

Arash Adel

Director | [ADR Laboratory](#)

Assistant Professor | [Taubman College of Architecture and Urban Planning, University of Michigan](#)

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Dr. Arash Adel is an Assistant Professor of Architecture at the University of Michigan's Taubman College of Architecture and Urban Planning, where he directs the [ADR Laboratory](#). His laboratory conducts interdisciplinary research at the intersection of design, computation, and robotics, further contributing to resilient, sustainable, and low-carbon construction outlooks and achievements. At the core of his comprehensive research is investigating human-machine collaborative processes, which tackle fundamental questions related to the future of the design and construction industries and their potential to have a broader impact on inclusive and equitable building culture. Adel received his Master's in Architecture from Harvard University and his Doctorate in Architecture from the Swiss Federal Institute of Technology (ETH).

Education

- 2020 **Swiss Federal Institute of Technology (ETH) – Department of Architecture**, Zurich, Switzerland
Doctor of Sciences (Dr. sc. ETH Zurich)
Thesis: Computational Design for Cooperative Robotic Assembly of Nonstandard Timber Frame Buildings
Advisory Committee: Prof. Fabio Gramazio, Prof. Matthias Kohler, Prof. Nader Tehrani, Prof. Jan Willmann
- 2010 **Harvard University – Graduate School of Design**, Cambridge, MA, USA
Master in Architecture (Post-Professional Degree in Architecture)
Cross-Registered: MIT School of Architecture and Planning
- 2008 **University of Tehran – School of Architecture and Urban Design**, Tehran, Iran
Master of Urban Design
- 2004 **Azad University – School of Architecture and Engineering**, Mashhad, Iran
Master of Architecture (Professional Degree in Architecture)

Academic Experience (Selected)

- Jul. 2020-Present **Assistant Professor of Architecture**
Taubman College of Architecture and Urban Planning, University of Michigan, Ann Arbor, USA
- Jan. 2021-Present **Director, ADR Laboratory**
Taubman College of Architecture and Urban Planning, University of Michigan, Ann Arbor, USA
- Jan. 2019-Jun. 2020 **Postdoctoral Fellow/Lecturer in Architecture**
Taubman College of Architecture and Urban Planning, University of Michigan, Ann Arbor, USA
- Sep. 2014-Dec. 2018 **Doctoral Research Fellow**
Institute of Technology in Architecture, Department of Architecture, ETH, Zurich, Switzerland
- Aug. 2013-Aug. 2014 **Weller Fellow in Architecture**
School of Design and Construction, Washington State University, Pullman, WA, USA
- Jul. 2013-Jan. 2014 **Lecturer in Architecture**
College of Environmental Design, University of California Berkeley, Berkeley, CA, USA

Awards/Honors (Selected)

- 2019 **Postdoctoral Fellowship in Architecture**
Taubman College of Architecture and Urban Planning, University of Michigan, Ann Arbor, USA
- 2015 **Architecture & Technology Doctoral Fellowship**
Institute of Technology in Architecture (ITA), Department of Architecture, ETH, Zurich, Switzerland
- 2013 **Weller Research Fellowship in Architecture**
School of Design and Construction, Washington State University, Pullman, WA, USA

Grants

- 2022 National Science Foundation (NSF): "FW-HTF-R: Collaborative Research: Partnering Workers with Interactive Robot Assistants to Usher Transformation in Future Construction Work," Co-Principal Investigator, 2022-2024, **\$2,000,000**.
- 2021 Center for Academic Innovation, University of Michigan: "Programming for Designers Massive Open Online Courses Specialization," Co-Principal Investigator, 2021-2023, **\$180,000** (Cash and in-kind Support).
Herbert W. and Susan L. Johe Fund, Taubman College of Architecture and Urban Planning, University of Michigan: "Robotically Fabricated Structure," Principal Investigator, 2021, **\$65,000**.

- 2021 UMOR, University of Michigan: "Collaborative Construction: Robotic Construction and Mixed Reality-Assisted Human Intervention," Principal Investigator, 2021-2022, **\$14,989**.
Extended Reality (XR) Initiative, Center for Academic Innovation, University of Michigan: "Bridge the Gap Between Digital Design and Physical Construction in Architecture Education with XR," Principal Investigator, 2021-2022, **\$15,000**.
- 2019 UMOR, University of Michigan: "Computational Design and Robotic Manufacturing of Bespoke Timber Façade Components," Co-Principal Investigator, 2019-2021, **\$15,000**.
Prototyping Tomorrow Grant, Taubman College of Architecture and Urban Planning, University of Michigan: "Computational Design and Robotic Manufacturing of Bespoke Timber Façade Components," Co-Principal Investigator, 2019-2022, **\$15,000**.
Postdoctoral Fellowship Grant, Taubman College of Architecture and Urban Planning, University of Michigan: "Robotic Timber Assembly," Principal Investigator, 2019-2020, **\$40,000**.

Publications (Peer-Reviewed Conference and Journal Papers)

- 2022 A. Adel and S. Mozaffari, "Optimized Nail-Laminated Timber Structures Suitable for Robotic Assembly," in *Innovation, Sustainability and Legacy: Proceedings of the International Association for Shell and Spatial Structures (IASS) Annual Symposium*, Beijing, 2022 (Abstract Accepted).
- 2021 M. Bruce, G. Clune, R. Xie, S. Mozaffari and A. Adel, "Cocoon: 3D Printed Clay Formwork for Concrete Casting," in *Realignments: Toward Critical Computation: Proceedings Catalog of the 41st Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)*, Online and Global, 2021.
A. Adel, E. Augustynowicz and T. Wehrle, "Robotic Timber Construction: A Case Study Structure," in *Realignments: Toward Critical Computation: Proceedings Catalog of the 41st Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)*, Online and Global, 2021.
K. Graser, A. Adel, M. Baur, A. Thoma and D. Sanz Pont, "Parallel Paths of Inquiry: Detailing for DFAB HOUSE," *Technology | Architecture + Design*, vol. 5, no. 1, pp. 38-43, 2021.
- 2020 R. Craney and A. Adel, "Engrained Performance: Performance-Driven Computational Design of a Robotically Assembled Shingle Façade System," in *Distributed Proximities: Proceedings Catalog of the 40th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)*, Online and Global, 2020.
A. Adel, "Computational Design for Cooperative Robotic Assembly of Nonstandard Timber Frame Buildings," Ph.D. Thesis, ETH, Zurich, 2020.
- 2018 A. Adel, A. Thoma, M. Helmreich, F. Gramazio and M. Kohler, "Design of Robotically Fabricated Timber Frame Structures," in *Recalibration: On Imprecision and Infidelity: Proceedings Catalog of the 38th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)*, Mexico City, 2018.
A. Thoma, A. Adel, M. Helmreich, T. Wehrle, F. Gramazio and M. Kohler, "Robotic Fabrication of Bespoke Timber Frame Modules," in *Robotic Fabrication in Architecture, Art and Design*, Zurich, 2018.
- 2017 A. Adel, "Architecture After Research," *Memar*, pp. 22-27, 2017.

Projects (Robotically Fabricated Buildings and Structures)

- 2021 **Robotically Fabricated Structure (RFS)**
Matthaei Botanical Gardens, Ann Arbor, MI, USA
Role: Principal Investigator and Project Lead
Industry Partner: Robert Silman Associates Structural Engineers
- 2020 **Multi-Robotic Timber Assembly (A Case Study Structure)**
Stein, Switzerland
Role: Principal Investigator and Project Lead (University of Michigan)
Industry Partner: ERNE AG Holzbau
- 2018 **DFAB HOUSE**
Dubendorf, Switzerland
Role: Project Lead Computational Design (Timber Structure)
Industry Partners: ERNE AG Holzbau, best wood SCHNEIDER GmbH

Exhibitions/Installations

- 2022 **Robotically Fabricated Structure (RFS) 2.0**
ON AIR: Faculty Work 2020-22, Taubman College of Architecture and Urban Planning, Ann Arbor, MI, USA
- 2020 **Video Exhibition: Multi-Robotic Timber Assembly**
Association for Computer Aided Design in Architecture (ACADIA) Conference
- 2014 **Curator's Choice 2014**
Museum of Art at WSU, Pullman, WA, USA

- Research and Design Projects** (Solo Exhibition)
Third Gallery, Moscow, WA, USA
- Weller Research Fellowship Exhibition**
School of Design and Construction, Washington State University, Pullman, WA, USA
- Material Synthesis Design Computation**
School of Art and Architecture, University of Idaho, Moscow, WA, USA
- AIA National Design Week**
River Park Mall, Spokane, WA, USA
- Oblique Interactions**
Artisans Barn Gallery, Uniontown, WA, USA
- Unbuilt Vision**
School of Architecture, Middle East Technical University, Ankara, Turkey
- 2013 **New Perspectives**
School of Design and Construction, Washington State University, Pullman, WA, USA
- 2010 **Graduate Exhibition**
Graduate School of Design, Harvard University, Cambridge, MA, USA
- Interviews/Press Coverage (Selected)**
- 2021 **University of Michigan** (Nov. 15-22, 2021)
Robotically Fabricated Timber Structure was featured on the University of Michigan's homepage for a week.
Ann Arbor, MI, USA
- ClickOnDetroit** (Oct. 27, 2021)
Robotically fabricated wooden pavilion on display at Matthaei Botanical Gardens in Ann Arbor
Ann Arbor, MI, USA
- The University Record** (Oct. 25, 2021)
Matthaei Botanical Gardens debuts robotically fabricated timber structure
Ann Arbor, MI, USA
- The Daily News** (Oct. 22, 2021)
U-M researchers debut robotically fabricated timber structure at Matthaei Botanical Gardens
Iron Mountain, MI, USA
- Michigan News** (Oct. 21, 2021)
U-M researchers debut robotically fabricated timber structure at Matthaei Botanical Gardens
Ann Arbor, MI, USA
- Taubman College of Architecture and Urban Planning, University of Michigan** (Oct. 20, 2021)
Adel, Researchers, and Taubman College Students Debut Robotically Fabricated Timber Structure at U-M's Matthaei Botanical Gardens
Ann Arbor, MI, USA
- Construction Technology** (Sep. 2, 2021)
UM Developing Robotic Assistants to Advance Construction Industry
- Taubman College of Architecture and Urban Planning, University of Michigan** (Aug. 31, 2021)
Faculty Secure \$2M NSF Grant on Human-Robot Collaborative Construction
Ann Arbor, MI, USA
- Taubman College of Architecture and Urban Planning, University of Michigan** (Mar. 19, 2021)
Adel: Ushering Architectural Design and Construction into the Automation Era
Ann Arbor, MI, USA
- 2020 **Portico Magazine** (Issue Spring 2020)
Interviewed for the article "Sustainability by Plan and Design"
Ann Arbor, MI, USA
- 2018 **BBC 4Tech** (Mar. 21, 2018)
Zurich, Switzerland
- 2016 **New Scientist Magazine** (Issue 3056, Jan. 19, 2016)
Interviewed for the article "The House that Bots Built"
London, UK
- Lectures/Symposia**
- 2022 **Robotically Assembled [Timber] Architecture**
College of Architecture, Art, and Planning, Cornell University, Ithaca, NY, USA (Online)

- 2021 **Robotic Construction, Opportunities and Challenges**
Peter Guo-hua Fu School of Architecture, McGill University, Montreal, Canada (Online)
- Cocoon: 3D Printed Clay Formwork for Concrete Casting**
ACADIA 2021 Conference
Online and Global
- Robotic Timber Assembly**
Holzbau Netzwerk Deutschland (Timber Construction Network Germany, Online)
- Keynote: Robotically Assembled [Timber] Architecture**
International Manufacturing Forum, Polytechnic of Leiria, Portugal (Online)
- Robotic Construction, Opportunities and Challenges**
College of Environmental Design, University of California Berkeley, Berkeley, CA, USA (Online)
- Towards a New Mode of Architectural Production**
MODX Network Voices (Online)
- 2020 **Robotic Architecture**
California College of the Arts (CCA), San Francisco, CA, USA (Online)
- Engrained Performance**
ACADIA 2020 Conference
Online and Global
- Human Agency in Computational Design and Robotic Fabrication**
College of Human Ecology, Cornell University, Ithaca, NY, USA
- 2019 **Towards a new Mode of Architectural Production**
Taubman College of Architecture and Urban Planning, University of Michigan, Ann Arbor, MI, USA
- 2018 **Design of Robotically Fabricated Timber Frame Structures**
ACADIA 2018 Conference
Hilton Mexico City Reforma Hotel, Mexico City, Mexico
- Robotic Fabrication of Bespoke Timber Frame Modules**
ROBJARCH 2018 Conference
ETH, Zurich, Switzerland
- 2017 **Encoding Design**
Interaction Design, Zurich University of the Arts, Zurich, Switzerland
- Architecture, Code, and Machine**
Department of Architecture, Texas A&M University, College Station, TX, USA
- Collaborative Robotic Spatial Timber Assembly**
TxA Emerging Design + Technology Conference
Austin Convention Center, Austin, TX, USA
- Towards a new Mode of Architectural Production** (Poster Presentation and Lecture)
Future Cities Laboratory 2nd Annual Conference: Future Cities / Transactions
ETH, Zurich, Switzerland
- 2016 **Connection to Professionalism**
Schwerpunkte 5 Colloquium: Architecture and Professionalism
Werner Oechslin Library Foundation, Einsiedeln, Switzerland
- Site-Less vs. Site-Specific**
Contemporary Architecture Association, Tehran, Iran
- 2015 **Robotically Fabricated Housing**
Institute of Technology in Architecture, ETH, Zurich, Switzerland
- Computing Architecture**
School of Architecture, University of Tehran, Tehran, Iran
- Design Across Scales**
School of Architecture, Rice University, Houston, TX, USA
- Emerging Digital Technologies in Architecture**
College of Architecture and Planning, Ball State University, Muncie, IN, USA
- Design Computation | Practice and Pedagogy**
Faculty of Architecture and Urban Planning, Tarbiat Modares University, Tehran, Iran
- 2014 **Extruded Structures**
Department of Architecture, ETH, Zurich, Switzerland
- Parametric Design Practices Symposium** (Committee Member and Panel Moderator)
School of Design and Construction, Washington State University, Pullman, WA, USA

Weller Research Fellowship Lecture

School of Design and Construction, Washington State University, Pullman, WA, USA

Digital Design and Practice in Architecture

Moscow City Hall, Moscow, WA, USA

Material Synthesis Design Computation

School of Art and Architecture, University of Idaho, Moscow, WA, USA

Interdisciplinary Discussions in Design (Chair and Moderator)

School of Design and Construction, Washington State University, Pullman, WA, USA

2013 **Representation**

College of Environmental Design, University of California Berkeley, Berkeley, CA, USA

Performance-driven Design

School of Architecture and Urban Planning, University of Wisconsin, Milwaukee, WI, USA

Leadership and Service

Taubman College

2020-Present Director, Programming for Designers Specialization (Massive Open Online Courses)

Member, Ph.D. in Architecture Advisory Committee

Member, Ph.D. in Architecture Curriculum Committee

2019-Present Member, Ph.D. in Architecture Admission Committee

2019 Member, Master of Science in Digital and Material Technologies Admission Committee

University of Michigan

2020-2021 Member, Laboratory and Research Safety Committee

2019-2020 Supervisor, Undergraduate Research Opportunity Program (UROP)

Scientific Committees

2021 Peer-review for conference papers, CAAD Futures

Peer-review for conference papers, Association of Collegiate Schools of Architecture (ACSA) Annual Meeting

2020-Present Peer-review for conference papers, Association for Computer-Aided Design in Architecture (ACADIA)

Courses Taught (Selected)

University of Michigan

2022 ARCH 600 – Tutor Studies Arch (Independent Study)

2021 ARCH 702 – Robotic Engagement

ARCH 801 – Doctoral Colloquium

ARCH 739 – MS DMT Capstone

ARCH 708 – Systems Engagement / ARCH 825 – Doctoral Area Seminar - BT System Engagement

2020 ARCH 709 – Computational Design

ARCH 739 – MS DMT Capstone

2019 ARCH 708 – Systems Engagement / ARCH 825 – Doctoral Area Seminar - BT System Engagement

ARCH 333 – Representation * Fabrication

ARCH 537 – Fabrication

Washington State University

2014 ARCH 499 – Digital Tectonics II

ARCH 403 – Politics of Form (4th Year Undergraduate Design Studio)

2013 ARCH 496 – Digital Tectonics I

ARCH 301 – Types, Prototypes and Systems (3rd Year Undergraduate Design Studio)

UC Berkeley

ARCH 100A – Fundamentals of Architectural Design (3rd Year Undergraduate Design Studio)

Recognition of Student Work

2022 **Student Show Award** (Honorable Mention)

Mackenzie Bruce, Gabrielle Clune, and Ruxin Xie, "Cocoon: 3D Printed Clay Formwork for Concrete Casting."

Taubman College of Architecture and Urban Planning, University of Michigan

Guest Critic

2019-Present University of Michigan, Ann Arbor, MI, USA

2021 EPFL, Lausanne, Switzerland (Online)

2020 University of Pennsylvania, Philadelphia, PA, USA (Online)
University of Virginia, Charlottesville, VA, USA (Online)
California College of the Arts, San Francisco, CA, USA (Online)
McGill University, Montreal, Canada
University of Oregon, Eugene, OR, USA
The Pennsylvania State University, University Park, PA, USA
2014-2017 ETH Zurich, Zurich, Switzerland
2013, 2014 Washington State University, Pullman, WA, USA
2013 University of California Berkeley, Berkeley, CA, USA
2010, 2012 Harvard University, Cambridge, MA, USA
2011 University of Pennsylvania, Philadelphia, PA, USA
2011 Washington University, St. Louis, MO, USA
2011 Woodbury University, Los Angeles, CA, USA