Yao Lu

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EDUCATION

- **University of Pennsylvania** — Philadelpahia, PA
  ***Ph.D.** in Architecture* — *Aug 2020 - 2024(expected)*
- **Cornell University** — Ithaca, NY
  ***M.S.** in Matter Design Computation* — *Aug 2018 - May 2020*
- **Tongji University** — Shanghai, China
  M.Arch — *Sep 2014 - June 2017*
- **Tongji University** — Shanghai, China
  ***B.Eng** in Architecture* — *Sep 2010 - May 2014*

PUBLICATIONS

PEER-REVIEWED JOURNAL PAPERS

- Yao Lu, Márton Hablicsek, and Masoud Akbarzadeh. Algebraic 3D graphic statics with edge and vertex constraints: A comprehensive approach to extend the solution space for polyhedral form-finding. *Computer-Aided Design*, 166:103620, Jan 2024. doi: 10.1016/j.cad.2023.103620
- Yao Lu, Thamer Alsalem, and Masoud Akbarzadeh. A method for designing multi-layer sheet-based lightweight funicular structures. *Journal of the International Association for Shell and Spatial Structures*, 63(4):252–262, Dec 2022a. doi: 10.20898/j.iass.2022.018
- Yao Lu, Alireza Seyedahmadian, Philipp Amir Chhadeh, Matthew Cregan, Mohammad Bolhassani, Jens Schneider, Joseph Robert Yost, Gareth Brennan, and Masoud Akbarzadeh. Funicular glass bridge prototype: design optimization, fabrication, and assembly challenges. *Glass Structures & Engineering*, 7(2):319–330, Aug 2022b. ISSN 2363-5150. doi: 10.1007/s40940-022-00177-x

PEER-REVIEWED CONFERENCE PAPERS

- Yao Lu, Hua Chai, and Masoud Akbarzadeh. Towards a novel form-finding approach using matrix analysis: exploiting nodal displacements of pin-jointed frameworks. In *Proceedings of IASS Symposium and Spatial Structures Conference 2023, Integration of Design and Fabrication*, Melbourne, Australia, July 2023a
- Yao Lu, Márton Hablicsek, and Masoud Akbarzadeh, Abdolhamid Akbarzadeh. 3D auxetic materials designed with algebraic polyhedral graphic statics. In *Proceedings of IASS Symposium and Spatial Structures Conference 2023, Integration of Design and Fabrication*, Melbourne, Australia, July 2023b
- Joseph Robert Yost, Matthew Cregan, Mohammad Bolhassani, Masoud Akbarzadeh, Yao Lu, Philipp Amir Chhadeh, and Jens Schneider. Experimental investigation of a transparent interface material for glass compression members. In *Proceedings of Challenging Glass Conference 8*, volume 8, Ghent, Belgium, Jun 2022. doi: 10.47982/cgc.8.395
- Mostafa Akbari, Yao Lu, and Masoud Akbarzadeh. From design to the fabrication of shellular funicular structures. In *Proceedings of the 41st Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)*, Virtual, Online, Nov 2021. CUMINCAD. URL https://papers.cumincad.org/cgi-bin/works/paper/acadia21_328
- Yulun Liu, Yao Lu, and Masoud Akbarzadeh. Kerf bending and zipper in spatial timber tectonics: A polyhedral timber space frame system manufacturable by 3-axis cnc milling machine. In *Proceedings of the 41st Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)*, Virtual, Online, Nov 2021. CUMINCAD. URL https://papers.cumincad.org/cgi-bin/works/paper/acadia21_354
- Yao Lu, Matthew Cregan, Philipp Chhadeh, Alireza Seyedahmadian, Mohammad Bolhassani, Jens Schneider, Joseph Yost, and Masoud Akbarzadeh. All glass, compression-dominant polyhedral bridge prototype: form-finding and fabrication. In *Proceedings of the 7th International Conference on Spatial Structures and the Annual Symposium of the IASS*, pages 326–336, Surrey, UK, Aug 2021
- Yao Lu, Eda Begum Birol, Colby Johnson, Christopher Hernandez, and Jenny Sabin. A method for load-responsive inhomogeneity and anisotropy in 3D lattice generation based on ellipsoid packing. In *Proceedings of the 25th Annual Conference of The Association for Computer-Aided Architectural Design Research in Asia (CAADRIA)*, pages 395–404, Bangkok, Thailand, Aug 2020. CUMINCAD. URL http://papers.cumincad.org/cgi-bin/works/paper/caadria2020_257
- Eda Begum Birol, Yao Lu, Ege Sekkin, Colby Johnson, David Moy, Yaseen Islam, and Jenny Sabin. POLYBRICK 2.0: Bio-integrative load bearing structures. In *Proceedings of the 39th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)*, pages 222–233, Austin, USA, October 2019. CUMINCAD. URL http://papers.cumincad.org/cgi-bin/works/paper/acadia19_222

Book Chapters

- (In preparation) Masoud Akbarzadeh, Márton Hablicsek, and Yao Lu. Chapter 7: Algebraic Formulations of Polyhedral Graphic Statics. In Masoud Akbarzadeh (Ed.) *Polyhedral Graphic Statics: A Design Guide For Funicular Structural Form-Finding*. Cambridge University Press

Articles by Others – Featuring Lu's Work

- Edward Keegan. R+D Award: Tortuca. *Architect*, pages 70–71, Aug 2022. URL https://www.architectmagazine.com/awards/r-d-awards/r-d-award-tortuca_o

Honors and Awards

- **2022** IASS Hangai Medal
  Webpage: www.design.upenn.edu/architecture/graduate/post/phd-researcher-wins-hangai-prize-iass-2022
- **2022** R&D Award
  Webpage: www.architectmagazine.com/awards/r-d-awards/r-d-award-tortuca_o
- **2022** DigitalFUTURES Project Award
  Webpage: digitalfutures.international/project-award/
- **2022** Dezeen Award longlisted
  Webpage: www.dezeen.com/awards/2022/longlists/tortuca/
- **2020** Young CAADRIA Award
- **2017** 1st Prize of Youth Design Competition for Suqian City
- **2016** 3rd Prize of International Student Urban Design Competition for Shanghai Railway Station (Group Work)
- **2015** 2nd prize of Shanghai College Students' Modern Drama Festival (Group Work)
- **2014** 1st Prize of Vertical City Asia International Competition (Group Work)
- **2014** 1st Prize of Architecture Competition of Taiwan and Mainland Students (Group Work)
- **2013** 2nd Prize of East Asia Architecture and Urban Planning Competition

Software Products

- **PolyFrame 2** A polyhedral funicular form-finding plug-in for Rhino® and Grasshopper®
  Download: www.food4rhino.com/en/app/polyframe-2
- **Earthworms** A Python scripting environment for Rhino® with enhanced interactivity and flexibility
  Download: www.food4rhino.com/app/earthworms
- **PolyBrick** A load-responsive lattice generation plug-in for Grasshopper® (available upon request)
  Demo: yaolu.page/polybrick_plugin

Teaching

Courses

- **2023 Fall** **Instructor** of the seminar *ARCH 7326 Tech Designated Elective: Developing Computational Solutions for Design Problems* at University of Pennsylvania, co-teach with Mostafa Akbari
- **2023 Spring** **Teaching Fellow** of the design studio *ARCH 602 Generative Prefabrication: A Design Research In Building Prefabrication and Assembly*, Instructor: Prof.Masoud Akbarzadeh
- **2021 Spring** **Teaching Fellow** of the design studio *ARCH 705 Innovative Mid-rise Timber: Timber Tectonics Meets Spatial Force Flow*, Instructor: Prof.Masoud Akbarzadeh
- **2020 Spring** **TA** of the design studio *Cinecitta to Thin Cities*, Instructor: Prof.John Zissovici
- **2019 Fall** **TA** of the design studio *The Anthropocene Style*, Instructor: Prof.Sarosh Anklesaria
- **2019 Spring** **TA** of the design studio *ARCH 5116 Matter Design Computation: Human-centered Adaptive Architecture in the UAE*, Instructor: Prof.Jenny Sabin
- **2018 Fall** **TA** of the lecture *ARCH 2614/5614 Building Technology*, Instructor: Prof.Jonathan Ochshorn

Workshops

- **2023 August** **Instructor** of the *IASS 2023 Masterclass on PolyFrame 2*, co-teach with Prof. Masoud Akbarzadeh
  Webpage: www.iass2023.org.au/masterclasses.php
- **2023 April** **Instructor** of the *Workshop for Summum Engineering on PolyFrame 2*

Guest Lectures And Talks

- **2023 May** **Guest lecture** *Introduction to Polyhedral Graphic Statics* and *Algebraic Formulations of Polyhedral Graphic Statics* for the course *Performance-based Design in Architecture* at Tongji University
- **2022 May** **Guest talk** *Computational design of Tortuca the glass bridge* for the *Glass Bridge Exhibition & Presentation* at the NYC×Design festival. Webpage: festival.nycxdesign.org/event/eventscape-nyc-glass-bridge-exhibition-presentation/

Scholarly Service

- **Since 2022** Peer reviewer, Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA)
- **Since 2021** Peer reviewer, Annual Conference of The Association for Computer-Aided Architectural Design Research in Asia (CAADRIA)

Experience

- **University of Pennsylvania** — Philadelphia, PA
  Teaching Fellow — *Aug 2020 - present*
- **JSLab, Cornell University** — Ithaca, NY
  Research Assistant — *Aug 2018 - May 2020*
- **Cornell University** — Ithaca, NY
  Teaching Assistant — *Aug 2018 - May 2020*
- **Tongji Architectural Design Co. (TJAD)** — Shanghai, China
  Part-time Junior Architect — *Oct 2014 - May 2017*