

Mostafa Akbari

ARCHITECTURAL TECHNOLOGIST · DESIGNER

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Summary

Architect and designer, Mostafa Akbari, is an Assistant Professor of Architecture at Tulane University. He has a Ph.D. in Computational Design and Advanced Manufacturing from [Polyhedral Structures Laboratory](#) at the University of Pennsylvania, [Weitzman School of Design](#). He conducts research at the intersection of computational design, digital fabrication, materials science and structural design, and applies that knowledge to design across disciplines, media and scales—from the micro to macro scale. Mostafa's goal is to augment the relationship between design and science by employing design principles inspired and engineered by Nature, and implementing them in the invention of novel design technologies.

Education

University of Pennsylvania

PA, USA

POSTDOCTORAL SCHOLAR (FOCUSED ON PHYSICS-BASED SIMULATION / 4D PRINTING)

Spring 2024

- Polyhedral Structures Lab (PSL), Prof. Masoud Akbarzadeh

University of Pennsylvania

PA, USA

DOCTOR OF PHILOSOPHY IN ARCHITECTURE (COMPUTATIONAL DESIGN AND ADVANCED MANUFACTURING)

2019-2023

- Certificate of *Advanced Scientific Computing*
- Advisor: Dr. Masoud Akbarzadeh (Penn- Architecture), co-advisor: Dr. Andrej Kosmrlj (Princeton- Mechanical Engineering), Committee members: Dr. Tomohiro Tachi (Tokyo-Architecture/ Graphic Science), Dr. Shu Yang (Penn-Material Science), Dr. Franca Trubiano (Penn-Architecture)

University of Pennsylvania

PA, USA

MASTER OF SCIENCE IN DESIGN, ADVANCED ARCHITECTURAL DESIGN

2017-2018

- Concentrating on Computational Design and Robotic Manufacturing
- Winner of the highest merit-based scholarship based on excellent qualifications

Shahid Beheshti University (SBU)

Tehran, Iran

MASTER OF ARCHITECTURE

2013-2016

- Graduated with honors
- Thesis: Marine Passenger Terminal Design Based on Optimizations of Qualitative Aspects of Circulation Utilizing Pedestrian Simulation

University of Tehran

Tehran, Iran

BACHELOR OF ARCHITECTURE

2008-2013

- Graduated with honors

Academic Experience

Architectural Technology, Texas A&M School of Architecture

LA, USA

Assistant Professor of Architecture (Tenure-track)

2025 - PRESENT

- Teaching and conducting research in Architectural Technology, at the intersection of Computational Design, Structures, Material Science, and Mathematics.

Architectural Technology, Tulane University School of Architecture

LA, USA

Assistant Professor of Architecture (Tenure-track)

2024 - 2025

- Courses:
 - Advanced Design Studio** Focusing on designing buildings and structures with complex morphologies, using innovative materials.
 - Advanced Design Media Seminar** Focusing on physics-based simulation and form finding techniques in a parametric design environment.

Tech Designated Elective: Developing Computational Solutions for Design Problems, University of Pennsylvania		PA, USA
Lecturer		2023 - 2024
- Identify, investigate, formulate, and resolve design problems using advanced computational techniques. - Focusing on Material Computation, Structural Form Finding, Parametric Design, and Generative Design (Softwares : Grasshopper, Python) - Co-teach with Yao Lu		
Structures 1, University of Pennsylvania		PA, USA
Teaching Fellow		2023 - 2024
A review of one-dimensional structural elements, a study of arches, slabs and plates, curved surface structures, lateral and dynamic loads, and the survey of current and future structural technology.		
Structures 2, University of Pennsylvania		PA, USA
Teaching Fellow		2023
Basic principles of Statics and Strength of Materials as they apply to the design and analysis of structural members and simple connections.		
Polyhedral Structures Lab (PSL), University of Pennsylvania		PA, USA
Research Associate		2019 - 2024
- Computational form-finding and structural design in the context of graphic statics - Developing novel algorithmic tools for designing cellular structures with complex morphology		
Contemporay Theory (Digitalization), University of Pennsylvania		PA, USA
Teaching Fellow		2021
Teaching around 40 students in two different recitation sessions		
Penn Design Summer Institute, Digiblast workshop, University of Pennsylvania		PA, USA
Teaching Assistant		2021
Enhancing students' abilities to use digital tools		
Material Formation, University of Pennsylvania		PA, USA
Part-time Lecturer		2018 - 2020
Robotic clay-printing and shell topology optimization based on structural analysis		
Advanced Robotic Fabrication In Architecture, University of Pennsylvania		PA, USA
Part-time Lecturer		2018 - 2019
Designing shell-based micro-structures using robotic wire-cutting.		
Advanced Structural Design Studio, University of Pennsylvania		PA, USA
Part-time Lecturer		2018 - 2019
Designing an airport using a geometric structural form-finding technique		
Professional Practice 2, University of Pennsylvania		PA, USA
Teaching Assistant		2018
A series of workshops that introduce students to a diverse range of practices in Architecture.		
Laboratory Assistant, University of Pennsylvania		PA, USA
Graduate Assistant		2018 - 2019
Maker Bot 3D printers hardware and software specialist		
Architectural Design studios 3 and 4, Shahid Beheshti University (SBU)		Tehran, Iran
Teaching Assistant		2014, 2015
Beachelor's program, Structural Design Studio		

Invited Book Chapters

2024	M. Akbarzadeh, M. Akbari, et al. Face-based cellular structures In <i>DETAIL Business Information GmbH, in progress</i> , 2024.
2022	M. Akbarzadeh, M. Akbari, et al. Compression-only Form Finding, Shellular Funicular Structures . In <i>Cambridge University Press</i> , Cambridge, 2022.

Peer-Reviewed Papers

- 2025 Y. Ching, Y. Gao, M. Akbari, et al. [Geometrically Templated, Ultra-Lightweight and High Strength Soap Films from Lyotropic Liquid Crystalline Graphene Oxide/Polymer Composites](#). *Advanced Functional Materials*
- 2024 C. Singert, M. Akbari, et al. [Tuning Agarose-Based Film Properties via Hydrogen Bonding](#). *International Journal of Biological Macromolecules*.
- 2023 M. Akbari, F. Oghazian, J. Bae, F. Davis, L. Mogas-Soldevila, M. Akbarzadeh, [Bio-Based Composite Spatial Shell Structures](#). *proceedings of the IASS Annual Symposium*, Melbourne, Australia 2023.
- 2023 L. Lasting, M. Akbari, A. Weinstein, S. Chawla, L. Mogas-Soldevila, M. Akbarzadeh, [Terrene 2.0 : Biomaterial Systems and Shellular Structures for Augmented Earthen Construction](#). *Materials and Design*, 2023.
- 2023 Z. Hsain, M. Akbari, M. Akbarzadeh, J. Pikul, [Electrochemical Healing as an Alternative to Welding: A Framework for Full Strength Recovery in Fractured Metals](#). *Advanced Materials*, 2023.
- 2022 M. Akbari, M. Akbarzadeh, [Continuous Approximation of Shellular Funicular Structures](#). In *proceedings of the IASS Annual Symposium*, Beijing, China 2022.
- 2022 M. Akbari, M. Akbarzadeh, [The effect of reciprocity on the translation of cellular to shellular funicular structures](#). *Structures*, 2022.
- 2022 M. Akbari, Anvitha Sudhakar, Andrej Kusmrlj, M. Akbarzadeh, [Simulating the Self-folding Behavior of Shell Structures](#). *in progress*, 2022.
- 2022 M. Akbari, M. Mirabolghasemi, A. Akbarzadeh, M. Akbarzadeh, [Strut-based Cellular to Shellular Funicular Polyhedral Materials](#). *Advanced Functional Material*, 2022.
- 2021 M. Akbari, Y. Lu, and M. Akbarzadeh, [From design to the fabrication of shellular funicular structures](#). *Proceedings of the Association for Computer-Aided Design in Architecture (ACADIA)*, 2021.
- 2020 M. Akbarzadeh et al., [Saltatur: Node-based Assembly of Funicular Spatial Structures](#) *Proceedings of the Association for Computer-Aided Design in Architecture (ACADIA)*, 2020.
- 2020 M. Akbari, M. Mirabolghasemi, A. Akbarzadeh, M. Akbarzadeh, [Geometry-based Structural Form-finding to Design Architected Cellular Solids](#) *ACM Symposium on Computational Fabrication (ACM-SCF)*, Virtual Conference, 2020.
- 2019 M. Akbari, M. Bolhasani, M. Akbarzadeh, [From Polyhedral to Anticlastic Funicular Spatial Structures](#) In *proceedings of the IASS Annual Symposium*, Barcelona, Spain, 2019.
- 2018 M. Akbari, W. Huang, [Montreal, Sensate and Augmented](#) In *Pressing Matter 8*, University of Pennsylvania, School of Design, 2018.
- 2016 M. Akbari, K. Safamanesh, L. Bahrami, [Optimization of Qualitative and Motional Aspects Marine Passenger Terminal Based on an Innovative Approach for Pedestrian Simulation](#) In *International Conference on Civil Engineering, Architecture, and Cityscape (ICCACS)*, Istanbul, Turkey, 2016.

Software Products

- 2023 M. Akbari et al., [Fold](#), Grasshopper Plugin for Simulating the Folding Behavior of Origami Structures using Physics-based Simulation (preparing for 4D printing) , 2023.
- 2022 M. Akbari et al., [PolyFrame 2](#), Grasshopper Plugin for designing Shellular Funicular Structures, <https://www.food4rhino.com/app/> , 2022.

Patents, Honors and Awards

- 2023 Patent - M. Akbari et al., Electrochemical Healing of Fractured Metals, patent number 24-10636 .
- 2022 Shellular Funicular Structures research - featured on the cover page of [Advanced Functional Material Journal](#).
- 2020 Winner of the silver [A' Design award](#) for Saltatur structure - Polyhedral Structures Lab.
- 2019 Winner of the full merit-based scholarship for Ph.D. in Architectural Technology at [the University of Pennsylvania](#) based on excellent qualifications.
- 2019 Fusong project - listed as the top 50 best drawings in the [Architizer's one drawing challenge](#).

- 2018 Homuncular Heterotopía - the project featured on the [Notas CPAU Magazine](#).
- 2017 Winner of the highest merit-based scholarship based on excellent qualifications at [the University of Pennsylvania](#).
- 2017 Third place - Digital Design competition, [Master of Advanced Architectural Design, University of Pennsylvania](#).
- 2013 National full scholarship for graduate studies at [Shahid Beheshti University \(SBU\)](#), Tehran, Iran.
- 2013 Ranked 21 among more than 50 thousands applicants on the national university entrance exam for graduate study in Architecture, Iran.
- 2008 National full scholarships for undergraduate studies, Tehran, Iran.

Internal/ External Grants

- 2024 Faculty Research Grant Award, \$10,000, Bio-based Composite Shell Structures, [Center on Climate Change and Urbanism, Tulane University](#).
- 2020 Research development grant due to excellence in research, \$30,000, Shellular Funicular Structures [University of Pennsylvania](#).

Synergistic Activities

- 2025 Peer Reviewer, [International Journal of Structural Engineering and Mechanics](#).
- 2024 Committee member, [Advanced Design Media at Tulane](#).
- 2024 Committee member, [Digital fabrication and advanced manufacturing at Tulane](#).
- 2024 Peer Reviewer, [International Journal of Architectural Computing](#).
- 2023 Peer Reviewer, [Association of Computer Aided Design in Architecture \(ACADIA\)](#).
- 2022 Peer Reviewer, [Association of Computer Aided Design in Architecture \(ACADIA\)](#).
- 2022 Peer Reviewer, [University of Pennsylvania, Ph.D. Conference \(Precarity\)](#).
- 2022 Conference Organizer, [University of Pennsylvania, Ph.D. Conference \(Precarity\)](#).
- 2022 Contributed to the transition of the University into a STEM program, [University of Pennsylvania](#).

Invited Lectures/ workshops

- 2024 [Virginia Tech University, School of Architecture](#) Invited by Prof.Ramtin Haghnazar. Title: *Geometry-based form finding techniques*.
- 2024 [University of Pennsylvania, Weitzman School of Design](#) Philadelphia, U.S., invited by Prof.Richard Farley. Title: *Bio-based shell structures*.
- 2023 [National Museum of American History / The Catholic University of America](#) Washington D.C., U.S., invited by Prof. Tonya Ohnstad. Title: *Nature-Inspired Design and Fabrication of Shell-Based Cellular Structures*.
- 2022 [University of Pennsylvania, Weitzman School of Design](#) Philadelphia, U.S., invited by Dr.Masoud Akbarzadeh. Title: *Designing Shellular Funicular Structures (workshop)*.
- 2022 [University of Tehran](#) Tehran, Iran, (virtual talk), invited by Dr. Katayoon Taghizadeh. Title: *Shell-based cellular funicular structures*.
- 2021 [World CAAD Ph.D workshop](#) virtual talk, invited by SIGraDi. Title: *Ph.D. thesis, Shellular Funicular Structures*.
- 2019 [City Collage of New York](#) New York, U.S., invited by Dr. Mohamad Bolhassani. Title: *3D Graphic Statics (workshop)*.

Professional Experience

AEDS

[LA, USA](#)

ARCHITECTURAL/STRUCTURAL DESIGN CONSULTANT

2024-PRESENT

- Architectural Designing, Concept Designing, Structural Designing and Structural Analysis for Tad Gormley Stadium in New Orleans.

Gensler

CA, USA

PROFESSIONAL ARCHITECTURE SUMMER INTERN

2018

- Architectural designing, digital rendering, advanced 3D modeling, and building information modeling.
- Attending Evolo competition as a part of the internship program.

Intelligent Design Studio

Tehran, Iran

CHIEF ARCHITECT, COMPUTATIONAL DESIGNER

2015 - 2017

- Designing and supervising the execution of interior design projects.

Diargah Consultant

Tehran, Iran

JUNIOR ARCHITECT

2013 - 2014

- Architectural designing, digital rendering, and 3D modeling.

U.N. Agencies

Tehran, Iran

YOUNG REGISTERED MEMBER

2002 - 2003

- Working with UNESCO and WHO as a young registered member.

Design Competitions

2018	Evolo Idea Competition
2018	HOK Future Design Challenge
2015	Kish Parkway and International Square Design
2015	Mirmiran Bionic Conceptual Design
2014	The Gugenheim Helsinki Museum Design

Skills

Programming Languages	Python, Java, C++, Processing, Arduino.
Digital Fabrication	ABB/Universal Robot Arm 3D printing and Wire-cutting.
3D Modeling	Maya, Rhino, Grasshopper, Blender, Revit, 3DMax, AutoCad, Sketch up.
Presentation	Latex, Adobe Suite, Keyshot, Vray.
Others	Ansys, 4D printing, VR HTC Vive, Pedestrian Dynamics.
Languages	English, Persian, French (Intermediate), Arabic (Intermediate).