RUXIN XIE

Research Associate
School of Architecture, Princeton University
S-110 Architecture Building
Princeton, NJ, 08544

734-882-8500
ruxin.xie@princeton.edu
www.ruxinx.com
Google Scholar | LinkedIn

EDUCATION

University of Michigan, Ann Arbor, MI, USA **2021.07**
- M.S. in Digital and Material Technologies (M.S.D.M.T.). GPA 4.0/4.0
- Thesis: Cocoon: 3D printed clay formwork for concrete casting
- Advisor: Prof. Arash Adel

University of Michigan, Ann Arbor, MI, USA **2020.05**
- M.Arch in Architecture with high distinction. GPA 3.985/4.0
- Thesis: Architecture {AI}
- Advisor: Prof. Matias del Campo, Prof. Sandra Manninger

Xiamen University, Xiamen, Fujian, China **2018.06**
- B.Arch in Architecture
- Thesis: Sponge at Crossroad
- Advisor: Prof. Jie Han, Prof. Liangliang Wang, Prof. Suyv Li

PUBLICATION

Mozaffari, S., Bruce, M., Clune, G., **Xie, R.**, McGee, W., and Adel, A. 2023. "Digital Design and Fabrication of Clay Formwork for Concrete Casting." *Automation in Construction* 154: 104969.

Bruce, M.*, Clune, G.*, **Xie, R.***, Mozaffari, S., and Adel, A. 2022. "Cocoon: 3D Printed Clay Formwork for Concrete Casting." *In Realignments: Toward Critical Computation, Proceedings of the 41st ACADIA Conference*, 400–409. CumInCAD. (* Authors contributed equally to the research.)

Velikov, K., del Campo, M., Denit, L., Hasan, K. N., **Xie, R.**, and Boyce, B. 2022. "Design Engine: Generative Multi-Objective Performance Design Scenarios." In Realignments | Papers for the ACADIA 2021 Conference, edited by K. Dörfler, S. Paracho, J. Scott, B. Bogosian, B. Farahi, J. López, and V. Noel, 122–133.

RESEARCH INTEREST

Exploring computational design, robotics, and material innovation to create adaptive, human-centered environments.

RESEARCH EXPERIENCE

Research Associate at ARG LAB, Princeton University **2024.01 - Now**

My work focuses on the robotic setup and mechanical tooling design for various robotic applications. It integrates structured methodologies for developing efficient workflows, precision tools, and systems designed to project-specific requirements.

i. Led the computational design and management of *Timbrelyn*, a robotically fabricated timber architectural installation for the 2024 Bethel Woods Art and Architecture Festival in Bethel, NY. Drafted the proposal that secured its selection as one of three permanent festival buildings. Actively led and participated in all phases of the project, overseeing robotic fabrication and completing the on-site assembly in three days.

ii. Developed robotic workflows for circular design using reclaimed 2x4 timber. Designed robotic end effectors, including timber grippers, automatic nail guns, tool change systems, and CNC saw stations, to improve precision and efficiency. Integrated PLC systems for ABB robots using TwinCAT 3.0.

Research Assistant, University of Michigan **2019.05 - 2021.07**
Advisor: Prof. Sean Ahlquist

i. Engaged in a two-year research with a primary focus on computational design and advanced fabrication including textile research, structural design, and fabrication techniques. This research revolved around human-centered knitting method, optimization of structural component for knitting installation and customized flooring design.

ii. Conducted comprehensive structural tests and collaborated with the School of Engineering and industrial partners to analyze the test results, aiming to fine-tune and optimize structural design solutions.

Research Assistant, University of Michigan **2020.06 - 2020.09**
Advisors: Prof. Kathy Velikov, Dr. Matias del Campo

i. Designed and developed a parametric 3D building massing generator with integrated city code compliance features. Employed DIVA for Grasshopper to perform extensive thermal, daylight, and solar radiation simulations.

ii. Conducted the literature review and spearheaded the development of an Embodied Carbon Benchmark Study and a Life Cycle Assessment (LCA) methodology for multiple design scenarios.

Research Assistant, University of Michigan **2021.03 - 2021.07**
Advisors: Dr. Mania Aghaei Meibodi, Prof. Wesley McGee

i. Conducted literature review research on robotic 3D printing building enclosure system.

EXHIBITION

Pond **2019.06**
Exhibition at Michigan State University | East Lansing, MI
Researched and prototyped custom foam tile floor puzzles.

Playscape **2019.08**
Exhibit Columbus | Columbus, IN
First outdoor installation, exploring diverse materials to create innovative environments and engage a wider audience.

Playscape **2019.10**
TechTwilight 2019 at AAHOM | Ann Arbor, MI
Researched material systems, prototyped foam tiles, and developed lightweight polycarbonate structural components.

Social Equilibria **2021.06**
Biennale Architettura 2021 | Venice, Italy
Refined prototypes and fabrication processes, and further developed the structural component design.

Topology Optimized Building Envelope 2021.10
Plastic Architecture at The Cooper Union | New York, NY
Proposed using topology optimization to represent mesh relaxation, led design and prototyping, and resolved fabrication constraints through iterative mesh optimization.

Cocoon 2022.03
Taubman College 2021+2022 Architecture Student Show | Online
The annual Student Show features faculty-selected projects from the past academic year, showcasing diverse ideas and approaches from studio work. This year's projects reflect the challenges of the pandemic and a period of disciplinary evolution

Robotically Fabricated Structure 2022.03
Taubman College ARCH 708 Systems Engagement at Matthaei Botanical Gardens | Ann Arbor, MI
As the lead computational designer, collaborated with designers to transform initial napkin sketches into fully programmed digital definitions.
Worked closely with fabricators to integrate robotic constraints, establishing a feedback-informed design system.

Timbrelyn 2024.09
Bethel Woods Art and Architecture Festival 2024 | Bethel, NY
Led computational design and management of the robotically fabricated timber workflow. Drafted the design proposal that secured its selection as the permanent festival installation. Oversaw and participated in all phases of the project.

HONORS AWARDS

Honorable Mention 2022.04
Taubman College Announces Annual Student Show Awards

Rackham Graduate Student Research Grant 2021.05

Taubman College Merit-based Tuition Scholarship 2020.03

Honorable Mention 2018.08
The "Street-Corner Urbanism" Conceptual Design Competition, Sydney, Australia

Excellent Awards 2015.08
The 2nd Tangible Fabrication Competition for College Students from Mainland China and Taiwan, Fuzhou, Fujian, China

First Prize 2015.05
The 5th Tangible Fabrication Student Competition at Xiamen University, Xiamen, Fujian, China

PROFESSIONAL EXPERIENCE

Technical Designer at Gensler, San Jose, CA 2021.08 - 2023.12
i. Produced construction documents and 3D models, conducted building code compliance checks and due diligence, participated in large-scale campus design projects across all phases (Concept, SD, DD, CD), and created physical models for internal and external presentations.

ii. Implemented computational workflows within Gensler's design technology sector, instructed tutorials on Rhino-Grasshopper-Revit-Dynamo integration, on Rhino/Revit models with BIM360, and on BIM standards enforcement.

iii. Contributed to design execution from concept to construction, served as construction admin consultant for Apple's new "Observatory" building in Cupertino, CA, assisted with site documentation, engineering coordination, and sample logistics.

iv. Collaborated with interior design teams on facade designs for Google stores in Oakbrook, IL and Santa Monica, CA, delivering high-quality renderings, diagrams, and technical drawings for client presentations.

v. Mentored interns as a "buddy" in the annual internship program and developed presentation materials to effectively communicate designs to clients, fabricators, and contractors.

SKILLS

Robotics
ROS, PLC Programming (TwinCAT 3.0), COMPAS(FAB, RRC), ABB/KUKA/UR Robot Operation, Robotic Path Planning and Simulation, Robotic End Effector Design.

Programming
Python, C#, RhinoScript, Next.js

Software
Rhinoceros 3D, Grasshopper, Autodesk Fusion 360, Adobe Creative Suite, Autodesk Revit, MAYA, Rendering Softwares (Enscape, Keyshot, Vray)

Rapid Prototyping
3D Printing, 3-Axis CNC Machining, CNC Knitting, Waterjet Cutting, Zünd Cutting, Metalworking, Welding, Woodworking, Ceramics Fabrication.

SYMPOSIUM CONFERENCE

ACADIA 2020 | Workshop 03 ART: Augmented Robotic Telepresence
Led by Ebrahim Poustinchi, Online

Princeton Advanced Manufacturing Symposium
April 2024, Princeton, NJ

TALKS

Reviewer
San Jose State University DSIT 29 - Design Process Mid Review **2023.10**
Course Instructor: Jeremy Nguyen

Reviewer
San Jose State University Interior Design Final Review **2022.05**
Program Director: Prof. MeiZhen Seah

Panelist
AIA Talk: Women In The AEC Industry **2022.01**
Gensler, San Jose, CA