

# Yao Lu

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Polyhedral Structures Laboratory  
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## EDUCATION

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| • <b>University of Pennsylvania</b><br><i>Ph.D. in Architecture; GPA: 3.88/4.0</i>  | Philadelphahia, PA<br>Aug 2020 - 2024(expected) |
| • <b>Cornell University</b><br><i>M.S. Matter Design Computation; GPA: 3.96/4.0</i> | Ithaca, NY<br>Aug 2018 - May 2020               |
| • <b>Tongji University</b><br><i>M.Arch (Hons); GPA: 4.48/5.0</i>                   | Shanghai, China<br>Sep 2014 - June 2017         |
| • <b>Tongji University</b><br><i>B.Eng (Hons); GPA: 4.27/5.0</i>                    | Shanghai, China<br>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*, 165:103620, Sep 2023
- 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 2022
- 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 2022

### 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 10-14 2023
- 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 10-14 2023
- 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. *Challenging Glass Conference Proceedings*, 8, Jun 2022
- Mostafa Akbari, Yao Lu, and Masoud Akbarzadeh. From design to the fabrication of shellular funicular structures. In *2021 Association for Computer Aided Design in Architecture Annual Conference, ACADIA 2021, November 3, 2021 - November 6, 2021*, Association for Computer Aided Design in Architecture Annual Conference, ACADIA 2021, Virtual, Online, 2021. ACADIA
- 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 *2021 Association for Computer Aided Design in Architecture Annual Conference, ACADIA 2021, November 3, 2021 - November 6, 2021*, Association for Computer Aided Design in Architecture Annual Conference, ACADIA 2021, Virtual, Online, 2021. ACADIA
- 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 *Inspiring the Next Generation: Proceedings of the 7th International Conference on Spatial Structures and the Annual Symposium of the IASS*, page 326–336, Surrey, UK, Aug 2021
- Eda Begum Birol, Yao Lu, Colby Johnson, Christopher Hernandez, and Jenny Sabin. A method for load-responsive inhomogeneity and anisotropy in 3d lattice generation based on ellipsoid packing. In *D. Holzer, W. Nakapan, A. Globa, I. Koh (eds.), RE: Anthropocene, Design in the Age of Humans - Proceedings of the 25th CAADRIA Conference - Volume 1*, Chulalongkorn University, Bangkok, Thailand, 5-6 August 2020, pp. 395-404. CUMINCAD, 2020
- 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 *ACADIA 19:UBIQUITY AND AUTONOMY [Proceedings of the 39th Annual Conference of the Association for Computer Aided Design in Architecture (ACADIA) ISBN 978-0-578-59179-7] (The University of Texas at Austin School of Architecture, Austin, Texas 24-26 October, 2019) pp. 222-233*. CUMINCAD, 2019

## ARTICLES BY OTHERS – FEATURING LU’S WORK

- Edward Keegan. R+D Award: Tortuca. *Architect*, pages 70–71, Aug 2022

## HONORS AND AWARDS

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- **2022** IASS Hangai Medal  
Webpage: [www.design.upenn.edu/architecture/graduate/post/phd-researcher-wins-hangai-prize-iass-2022](http://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](http://www.architectmagazine.com/awards/r-d-awards/r-d-award-tortuca_o)
- **2022** DigitalFUTURES Project Award  
Webpage: [digitalfutures.international/project-award/](http://digitalfutures.international/project-award/)
- **2022** Dezeen Award longlisted  
Webpage: [www.dezeen.com/awards/2022/longlists/tortuca/](http://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

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- **PolyFrame 2** A polyhedral funicular form-finding plug-in for Rhino® and Grasshopper®  
Download: [www.food4rhino.com/en/app/polyframe-2](http://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](http://www.food4rhino.com/app/earthworms)
- **PolyBrick** A load-responsive lattice generation plug-in for Grasshopper® (available upon request)  
Demo: [yaolu.page/polybrick.plugin](http://yaolu.page/polybrick.plugin)

## TEACHING AND INVITED TALKS

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- **2023 Fall** **Instructor** for the graduate course *ARCH 7326 Tech Designated Elective: Developing Computational Solutions for Design Problems* at University of Pennsylvania, co-teach with Mostafa Akbari
- **2023 August** **Masterclass** at IASS 2023 on PolyFrame 2, co-teach with Prof. Masoud Akbarzadeh  
Webpage: [www.iass2023.org.au/masterclasses.php](http://www.iass2023.org.au/masterclasses.php)
- **2023 May** **Guest lecture** for the course “Performance-based Design in Architecture” at Tongji University, co-teach with Prof. Masoud Akbarzadeh
- **2023 April** Workshop for Summum Engineering on PolyFrame 2
- **2022 May** **Guest speaker** of the Glass Bridge Exhibition & Presentation at the NYC×Design festival  
Webpage: [festival.nycxdesign.org/event/eventscape-nyc-glass-bridge-exhibition-presentation/](http://festival.nycxdesign.org/event/eventscape-nyc-glass-bridge-exhibition-presentation/)
- **2023 Spring** **Teaching Fellow** for the M.Arch design studio *ARCH 602 Generative Prefabrication: A Design Research In Building Prefabrication and Assembly*, Instructor: Prof.Masoud Akbarzadeh
- **2021 Spring** **Teaching Fellow** for the M.S.AAD design studio *ARCH 705 Innovative Mid-rise Timber: Timber Tectonics Meets Spatial Force Flow*, Instructor: Prof.Masoud Akbarzadeh
- **2020 Spring** **TA** for the option design studio *Cinecitta to Thin Cities*, Instructor: Prof.John Zissovici
- **2019 Fall** **TA** for the option design studio *The Anthropocene Style*, Instructor: Prof.Sarosh Anklesaria
- **2019 Spring** **TA** for the M.S.AAD design studio *ARCH 5116 Matter Design Computation: Human-centered Adaptive Architecture in the UAE*, Instructor: Prof.Jenny Sabin
- **2018 Fall** **TA** for *ARCH 2614/5614 Building Technology*, Instructor: Prof.Jonathan Ochshorn

## SCHOLARLY SERVICE

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- **2023** Peer reviewer, CAADRIA 2024 (forthcoming)
- **2023** Peer reviewer, ACADIA 2023
- **2022** Peer reviewer, ACADIA 2022
- **2021** Peer reviewer, CAADRIA 2021

# EXPERIENCE

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