Ruichen Liu

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Education

Boston University | Boston, MA — Starting Sep 2025
Ph.D. in Computer Science, advised by Prof. Emily Whiting at Shape Design & Computation Lab
Research Interests: Computational Fabrication, 3D Printing, Computer Graphics

Boston University | Boston, MA — Jan 2023 - May 2025
B.A. in Computer Science with Honors; Magna Cum Laude; GPA: 3.90; Dean's List
Coursework: Computational Fabrication, Computer Graphics, Linear Algebra

Purdue University | West Lafayette, IN — Aug 2021 - Dec 2022
B.S. in Computer Science (Transferred); GPA: 3.90; Dean's List & Semester Honors
Coursework: Game Development, OO-Programming, Discrete Mathematics

Purdue University | West Lafayette, IN — Aug 2021 - Dec 2022
B.A. in Sound Design (Transferred); GPA: 3.90; Dean's List & Semester Honors
Coursework: Music Theory and Composition, Sound Design, Jazz Improvisation

Research

Undergraduate Honors Thesis Advised by Prof. Emily Whiting — Sep 2024 - May 2025
Creating a Unique Solution for Computerized Titanium Anodization via Electrolysis — Boston, MA

- Developing a pipeline to print color images on titanium using electrolysis
- Creating an algorithm to map colors to corresponding voltages, using K-means clustering to process images
- Modifying existing 3D printer to control the electrolysis tool head
- Implementing pointillism and optical mixing technique to create stylized fabricated images

Experiences

Desktop Software Engineer Intern | C++, Research, SLA, SLS — May 2025 - Aug 2025
Formlabs — Somerville, MA

- Design and implement software features for PreForm and Formlabs printers
- Optimize the efficiency and accuracy of the slicing algorithm for SLS printers

Graphics Algorithms Engineer Intern | C++, Research, Tool Path Planning — May 2024 - Aug 2024
Bambu Lab — Shanghai, China

- Designed path planning graphics algorithms for new flagship multi-tool head 3D printer
- Designed and implemented Gcode generation for new tool head, laser, vinyl cut, and draw pen functionalities
- Independently developed an algorithm for dynamically adjusting tool path planning in vinyl cutting, ensuring precision with passive knives
- Investigated and drafted technical solution for backend pipeline of draw pen and laser engrave on curved surfaces
- Contributed more than 1,000 lines of C++; improved vinyl cut and draw pen precision from 10mm to 2mm
- Wrote 10+ technical documentation about 3D printer tool head path planning algorithm design and experiment records, with a total of 20k+ words, helped coworkers to understand backend algorithms

Gaming Market and Player Experience Researcher | Research, Report, Data Processing — Nov 2022 - Apr 2023
Tencent Games — Remote

- Wrote 13 reports analyzing player behavior and statistics across rhythm games, FPS, racing games, and casual games, totaling over 80,000 words
- Engaged in monthly team research projects, presented findings to mentors and core members via online presentation, received positive feedback from mentors for the superior data analytical skill
- Wrote an article analyzing social media behavior trends among Chinese youth, selected as the best article of the month by mentors, released on Tencent's news platform, which got 2000+ views

Teaching

Grader for CS 581 Computational Fabrication | 3D Printing, Laser Engraving — Jan 2025 - May 2025
Boston University — Boston, MA

- Supporting professor to manage a class of 30+ students, grading homework and exams
- Grading homeworks including voxilization and linkages
- Providing assistant in 3D printing for students' class research project

Teaching Assistant for CS 480 / 680 Intro to Computer Graphics | Python, OpenGL — Sep 2024 - Dec 2024
Boston University — Boston, MA

- Supporting professor to manage a class of 50+ students, writing assignment instructions, grading homework and exams
- Co-leading discussion sessions, 3 times a week, with a total of 50+ students, fostering collaborative problem-solving and deeper engagement with course material
- Conducting weekly 2-hour office hours and addressing student inquiries on Piazza, offering guidance and support for complex course concepts, such as quaternion, rendering, viewing pipeline etc.

Course Assistant for CS 237 Probability in Computing | Python, Jupyter Notebook — Sep 2023 - May 2024
Boston University — Boston, MA

- Conducted weekly office hours, co-led discussion sessions for 30 students, and addressed student inquiries on Piazza
- Graded assignments and exams, providing detailed feedback to improve student performance

Projects

Course Research Project — Feb 2024 - May 2024
Image Printing on Titanium using Laser Cutter — Boston, MA

- Led a class research group of 2 graduate students, to develop a method for printing color images on titanium using a laser cutter
- Designed and supervised experiments to determine optimal engraving parameters for accurate color reproduction on titanium; recorded and analyzed experiments data
- Designed and implemented a Python script to map color to engraving power and speed
- Improved color printing on titanium, demonstrated the possibility of gradient printing using laser, and presented findings at the end of the semester

Audio Programmer, Sound Designer | Unity 3D, C#, Wwise — May 2022 - Aug 2023
Indie Game: Stoneman's Adventure

- Developed audio for a Steam-released game using audio middleware Wwise
- Enhanced music interactivity through an algorithm for semi-random audio playback
- Sold over 200 units in the first month and received 3rd place in the CUSGA (China University Student Game Awards), the largest student game development competition in China

Honors & Awards

Academic Excellence Award in Computer Science Department, Boston University	May 2025
INDIE Live Expo 2023 Winter Official Selection	Dec 2023
NetEase Mini-Game Finalist	Nov 2023
3rd Place for the Ultimate Best Game Award, China University Student Game Awards	Aug 2022

Skills

Programming Languages: Python, C++, Java, C#, C, LaTeX
Fabrication: 3D Printing, Laser Engraving, Passive Knife Cutting
Game Development: Unity, Wwise, Game Sound Design, Blender
Technical Skills: NumPy, Jupyter Notebook, Git, Flask