Masoud Akbarzadeh *Sep 20, 1981*

Last update on March 2, 2017

masouda@design.upenn.edu • +12155937586 • masoud.akbarzadeh *(Skype)* • www.linkedin.com/in/masoudakbarzadeh • psl.design.upenn.edu

Summary

Creative designer with a unique academic background and experience in architectural design, computation, and structural engineering.

Masoud Akbarzadeh is an assistant professor of architecture in *Structures and Advanced Technologies* and the director of the *Polyhedral Structures Laboratory* (PSL) at the University of Pennsylvania School of Design (PennDesign). He holds a PhD from the Institute of Technology in Architecture, ETH Zurich, where he was a research assistant in the Block Research Group. He holds two degrees from MIT: a Master of Science in Architecture Studies (Computation) and an MArch, the thesis for which earned him the renowned SOM award. He also has a degree in Earthquake Engineering and Dynamics of Structures from the Iran University of Science and Technology and a BS in Civil and Environmental Engineering. His main research topic is Three-Dimensional Graphical Statics, which is a novel geometric method of structural design in three dimensions.

Research Interests

3D graphical statics using polyhedral reciprocal diagrams, graphical statics, structural form finding, computational design, architectural design, computational geometry, structural design, spatial structures, architectural geometry, polyhedral geometry, geometric optimization, digital fabrication techniques, infrastructural design, hydraulic design, applied mathematics, graph theories

Education

Swiss Federal Institute of Technology — Zurich, Switzerland
Doctor of Science — *2012 – 2016*
Thesis title: *3D Graphical Statics Using Reciprocal Polyhedrons*.Advised by P. Block, W. F. Baker (SOM).

Massachusetts Institute of Technology — Cambridge, MA, USA
Master of Science in Architectural Studies Design and Computation — *2010 – 2012*
Thesis title: *Designing performative surfaces: computational interpretation of flow pattern drawings.*
Advised by T. Nagakura, D. Shelden, and J. Lamere

Massachusetts Institute of Technology — Cambridge, MA, USA
Master of Architecture — *2007 – 2011*
Thesis title: *Hydropower cities: a new candidate for future*. Advised by N. Tehrani.

Iran University of Science and Technology — Tehran, Iran
Master of Science in Earthquake Engineering and Dynamics of Structures — *2004 – 2007*
Thesis title: *Characteristics of vertical spectrum of earthquake in near–field regions and its effects on dynamic responses of bridges*. Advised by M. Zahedi.

Zanjan University — Zanjan, Iran
Bachelor of Science in Civil and Environmental Engineering — *1999 – 2004*

Fellowship/Award

Swiss Federal Institute of Technology — Zurich, Switzerland
ITA Fellowship Award — *2012 – 2016*
Fully–funded PhD position from the Institute of Technology in Architecture (ITA), Department of Architecture (DArch).

Skidmore, Owings and Merrill LLP — Chicago, USA
SOM Prize — *2011*
Travel research fellowship for architecture, design and urban design.

Massachusetts Institute of Technology — Cambridge, MA, USA
Merit–Based Scholarship — *2008 and 2011*
Full–tuition award to study architecture at MIT Department of Architecture.

Massachusetts Institute of Technology — Cambridge, MA, USA
First Prize — *2010*
Show Case Competition at MIT Department of Architceture.

Massachusetts Institute of Technology — Cambridge, MA, USA
Scholarship — *2007 and 2010*
Half–tuition award to study MArch and SMArchs at MIT Department of Architecture.

Iran University of Science and Technology — Tehran, Iran
Scholarship — *2007*
Ranked among 2 percent of 11,300 attendants in national graduate entrance exam.

Zanjan University — Zanjan, Iran
Scholarship — *1999*
Ranked among 0.01 percent of 300,000 attendants in national undergraduate entrance exam.

Teaching Experience

University of Pennsylvania, School of Design — Philadelphia, PA, USA
Assistant Professor of Architecture in Structures and Advanced Technologies — *Jul '16 – present*

Contemporary Architects Association — Tehran, Iran
Instrctor — *Jun '16 – Aug '16*
HedraCrete; a workshop on 3D Graphical Statics and techniques in fabricating complex concrete, polyhedral structures, taught by M. Akbarzadeh, M. Mahnia, A. H. Tabrizi, and R. Taherian.

University of Stuttgart, ILEK — Stuttgart, Germany
Instructor — *Jun '15*
Funicular Funnel Shell Design; a workshop on form finding using RhinoVAULT and the fabrication process of a specific type of shells with tensile and compressive members, taught by M. Rippmann, M. Akbarzadeh, and O. Gericke.

ETH Zurich, DArch — Zurich, Switzerland
Invited Jury/ Student Consultant — *Fall & Spring '13, '14, '15*
Structural Design I, II, taught by Prof. Dr. Philippe Block.

MIT, Department of Architecture — Cambridge, MA, US
Teaching Assistant — *Spring '12*
Architectural Design Studio Level II, taught by Prof. Ana Miljacki.

Harvard Graduate School of Design — Cambridge, MA, US
Instructor — *IJP '12*
Interlock: Plywood Design/Build Workshop, taught by Masoud Akbarzadeh and Arash Adel.

MIT, Department of Architecture — Cambridge, MA, US
Teaching Assistant — *Fall '11*
Geometric Disciplines and Architectural Design Skills, taught by Prof. Joel Lamere.

MIT, Department of Architecture — Cambridge, MA, US
Teaching Assistant — *Spring '11*
Soft Wood: Architectural Design Workshop, taught by Prof. Sheila Kennedy and Nick Gelpi.

MIT, Department of Architecture — Cambridge, MA, US
Instructor — *IAP '11*
Point Crowd: Rhino Script Workshop Using Python Programming Language, taught by Ari Kardasis and Masoud Akbarzadeh.

MIT, Department of Architecture — Cambridge, MA, US
Teaching Assistant — *Fall '10*
Architectural Design Studio Level I, taught by Prof. William O'Brien Jr.

MIT, Department of Architecture — Cambridge, MA, US
Teaching Assistant — *Fall and Spring '08 '09, '10*
Geometric Disciplines and Architectural Design Skills I, II, taught by Prof. Joel Lamere.

Experience

Block Research Group, ITA, ETH Zurich — Zurich, Switzerland
Research Assistant — *Oct '12 – Jun '16*
Developing the methods of 3D graphical statics as the main area of research and collaborating in design and fabrication of small and large scale structural prototypes, such as Nest floor prototype and Funicular Funnel Shell Prototype at ILEK, Stuttgart, Germany.

Masoud Akbarzadeh Studio — Zurich, Switzerland

Structural Consultant — *May '14*

Designing the structural concept of a competition entry for Augusta Raurica Archaeological Center in Basel, Switzerland.

Architectural Consultant — *Sep '12 – Dec '12*

Designing an expressive facade for a commercial building as well as the entrance space for the building and the bridges connecting the building to the street.

NADAAA — Boston, MA, US

Architectural Designer/Researcher — *Jun '10 – Aug '10*

Involved in the design of a private residence in Washington DC, and an invited competition to design a wall in Austin, TX, US.

Architectural Designer/Researcher — *Jun '09 – Aug '09*

Involved in the conceptual design process of the School of Architecture, University of Toronto, Canada, and the School of Architecture, Melbourne University, Australia.

Ana Miljacki — Cambridge, MA,US

Architectural Designer/Researcher — *Jan '09 – Feb '09*

Prepared a design proposal for the expansion of the Center for Real Estate at MIT, Cambridge, MA, US.

Paul Lukez Architecture — Cambridge, MA,US

Architectural Designer/Researcher — *Jun '08 – Aug '08*

High rise Design, 3000 housing units in Xiamen, Fujian, China.

Invited Lecture/Presentation

University of Pennsylvania, School of Design — Zurich, Switzerland

Invited Speaker in MASTERLECTURE Series, part of ARCH602 course. — *Feb '17*

ETH Zurich, (NCCR) Digital Fabrication — Zurich, Switzerland

Invited Speaker for students of Master of Advanced Studies (MAS). — *Feb '16*

International Association of Shell and Spatial Structures — Amsterdam, The Netherlands

Paper Presentation at the Structural Morphology Group session. — *Aug '15*

Amirkabir University of Technology — Tehran, Iran

Invited Speaker at the Department of Computer Science and Mathematics — *Oct '14*

International Association of Shell and Spatial Structures — Brasilia, Brazil

Paper Presentation at the Structural Morphology Group session. — *Sep '14*

Association for Computer-Aided Design in Architecture — Cambridge, Ontario, Canada

Paper Presentation at the conference with the main theme: Adaptive Architecture. — *Oct '13*

International Association of Shell and Spatial Structures — Wroclaw, Poland

Paper Presentation at the Structural Morphology Group session. — *Sep '13*

University of Florida, School of Architecture — Gainesville, FL, USA

Invited lecture as a shortlisted candidate for a tenure-track position in architecture. — *Mar '12*

Administrative and collective duties

John Stewardson Competition — USA

Jury — *Feb '17*

The John Stewardson Memorial Fellowship in Architecture competition.

Computer-Aided Design Journal — USA

Technical Reviewer — *Feb '17*

A leading international journal focusing on research and developments in the application of computers to design.

International Association of Shell and Spatial Structures — Amsterdam, The Netherlands

Co-Chair — *Oct '14*

The Computation and Geometry Session in Structural Morphology Group.

TAD the Journal of Technology, Architecture, and Design — USA

Technical Reviewer — *Nov '16*

The inaugural issue of the Journal of TAD.

The Symposium on Simulation for Architecture and Urban Design — USA, UK

Technical Reviewer — *Apr '15, '16*

SimAUD 2015 and SimAUD EU 2016.

Publications

Akbarzadeh M., Van Mele T. and Block P., 2016. Three-dimensional graphic statics: Initial explorations with polyhedral form and force diagrams, *International Journal of Space Structures*, 31(2): 217-226.

Akbarzadeh M., Van Mele T. and Block P., 2015. On the Equilibrium of Funicular Polyhedral Frames and Convex Polyhedral Force Diagrams, *Computer-Aided Design*, 63:118-128.

Akbarzadeh M., Van Mele T. and Block P., 2015. 3D Graphic Statics: Geometric Construction of Global Equilibrium, *Proceedings of the International Association for Shell and Spatial Structures (IASS) Symposium*,Amsterdam, The Netherlands.

Akbarzadeh M., Van Mele T. and Block P., 2015. Spatial compression-only form finding through subdivision of external force polyhedron, *Proceedings of the International Association for Shell and Spatial Structures (IASS) Symposium*,Amsterdam, The Netherlands.

López López D., Veenendaal D., Akbarzadeh M. and Block P., 2014. Prototype of an ultra-thin, concrete vaulted floor system. *Proceedings of the IASS-SLTE 2014 Symposium*, Brasilia, Brazil.

Akbarzadeh M., Van Mele T. and Block P., 2014. Compression-only form finding through finite subdivision of the force polygon. *Proceedings of the IASS-SLTE 2014 Symposium*, Brasilia, Brazil.

Akbarzadeh M., 2013. Performative surfaces: Adaptive tools to generate complex geometry using planar flow patterns, in: *Adaptive Architecture*, Waterloo/ buffalo/ Nottingham, ACDADIA, Cambridge, Ontario, Canada.

Akbarzadeh M., Van Mele T., Block P., 2013. Equilibrium of Spatial Structures using 3-d Reciprocal Diagrams, in: J.B., O., Tarczewski, R. (Eds.), *Proceedings of IASS Symposium 2013, BEYOND THE LIMITS OF MAN*, Wroclaw University of Technology, Poland.

Akbarzadeh M., 2011. Robot arm, in: Hirschman, S. (Ed.), *Testing To Failure, Design and Research in MIT's Department of Architecture*. SA+P Press, pp. 156-157.

Akbarzadeh M., 2009. Tensional integrity, in: Miljacki, A., Pauil, L., Pinney, M., Sleeper, B. (Eds.), *Uncertain Futures, Two Years of Student Research at The MIT Department of Architecture*. SA+P Press, pp. 244-245.

Akbarzadeh M., Ghodarti Amiri G., 2007. Characteristics of vertical spectrum of earthquake in near-field regions and its effects on the dynamic responses of bridges, in: *4th International Conference on Earthquake Geotechnical Engineering*, ICEGE, Greece.