

Mostafa Akbari

ARCHITECT · COMPUTATIONAL DESIGNER

1430N, 31st street, Philadelphia, PA, USA

☎ (+1) 267-251-0007 | ✉ akbariae[at]design.upenn.edu | 🏠 www.mostafaakbari.net | 📺 MostafaAkbari | 📄 GoogleScholar

Summary

Architect and designer, Mostafa Akbari, is a Ph.D. researcher at [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

DOCTOR OF PHILOSOPHY IN ARCHITECTURE (FOCUSED ON ADVANCED STRUCTURAL DESIGN AND MATERIAL COMPUTATION)

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

Tech Designated Elective: Developing Computational Solutions for Design

PA, USA

Problems, University of Pennsylvania

LECTURER

2023 - PRESENT

- 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 |, University of Pennsylvania

PA, USA

TEACHING FELLOW

2023 - PRESENT

- A review of one-dimensional structural elements; a study of arches, slabs and plates, curved surface structures, lateral and dynamic loads; survey of current and future structural technology.

Structures ||, 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 - PRESENT

- 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	
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
• Bachelor's program, Structural Design Studio	

Invited Book Chapters

- 2022 M. Akbarzadeh, M. Akbari, [Compression-only Form Finding, Shellular Funicular Structures](#). In *Cambridge University Press, in progress*, Cambridge, 2022.

Peer-Reviewed Papers

- 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*, in peer review, 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*, in peer review, 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 Anual 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.

Honors and Awards

- 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.

Synergistic Activities

- 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 \(Precarity\)](#).

Invited Lectures/ workshops

- 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

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 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).