, H., & Atashdast, A. (2022). Thermal and energy performance of a user-responsive microalgae bioreactive façade for climate adaptability. Sustainable Energy Technologies and Assessments (52). P 101894

[12] *(open access)* Esmaeilirad, M., Baskin, A., Kondori, A., Matias, A.S., Qian, J., Song, B., Saray, M.T., Kucuk, K., Belmonte, A.R., Delgado, P.N.M., Park, J., **Azari, R.**, Segre, C., Shahbazian-Yassar, R., Prendergast, D., Asadi, M. (2021). Gold-Like Activity, Copper-Like Selectivity of Heteroatomic Transition Metal Carbides for Electrocatalytic Carbon Dioxide Reduction Reaction. Nature Communications 12(1). pp. 1-10

[13] Talaei, M., Mahdavinejad, M., **Azari, R.**, Prieto, A., & Sangin, H. (2021). Multi-objective optimization of building-integrated microalgae photobioreactors for energy and daylighting performance. Journal of Building Engineering (42). pp. 1-27

[14] Talaei, M., Mahdavinejad, M., **Azari, R.** (2020). Thermal and Energy performance of Algae Bioreactive Façades: A review. Journal of Building Engineering (28), pp. 1-14

[15] Lin, K.Y., Lee, W., **Azari, R.**, Migliaccio, G. (2018). Training of Low-Literacy and Low-English-Proficiency Hispanic Workers on Construction Fall Fatality, ASCE Journal of Management in Engineering 34(2). 10.1061/(ASCE)ME.1943-5479.0000573

[16] **Azari, R.**, Garshasbi, S., Amini, P., Rashed-Ali, H., Mohammadi, Y. (2016). Multi- objective optimization of building envelope design for environmental performance. Energy and Buildings 126. pp. 524-534.

[17] **Azari, R.**, Kim, Y. (2016). An integration evaluation framework for integrated design teams of green projects: development and validation. ASCE Journal of Management in Engineering 32(3), 10.1061/(ASCE)ME.1943-5479.0000416, 04015053

[18] **Azari, R.** (2014). Integrated energy and environmental life cycle assessment of office building envelopes. Energy and Buildings 82, pp. 156-162.

[19] Dossick, C., Anderson, A., **Azari, R.**, Taylor, J. (2014). Messy talk in virtual teams; achieving knowledge synthesis through shared visualization. ASCE Journal of Management in Engineering. 31(1). DOI: 10.1061/(ASCE)ME. 1943-5479.0000301, A4014003

[20] Kim, Y., **Azari, R.**, Yi, J.S., Bae, J. (2013). Environmental impact comparison of onsite vs. prefab-JIT rebar supply systems. Journal of Civil Engineering and Management, 19(5), pp. 647-655.

[21] **Azari, R.**, Kim, Y. (2012). Comparative assessment of environmental life cycle impacts of curtain wall mullions. Building and Environment, 48(2), pp. 135-145.

BOOK CHAPTERS

[22] **Azari, R.** (2023). Embodied Decarbonization in North America. In Azari, Rahman; Moncaster, Alice (Eds.), The Routledge Handbook of Embodied Carbon in the Built Environment; Routledge.

[23] **Azari, R.**, & Du, P (2022). Assessment of Tall Building Environmental Sustainability; Frameworks and Tools. In Al-Kodmany; Kheir; Du, Peng; Ali, Mir M. (Eds.), Sustainable High-Rise Buildings; Design, Technology, and Innovation; Council on Tall Building and Urban Habitat (CTBUH) and IET.

[24] **Azari, R**., & Singery, M. (2022). Laminated Timber Buildings; An Overview of Environmental Impacts. In Sayigh, A. (Eds.), *Wood and Timber in sustainable buildings;* Springer Nature.

[25] **Azari, R.,** & Badri, N. (2021). Life Cycle Assessment as a Research Methodology for Estimating the Environmental Impacts of Buildings. In Azari, R.; Rashed-Ali, Hazem (Eds.), *Research Methods in Building Science and Technology;* Springer Nature.

[26] Khan, Z., & **Azari, R.** (2021). Outdoor Thermal Comfort & Human Behavior Factors, Models, and Methodologies. In Azari, R.; Rashed-Ali, Hazem (Eds.), *Research Methods in Building Science and Technology;* Springer Nature.

[27] **Azari, R.** (2019). Life-Cycle Energy Consumption in Buildings; Embodied + Operational. In: V. Tam and K.N. Le (Eds.), *Sustainable Construction Technologies: Life-Cycle Assessment*; Elsevier Science Ltd.

[28] **Azari, R.**, Singery, M. (2013). Sustainable buildings and relationship with humans and nature. In: A. Sayigh (Eds.), *Sustainability, Energy and Architecture*; Elsevier Science Ltd.

PEER-REVIEWED CONFERENCE PAPERS

[29] Zhang, J., **Azari, R**., Poerschke, U. (2025). Variations of Energy Storage across Building Types in Building-Integrated Photovoltaic-Regenerative Fuel Cell Facades: A Study of ASHRAE 2B Hot-Dry Climate Zone (Phoenix, AZ). Sustainable Built Environment Conference, IOP Conference Series: Earth and Environmental Science, ETH Zurich, Switzerland, June 26.

[30] Mohajerzadeh, Z., **Azari, R**., Nozariabmarz, A. (2025). Energy Harvesting by Integrating Thermoelectric Generators (TEG) and Phase Change Material (PCM) into the Building Envelope. Architectural Research Centers Consortium (ARCC) Conference, Washington D.C., April 3.

[31] Zhang, J., **Azari, R**., Poerschke, U. (2025). Hydrogen Storage in Building Envelope-Integrated Reversible Fuel Cells: A study of the effects of Different Climates. Architectural Research Centers Consortium (ARCC) Conference, Washington D.C., April 3.

[32] Gharaibeh, I., **Azari, R**., Pavlak, G. (2025). A Review of Modular Construction Role in Reducing Buildings' Environmental Impacts. Architectural Research Centers Consortium (ARCC) Conference, Washington D.C., April 2.

[33] Ghasemi, E., **Azari, R**., Janardhanan, A., Iulo, I. (2025). Estimation Of Window-to-wall Ratio at City Scale Using Object Detection Method; An Automated Scalable Approach. Architectural Research Centers Consortium (ARCC) Conference, Washington D.C., April 2.

[34] Kenanah, T., **Azari, R**., Hadighi, M. (2025). Riyadh's Rapid Urbanization and Climate Challenges: A Sustainable Path Forward for Vision 2030. Architectural Research Centers Consortium (ARCC) Conference, Washington D.C., April 2.

[35] Othman, H., Sieves, G., Guimaraes, T., **Azari, R.** (2024). Development of a Calibration Chamber to Evaluate the Performance of a Low-Cost IAQ Sensing Device. SIGraDi 2024 Biodigital Intelligent Systems Conference, Barcelona, November 13-15.

[36] Adib, M., K. Janardhanan, A., Tariq, T., Iulo, I., Wu, H., **Azari, R.** (2024). Community-based Approaches to Creating Adaptive Solutions for Urban Challenges: Two Case Studies. Architectural Research Centers Consortium (ARCC) Conference, Aarhus, May 25.

[37] Zhang, J., **Azari, R.**, Poerschke, U. (2024). Energy Storage Capability of Building Rainscreen Cladding Panels Integrated with Photovoltaic and Reversible Proton Exchange Membrane Fuel Cells. Architectural Research Centers Consortium (ARCC) Conference, Aarhus, May 25.

[38] Taherian, H., **Azari, R.**, Warren, M. (2024). A Net-Zero Energy Aging-In Place Solar-Powered House Design, 2024 (7th) Residential Building Design and Construction Conference, The Pennsylvania State University, University Park, PA, USA, May 27-28.

[39] Tasneem T., Memarian, S., Iulo, L., **Azari, R.**, (2024). A Review of Relationships between Residential Environments and Human Health, The Pennsylvania State University, University Park, PA, USA, May 27-28.

[40] Othman, H., **Azari, R.** (2023). Exploring low-cost sensors for indoor air quality monitoring: a review of stationary and mobile sensing systems. C+++: Computation, Culture, and Context, Amman, Jordan.

[41] Khan, Z., **Azari, R.**, Stephens, B. (2020). Outdoor thermal comfort in human interaction-based studies; a review. Building Performance Analysis and SimBuild Conference, ASHRAE and IBPSA-USA, Chicago, IL, September 29 – October 1, 2020.

[42] **Azari, R.**, Palomera-Arias, R. (2019). Environmental and economic implications of building envelope design. Architectural Research Centers Consortium (ARCC) Conference, Toronto, May 29-June 1.

[43] **Azari, R.,** Caine, I. (2017). Applying performative tools in the academic design studio: a systemic pedagogical approach, Architectural Research Centers Consortium (ARCC) Conference Proceedings, pp. 38-46.

[44] Beeson, S., **Azari, R.** (2016). STEM Principle Implementation in Building Technology Education in Texas Universities. International Conference on Structures and Architecture Proceedings. pp. 919-926.

[45] Kim, Y., **Azari, R.**, Angeley, J. (2016). Benchmarking Tool for Integrated Design Process. International Group for Lean Construction Conference, Boston, July 20-22.

[46] Farahbakhsh, E., **Azari, R.** (2015). Energy efficiency through building envelope in high- rise buildings. 2nd International Sustainable Building Symposium. Turkey. May 28-30.

[47] **Azari, R.**, Palomera-Arias, R. (2015). Building envelopes; a comparison of impacts on the environment. 2015 ASCE Architectural Engineering Institute Conference (Milwaukee) Proceedings, pp. 230-236.

[48] Palomera-Arias, R., **Azari, R.** (2014). Thermal performance analysis of un-insulated and owner insulated masonry residential buildings in northwestern Mexico using state-space simulation and lumped parameter modeling. 2014 World Sustainable Building Conference, Barcelona, Oct.

28-30.

[49] **Azari, R.**, Kim, Y. (2014). Development and validation of a framework for evaluation of integrated design teams of sustainable high-performance buildings. Proceedings of 2014 Construction Research Congress (Atlanta), pp. 584-593.

[50] Anderson, A., Dossick, C., **Azari, R.**, Taylor, J. (2014). Exploring BIMs as avatars: using 3D virtual worlds to improve collaboration with models. Proceedings of Construction Research Congress (Atlanta), pp. 179-188.

[51] **Azari, R.**, Kim, Y., Ballard, G., Cho, S. (2014). Starting from scratch: new project delivery paradigms. Proceedings of 2014 Construction Research Congress (Atlanta), pp. 2276-2285.

[52] **Azari, R.**, Kim, Y. (2013). Evaluation of integrated design process of high-performance green buildings. 49th ASC Annual International Conference Proceedings, California, US, April 9-13.

[53] Dossick, C., **Azari, R.**, Kim, Y., El-Anwar, O. (2013). IPD in practice: sustaining collaboration in healthcare design and construction. Proceedings of ASCE Architectural Engineering Institute conference, pp. 377-386.

[54] **Azari, R.**, Pena, R. (2012). Integrated design to achieve net-zero energy in an urban office building, American Solar Energy Society (ASES) and World Renewable Energy Forum (WREF) 2012 conference, Denver, Colorado, May 13-17.

[55] **Azari, R.**, Kim, Y. (2012). A comparative study on environmental life-cycle impacts of curtain walls. Proceedings of 2012 Construction Research Congress, 1610-1619.

[56] Lin, K., Migliaccio, G., **Azari, R.**, et al (2012). 3D safety training materials on fall-related hazards for limited English proficiency and low literacy construction workers. Proceedings of ASCE Computing in Civil Engineering Conference, pp. 113-120.

[57] **Azari, R.**, Ballard, G., Cho, S., Kim, Y. (2011). A dream of ideal project delivery systems, Proceedings of ASCE Architectural Engineering Conference, pp. 427-436.

[58] Cho, S., Ballard, G., **Azari, R.**, Kim, Y. (2011). Development of innovative project delivery systems for healthcare projects, Proceedings of International Public Procurement Conference, South Korea, August.

RESEARCH REPORTS

[59] **Azari, R.**, Janardhanan, A. (2024). Carbon Emission Models for Urban Habitats (CEMUH). Final Report to Council on Tall Buildings and Urban Habitat (CTBUH) and AECOM.

[60] **Azari, R.**, Blumsack, S., Guo, J., et al. (2023). Coordinating and Accessing Low-Income Energy Efficiency Programs. White Paper. Penn State Center for Energy Law & Policy.

[61] Ghasemi, E., **Azari, R.**, Zahed, M. (2023). Barriers to Carbon Neutrality in the Global South Countries. Report to Farzaneh Family Foundation.

[62] **Azari, R.**, Asadi, Mohammad (2021). A Framework to Evaluate the Energy Performance of Artificial Leaf-based Façade Cladding (ALFC) Systems. Research Report to American Institute of Architects.

[63] **Azari, R.**, Asadi, Mohammad (2020). Development of Artificial Leaf-based Facade Cladding (ALFC) systems for energy production and carbon sequestration. Research Report to American Institute of Architects.

[64] **Azari, R.** (2016). Benchmarking of Environmental Impacts of Buildings. Research Report to UT San Antonio.

[65] Beeson, S., **Azari, R.** (2015). STEM principles implementation in building technology education in Texas universities. Research Report to UT San Antonio.

[66] **Azari, R.**, Dossick, C., Al-Anwar, O., Kim, Y. (2013). Leveraging collaboration for productivity improvement in healthcare construction projects. Research Report to University of Washington.

[67] Dossick, C., Al-Anwar, O., Simonen, K., **Azari, R.**, *et* al (2013). Modular prefabricated mid-rise residential construction. Research Report to Skanska USA Building.

[68] Ballard, G., Kim, Y., **Azari, R.**, Cho, S. (2012). Starting from scratch: new project delivery paradigms, Research Report to Construction Industry Institute (CII), Austin, Texas.

BOOK TRANSLATION

[69] Co-translated (into Farsi): Lechner, N. (2002). Heating, cooling, lighting; design methods for architects, John Wiley & Sons, US; (620 pages). Translation book published in Iran by Tabriz I.A. University Press, 2007.

[70] Co-translated (into Farsi): Moore, F. (1993). Environmental control systems; heating, cooling, lighting, McGraw-Hill, US; (427 pages). Translation book published in Iran by Tabriz I.A. University Press, 2003.

OTHER PUBLICATIONS

[71] **Azari, R**. (2024). Climate change, cities, and net-zero emission buildings. Invited blog posting for the Penn State Institutes of Energy and Environment news blog.

[72] **Azari, R**. Obonyo, E. (2021). Hydrofluorocarbons saved the ozone layer but are warming the earth. Invited blog posting for the Penn State Institutes of Energy and Environment news blog.

PRESENTATIONS & INVITED SPEECH

[1] (*Invited presentation*) Opportunities in Teaching of High-Performance Sustainable Design to Architecture Students. Penn State College of Arts and Architecture Teaching Roundtable Series. September 11, 2024.

[2] Cities and Carbon Emissions of Urban Buildings. Urban Systems Science Colloquium Series, Penn State University. February 19, 2024.

[3] *(Invited speaker)*. Cities and Carbon Emissions of Urban Buildings. Construction Management Speaker Series Event at Kent State University. November 16, 2023.

[4] *(Keynote speaker)*. Tackling Embodied Carbon, a Gateway to Net-Zero Emission. The 8th International ICARB Conference, Edinburgh, Scotland. September 26, 2023.

[5] Urban Building Decarbonization. Green Cities Conference. Augsburg, Germany. June 22, 2023.

[6] Embodied Building of Buildings, a Review of Policies and a Case-study. International Society of Industry Ecology (ISIE) Conference. Leiden, Netherlands. July 2, 2023.

[7] (*Invited presentation*) Building Decarbonization. Cornish College of the Arts, Seattle.

[8] (*Invited presentation and panelist*) Operationalizing the Whole Life Cycle Carbon Approach. 2021 Green Building United Symposium, Philadelphia. September 20, 2021. March 7, 2022.

[9] (*Invited presentation*) Challenges and Opportunities of Building Decarbonization. University of Pennsylvania, September 19, 2021.

[10] (*Invited presentation*) How buildings impact the environment. Blue Economy and Sustainability Seminar. Roger Williams University, April 22, 2021.

[11] Operational vs. Embodied Carbon in Buildings. Institutes of Energy and the Environment, Penn State, April 19, 2021.

[12] Questions for Architectural Research in Hybrid Reality, ACSA 109th Conference, March 24, 2021. Co-presenters: Chris Jarrett (UNC-Charlotte), Christina Bollo (UIUC).

[13] Life Cycle Environmental Impacts of Built Environments, Penn State University, 2020

[14] Life Cycle Environmental Impacts of Built Environments, Rice University, 2020

[15] Trends in Energy Research, Swiss-US Energy Innovation Days, Austin, TX, October 2019.

[16] Doctoral Research workshop: From topic definition to communication of dissertation components; an overview. ARCC Conference doctoral workshop, Toronto, May 2019.

[17] Environmental and economic implications of building envelope design. ARCC Conference, Toronto, May 2019.

[18] Do net-zero energy buildings save energy from net cumulative perspective? Advanced Building Skins Conference, Bern, Switzerland, October 2, 2018

[19] Energy and Environmental Impacts of Built Environments. IIT College of Engineering, 2018.

[20] LCA Research in the Built Environment. Lake Flato Architects, May 9, 2016

[21] Benchmarking Tool for Integrated Design Process. International Group for Lean Construction Conference, Boston, July 20-22, 2016

[22] Building envelopes; a comparison of impacts on the environment. 2015 Architectural Engineering Institute Conference, Milwaukee. March 24-27, 2015

[23] LCA of building envelopes. CACP Symposium, San Antonio. November 22, 2014

[24] A framework for evaluation of integrated design teams of sustainable high-performance buildings. Construction Research Congress, Atlanta. May 19-21, 2014

[25] Starting from scratch: new project delivery paradigms. Construction Research Congress, Atlanta. May 19-21, 2014

[26] New trends in sustainable architecture research and practice. Texas Aggregates and Concrete Association Conference, San Antonio. September, 2013

[27] Evaluation of integrated design process of high-performance green buildings. 49th ASC Annual International Conference, California. April 9-13, 2013

[28] Integrated design to achieve net-zero energy in an urban office building, American Solar Energy Society (ASES) conference, Denver, May 13-17, 2012

[29] Towards sustainable built environments, US Gypsum company. September, 2012

SUPERVISION & MENTORSHIP

Doctoral

- Co-advisor, *Shujie Liu* (2025-). Penn State
- Co-advisor, *Tariq Kenanah* (2024-). Penn State
- Co-advisor, *Islam Gharaibeh* (2024-). Penn State
- Advisor and committee chair, *Elnaz Ghasemi* (2023-). Penn State
- Advisor and committee chair, *Zia Mohajerzadeh* (2022-). Penn State
- Advisor and committee chair, *Hanin Othman* (2022-). Penn State
- Lead co-advisor and committee Chair, *Jingshi Zhang* (2021-2025). Penn State
- Outside committee member, *Baraa J. Alkhatatbeh* (2021-2024). Penn State
- Outside committee member, *Enhe Zhang* (2021-). Penn State
- Outside committee member, *Amit Ojha* (2021-). Penn State
- External committee member, *Arash Zarmehr* (2019-2023). University of Central Florida
- External committee member, *Negar Badri* (2016-2024). University of Calgary
- External committee member, *Maryam Talaei* (2016-2020). Tarbiat Modarres University

- Advisor and committee chair, *Zahidah Khan* (2017-2020), IIT
- Advisor and committee chair, *Lijian Ma* (2018-2020). IIT
- Committee member, *Anat Mor-Avi* (2017-2020), IIT
- Committee member, *Ezgi Bay* (2017-2020), IIT
- Committee member, *Omar Al-Mahdy* (2017-2020), IIT
- Committee member, *Eman Saleh* (2017-2020), IIT

Master's

- Co-advisor, *Luke Goghis* (2024-2026), Penn State
- Co-advisor, *Arjun Janardhanan* (2022-2024), Penn State
- Co-advisor, *Sina Memarian* (2021-2023), Penn State
- Committee member, *Tasneem Tariq* (2020-2022), Penn State
- Committee member, *Muharram Kaya* (2014-2016), UTSA
- Committee member, *Mohamed Abo Issa* (2014-2016), UTSA
- Committee member, *Anupam Satumane* (2016-2018), UTSA

Undergraduate

- Architecture lead co-advisor, Penn State entry in 2025 BuildingsNEXT (formerly Solar Decathlon) Design Competition, US Department of Energy
- Architecture lead advisor, Penn State entry in 2023 Solar Decathlon Built Competition, Shortlisted for construction, US Department of Energy
- Faculty advisor, Penn State entry to 2022 Solar Decathlon Design Competition, 3rd place, Retrofit Housing Category, US Department of Energy
- Advisor to 7 undergraduate Schreyer Scholars. Schreyer Honors College, Penn State
- Advisor, *Samantha Seyler*. UTSA's Undergraduate Scholarship Research Award of $2000, 2014

SERVICE

External

- US National Expert in the International Energy Agency Annex 89 (2023-2027)
- Volunteer instructor and member of board of directors at Afghan Female Students Outreach. 2024-present)
- External Examiner for the University of Cambridge Architecture PhD Symposium (November, 2023).
- AIA Presidential appointment to serve as a juror for the 2023 AIA COTE Top Ten Competition student award.
- Jury, Emerging Faculty Award, Building Technology Educators' Society (BTES)
- Ex-officio member and PhD programs' liaison, the Architectural Research Centers Consortium (ARCC) Board of Directors (since August 2018).
- Review Panelist, NSF Panel LEAP HI Engineering for Civil Infrastructure (ECI) Panel; 2022
- Grant Peer Reviewer and Rapporteur, University of Cyprus, Cyprus, 2022.
- Research Grant Peer Reviewer, Universidad de los Andes, Bogota, Colombia, 2021.
- Book Proposal Reviewer, Routledge, 2022.
- Panel Fellow, NSF CMMI Game Changer Academies
- Chair and panel moderator, conference sessions in various ARCC conferences
- Program committee member in the NSF-funded Workshop on Environmental Sustainability Research (Toronto, 2019).

- Engineering CAREER Proposal Writing Workshop, NSF, Washington D.C., 2019.
- Organizing Committee Member, 2019 International Sustainable Building Symposium, Dallas.
- Scientific Committee Member, 2018 Passive and Low-Energy Architecture Conference, Hong Kong.
- Founding Member, Built Environment Education now (BEE*now*; a non-profit organizing promoting education of sustainability in architecture schools), (2015-present)
- Scientific Committee, International Conference of Sustainable and Healthy Cities, UAE. 2014.
- Scientific Committee, International Conference of Advanced Methods of Design and Construction. 2014.
- Peer-reviewer, NSF, DOE, Elsevier, Routledge, Nature Communications, Building and Environment, Energy and Buildings, Renewable Energy, Energy Storage, Cleaner Production, ASCE Journal of Architectural Engineering, ASCE Journal of Management in Engineering, Journal of Sustainable Building Technology and Urban Development, Smart and Sustainable Built Environment (SASBE) Journal, PLEA Conference, Symposium on Integrated/Sustainable Building Equipment and Systems, Construction Research Congress

Penn State

- Advisory board member, Global Building Network, 2022 – 2023
- Faculty Council member, College of Arts and Architecture, 2022-2024
- Search committee member, Stuckeman School of Architecture and Landscape Architecture Director position, 2021-2022, 2022-2023
- Advisory board member, Hamer Center for Community Design, 2021 – present
- Sustainability Council, College of Arts and Architecture, 2020 – present

IIT

- Hosted and mentored visiting doctoral researchers from India, Iran, Italy, and Turkey for 1-year short-term visits
- Co-led the conception and publication of the PhD Program's new journal, Prometheus.
- Served as Interim Director of PhD Program (01.2018-06.2019). In this position, I actively served on doctoral committees, managed the doctoral admission process, developed and implemented the program's assessment plan, organized the program's PhD lecture series, led the organizing of program's annual symposium, and managed the budget and other aspects of the PhD program.
- Co-developed the proposal for the new Master of High-Performance Building Design program as a joint degree between College of Architecture and College of Engineering at IIT. The proposal is currently under review for approval.
- Steered the IIT PhD Symposia on 'Buildings, Cities, Performance', 2018 and 2019.
- Co-organized IIT WISER Carbon Management Symposium, 2018
- Faculty Appointment and Retention Committee, College of Architecture, 2018-2020
- University Faculty Council's Library Committee (UFCLC), 2017-2020
- College's Curriculum Committee. 2018-2020
- College's Library Committee, 2017-2020

UTSA

- Graduate Advisor of Record (2016-2017)
- Committee Membership, 2013 – 2017
  Building Technology Curriculum Committee, Department of Architecture
  Development of Annual Evaluation Scorecard, Department of Architecture Faculty Search Committee, Department of Architecture
  University Graduate Council, Faculty-Elected Representative
  Data Sub-committee (Lead), Graduate Committee for Master of Architecture
  Graduate Program Committee for Master of Architecture
  Graduate Program Committee for Master of Science in Architecture
  PhD Program Feasibility Taskforce for the College of Architecture

UW

- Student Representative in BE doctoral admission, University of Washington, 2010 – 2013

PROFESSIONAL WORK

Competitions

'Drua', Team entry for 2025 LAGI Fiji Competition, 4th Place and listed in featured projects. Team: Mehrdad Hadighi, Matthew Giarrusso, Anushka Acharya, Sarah Renner, Maison Smith, Delaney Minder, John Foreman, Hanin Othman, Joshua Conroy, Hong Wu, Rahman Azari.

Experience

Consulting services on building performance, 2011 – Present

Sustainability Intern, Capital Projects Office, University of Washington, 2010
Architectural designer, Faratarh Ariana, Iran, 2007 – 2008

Accreditation

IBM Data Science Professional Certificate, October 2023
Certified Passive House Consultant, CPHC, Passive House Institute U.S., August 2023
Building Performance Analysis Certificate, Autodesk, 2013
LEED Green Associate, US Green Building Council, 2011-2013
Registered Architect, Iranian Organization of Building Engineering Board, Iran, 2008

Affiliation

International Building Performance Simulation Association (IBPSA-USA)
American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE)
Society of Building Science Educators (SBSE)
Iranian Organization of Building Engineering Board

SKILLS

Architecture	AutoCAD, SketchUP, Revit
Simulation	Gabi, Athena IE4B, Tally, Cove Tool, Sefaira, eQuest, IESVE, EnergyPlus, Radiance
Programing	Python, STATA
Graphics	Adobe Photoshop, Adobe InDesign, Adobe Illustrator

MEDIA

2023

AECOM – Buildings and Places
Council for Tall Buildings and Urban Habitat
Jury – 2023 BTES Emerging Faculty Award
Jury – 2023 AIA+ACSA COTE Top Ten Award

2022

ACSA
Archinect

2021

Penn State: Webinar to explore sustainability, carbon emissions of buildings

2020

Architect Magazine (3)
American Institute of Architects – 2019 AIA Upjohn Research
Illinois Institute of Technology – Curiosity Unplugged Podcast

2019

Illinois Science and Technology Coalition – 2019 Researchers to Know
Illinois Institute of Technology
American Institute of Architects – 2018 AIA Upjohn Research
Architect Magazine (2)

2017

American Institute of Architects – Past Recipients: COTE Top Ten Competition
ACSA – 2017 COTE Top Ten Competition

2016

Architect Magazine (1)
Architecture 2030 Challenge
ACSA – 2016 COTE Top Ten Competition
UT San Antonio