

Ruhan Yang

Assistant Professor

Game Design and Development
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RESEARCH SUMMARY

My research focuses on **playful and tangible computational systems** that expand access to learning and creative technology practice. I work at the intersection of human-computer interaction, game design, and physical computing. I build material-aware systems that turn abstract computation into embodied, hands-on experiences. I develop serious games, paper robots, and tangible interfaces that make circuits and logic visible and manipulable. The goal is to lower barriers to computational literacy and foster broader participation in STEM through accessible and playful systems.

Research Areas:

- ✧ Tangible and Embodied Interaction
- ✧ Computational Making and Fabrication
- ✧ Serious Games
- ✧ Physical Computing
- ✧ STEM Education and Broadening Participation

ACADEMIC APPOINTMENTS

Assistant Professor, University of Colorado Colorado Springs

Spring 2026 - Present

EDUCATION

University of Colorado Boulder

- ◆ **Doctor of Philosophy**, Creative Technologies and Design Aug 2021 - Dec 2025
Advisor: Prof. Ellen Yi-Luen Do
Dissertation: Techniques and Methods for Building Paper Modular Robots: *cubo* as an Integrated Example
- ◆ **Master of Science**, Creative Technologies and Design Aug 2019 - May 2021
- ◆ **Bachelor of Science**, Mechanical Engineering (major) Jan 2015 - May 2019
Applied Mathematics (minor)

PUBLICATION

1. **Ruhan Yang**, Yuchen Zhang, and Ellen Yi-Luen Do. 2026. **Lighting the Reef: Modular Paper Circuits as Ecological Metaphor**. In Twentieth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '26), March 08–11, 2026, Chicago, IL, USA. ACM, New York, NY, USA, 9 pages.
<https://doi.org/10.1145/3731459.3779321>
2. **Ruhan Yang** and Ellen Yi-Luen Do. 2025. **Connect! A Circuit-Driven Card Game**. In Designing Interactive Systems Conference (DIS '25), July 5–9, 2025, Funchal, Portugal. ACM, New York, NY, USA, 5 pages.
<https://doi.org/10.1145/3715668.3736371>

3. **Ruhan Yang** and Ellen Yi-Luen Do. 2025. **Exploring Circuit Education for Early Learners**. American Society for Engineering Education Rocky Mountain Section Conference (ASEE RMS 2025), May 14-16, 2025, Boulder, Colorado, USA. <https://doi.org/10.18260/1-2-1146-55216>
4. **Ruhan Yang** and Ellen Yi-Luen Do. 2024. **Fabricating Haptic Paper Interface**. In Special Interest Group on Computer Graphics and Interactive Techniques Conference Posters (SIGGRAPH'24), July 27 - August 01, 2024. ACM, New York, NY, USA. <https://doi.org/10.1145/3641234.3671052>
5. **Ruhan Yang** and Ellen Yi-Luen Do. 2024. **Empowering Non-Technical Users: Building Paper Circuit Boards with Zone-Based Circuit Stickers**. In Special Interest Group on Computer Graphics and Interactive Techniques Conference Labs (SIGGRAPH'24), July 27–August 01, 2024, Denver, CO, USA. ACM, New York, NY, USA. <https://doi.org/10.1145/3641236.3664425>
6. **Ruhan Yang** and Ellen Yi-Luen Do. 2024. **Building Locker Mini-Worlds: A CAD Course with a Semester-Long Project**. American Society for Engineering Education Rocky Mountain Section Conference (ASEE RMS 2024), May 15-17, 2024, Boulder, Colorado, USA. <https://doi.org/10.18260/1-2-1113-49423>
7. **Ruhan Yang** and Ellen Yi-Luen Do. 2024. **Let's Build a Traffic Light: Teaching Physical Computing to Children with EdBoard**. In Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 2 (SIGCSE 2024), March 20–23, 2024, Portland, OR, USA. ACM, New York, NY, USA. <https://doi.org/10.1145/3626253.3635425>
8. **Ruhan Yang** and Ellen Yi-Luen Do. 2024. **PaBo Bot: Paper Box Robots for Everyone**. In Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction (HRI '24). Association for Computing Machinery, New York, NY, USA, 1158–1162. <https://doi.org/10.1145/3610978.3640696>
9. **Ruhan Yang**. 2024. **Paper Modular Robot: Circuit, Sensation Feedback, and 3D Geometry**. In International Conference on Tangible, Embedded, and Embodied Interaction (TEI'24), February 11–14, 2024, Cork, Ireland. ACM, New York, NY, USA. <https://doi.org/10.1145/3623509.3634899>
10. **Ruhan Yang** and Ellen Yi-Luen Do. 2023. **Enhancing Accessibility in Soft Robotics: Exploring Magnet-Embedded Paper-Based Interactions**, ACM DIS 2023 Workshop 02: Soft Robotics and Programmable Materials for Human-Computer Interaction <https://arxiv.org/abs/2404.07360>
11. **Ruhan Yang**, Krithik Ranjan, and Ellen Yi-Luen Do. 2023. **Fabricating Paper Circuits with Subtractive Processing**, ACM CHI 2023 Workshop 02: Beyond Prototyping Boards: Future Paradigms for Electronics Toolkits <https://arxiv.org/abs/2404.07364>
12. Peter Gyory, S. Sandra Bae, **Ruhan Yang**, Ellen Yi-Luen Do, and Clement Zheng. 2023. **Marking Material Interactions with Computer Vision**. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23), April 23–28, 2023, Hamburg, Germany. ACM, New York, NY, USA. <https://doi.org/10.1145/3544548.3580643>
13. S. Sandra Bae, Rishi Vanukuru, **Ruhan Yang**, Peter Gyory, Ran Zhou, Ellen Yi-Luen Do, and Danielle Albers Szafir. 2023. **Cultivating Visualization Literacy for Children Through Curiosity and Play**, in IEEE Transactions on Visualization and Computer Graphics, vol. 29, no. 1, pp. 257-267. [doi:10.1109/TVCG.2022.3209442](https://doi.org/10.1109/TVCG.2022.3209442)
14. Sandra Bae, **Ruhan Yang**, Peter Gyory, Julia Uhr, Danielle Albers Szafir, and Ellen Yi-Luen Do. 2021. **Touching Information with DIY Paper Charts & AR Markers**. In Interaction Design and Children (IDC '21). Association for Computing Machinery, New York, NY, USA. <https://dl.acm.org/doi/10.1145/3459990.3465191>
15. **Ruhan Yang**, Cody Candler, and Ellen Yi-Luen Do. 2020. **EdBoard: An Educational Breadboard**. In Proceedings of the 2020 ACM Interaction Design and Children Conference: Extended Abstracts (IDC '20). Association for Computing Machinery, New York, NY, USA. <https://dl.acm.org/doi/10.1145/3397617.3397832>

AWARDS AND HONORS

- ◆ Center for Humanities & the Arts (CHA) Graduate Summer Fellowship, CU Boulder 2025
- ◆ Summer Graduate School Fellowship, CU Boulder 2024
- ◆ Distinguished Graduate Student Award, ATLAS Institute, CU Boulder 2021
- ◆ ATLAS Institute Scholarship, CU Boulder 2019 - 2021
- ◆ Summer Session Incentive Award, College of Engineering, CU Boulder 2016

TECHNICAL SKILLS

Design Tools: SOLIDWORKS, Autodesk Fusion 360, CorelDRAW, Microsoft Office Suite

Programming: R, Python, Processing, P5.js, MATLAB

Fabrication: Laser Cutting, 3D Printing, Vinyl Cutter, Lathe, Mill

SERVICE AND LEADERSHIP

Conference Program Chair, ACM/IEEE International Conference on Human-Robot Interaction 2024

Responsible for the Student Design Challenge, organized and scheduled events as the local chair.

Conference Reviewing

ACM Conference on Human Factors in Computing Systems (CHI) 2023 - 2026

ACM SIGCHI Conference on Designing Interactive Systems (DIS) 2023 - 2026

ACM International Conference on Tangible, Embedded and Embodied Interaction (TEI) 2023 - 2026

ACM Interaction Design and Children (IDC) 2023 - 2025

ACM Special Interest Group on Computer Science Education Technical Symposium (SIGCSE) 2024

ACM/IEEE International Conference on Human-Robot Interaction (HRI) 2024

ASEE Rocky Mountain Section Regional Conference 2024 - 2025

ACM International Conference on Tangible, Embedded and Embodied Interaction (TEI) 2023 - 2025

TEACHING EXPERIENCE

My teaching philosophy centers on fostering creativity, critical thinking, and hands-on learning to empower students to explore and innovate within a supportive, interdisciplinary environment.

Graduate Part-Time Instructor, ATLS 3100 FORM, CU Boulder Fall 2022

Designed and delivered a 16-week undergraduate course focusing on CAD and 3D fabrication.

Introduced the "Locker Mini-Worlds" project to integrate critical thinking and technical skills.

Presented teaching outcomes at the ASEE Rocky Mountain Section Conference (2024).

Teaching Assistant, ATLS 3100 FORM, CU Boulder Fall 2021

Supported students in learning CAD software and 3D fabrication methods.

Lecturer, Science Discovery, CU Boulder Summer 2022 - 2025

Developed and led hands-on courses introducing engineering to K-12 students.

Designed age-appropriate learning experiences based on tangible interaction and play.

GUEST LECTURES AND TALKS

- ◆ *cubo: Paper Modular Robot You Can Build at Home*, Three Minute Thesis, CU Boulder 2024
- ◆ *Building Circuits with Circuit Sticks*, Junkyard Social Club Museum 2024
- ◆ *Inspiration From Traditional Chinese Crafts*, ATLAS Colloquium, CU Boulder 2023
- ◆ *From Paper Planes to Paper Robots*, Sketching in Hardware Summit 2023

MENTORSHIP EXPERIENCE

Mentor , CU Science Discovery STEM Research Experience, CU Boulder	2025
Support high school students through hands-on research projects.	
Mentor , Graduate Peer Mentoring Program, Graduate School, CU Boulder	2022 - 2025
Supported graduate students in navigating academic, professional, and personal challenges.	
Graduate Student Mentor, Student PI , ATLAS Institute, CU Boulder	2021 - 2024
Supported graduate students in research projects and creative design activities.	
Student PI , CU Summer Program for Undergraduate Research (CU SPUR) Program, CU Boulder	2024
Lead summer research programs and mentor undergraduate students in STEM research and projects.	
Student PI , Summer Multicultural Access to Research Training (SMART) Program, CU Boulder	2023 - 2024
Mentored students from underrepresented backgrounds in research methods and professional development.	
Graduate Mentor , YOU'RE@CU Research Program, CU Boulder	2022
Provided research instruction to undergraduate students, introducing them to the fundamentals of research.	
Tutor, Instructional Assistant , Student Academic Success Center, CU Boulder	2017 - 2019
Supported first-generation and underrepresented students and helping develop study strategies.	

MENTORED STUDENTS

Name	Degree	Program	Year
Maeve Gillies	Colorado Academy, Denver, Colorado	CU Science Discovery	2025
Evan Brown	Heritage High School, Littleton, Colorado	CU Science Discovery	2025
Shraddha Shinde	M.S. in Creative, Tech. & Design, CU Boulder	Graduate Peer Mentoring Program	2024 - 2025
Eli Skelly	M.S. in Creative, Tech. & Design, CU Boulder	Graduate Peer Mentoring Program	2024 - 2025
Xin Wen	Ph.D. in Creative, Tech. & Design, CU Boulder	Graduate Peer Mentoring Program	2023 - 2024
Jyothish Gompa	M.S. in Creative, Tech. & Design, CU Boulder	Graduate Peer Mentoring Program	2022 - 2023
Deanna Gelosi	Ph.D. in Creative, Tech. & Design, CU Boulder	Graduate Peer Mentoring Program	2022 - 2023
Mallory Hutton	M.S. in Mechanical Engineering, CU Boulder	Graduate Peer Mentoring Program	2021 - 2022
Harshal Upare	M.S. in Mechanical Engineering, CU Boulder	Graduate Peer Mentoring Program	2021 - 2022
Isaac Lammers	M.S. in Aerospace Engineering, CU Boulder	Graduate Peer Mentoring Program	2020 - 2021
Ansley Andersen	A.S. in CS, Front Range Community College	CU SPUR Program	2024
Victor Purkiss	A.S. in ME, Front Range Community College	CU SPUR Program	2024
Rafael Sanchez	A.S. in Mechanical Engineering, Phoenix College	SMART Program	2024
Sergio Bustamante	M.S. in Electrical engineering, University of Florida	SMART Program	2023
Ashley Weaver	B.S. in Computer Science, CU Boulder	YOU'RE@CU Research Program	2022
Alexandra Charland	B.S. in Creative, Tech. & Design, CU Boulder	ATLAS Capstone Project	2022
Percy Suchanek	B.S. in Creative, Tech. & Design, CU Boulder	ATLAS Capstone Project	2022
Leslie Luk	M.S. in Creative, Tech. & Design, CU Boulder	ATLAS Capstone Project	2022
Shengyuehui Li	M.S. in Creative Computing, UAL (UK)	ATLAS Institute (Lab Research Intern)	2024 - 2025
Yilin Wang	M.S. in Art and Design, CUG (China)	ATLAS Institute (Lab Research Intern)	2024
Malcolm Smith	Niwot High School, Niwot, Colorado	ATLAS Institute (Lab Research Intern)	2024
Elise Johnson	B.S. in Mechanical Engineering, CU Boulder	ATLAS Institute (Lab Research Intern)	2022 - 2024
FNU Mansi	M.S. in Creative, Tech. & Design, CU Boulder	ATLAS Institute (Mentoring Program)	2021 - 2022
Shreyasi Mandal	M.S. in Creative, Tech. & Design, CU Boulder	ATLAS Institute (Mentoring Program)	2021 - 2022
Doran Harrop	B.A. in Education Studies, CU Boulder	Student Academic Success Center	2019
Janeth Garcia	B.A. in Math. and Economics, CU Boulder	Student Academic Success Center	2019

MENTORED STUDENTS (CONT.)

Name	Degree	Program	Year
Brad Fleming	B.A. in Media Studies, CU Boulder	Student Academic Success Center	2019
Yasmin Sid-ahmed	B.S. in Environmental Engineering, CU Boulder	Student Academic Success Center	2019
Dayse JaquezBojorquez	B.S. in Engineering and Eng. Technol., MSU Denver	Student Academic Success Center	2019
Jonathan Goins	B.A. in Computer Science, CU Boulder	Student Academic Success Center	2019
Esmeralda Gutierrezrivera	B.A. in Spanish for Professions, CU Boulder	Student Academic Success Center	2019
Abraham.Ogundare	B.A. in Computer Science, CU Boulder	Student Academic Success Center	2019
Christian Carrillo	B.S. in Accounting, Santa Monica College	Student Academic Success Center	2019
Andrea Gutierrez	B.A. in Ecol. and Evol. Biology, CU Boulder	Student Academic Success Center	2018 - 2019
Niko Suazo	CU Boulder student 2018 - 2020	Student Academic Success Center	2018
Lucy Opincariu	B.A. in Integrative Physiology, CU Boulder	Student Academic Success Center	2018
Mariana Avitia Cisneros	B.A. in Political Science, CU Boulder	Student Academic Success Center	2018
Lili Hailemariam	B.A. in Computer Science, CU Boulder	Student Academic Success Center	2018