

Ruichen Liu

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Education

Boston University Boston, MA Ph.D. in Computer Science advised by Prof. Emily Whiting Research Interests: Computational Fabrication, 3D Printing, Computer Graphics	Sep 2025 - Present
Boston University Boston, MA B.A. in Computer Science with Honors; Magna Cum Laude; GPA: 3.90; Dean's List Coursework: Computational Fabrication, Computer Graphics, Linear Algebra	Jan 2023 - May 2025
Purdue University West Lafayette, IN B.S. in Computer Science (Transferred); GPA: 3.90; Dean's List & Semester Honors Coursework: Game Development, OO-Programming, Discrete Mathematics	Aug 2021 - Dec 2022
Purdue University West Lafayette, IN B.A. in Sound Design (Transferred); GPA: 3.90; Dean's List & Semester Honors Coursework: Music Theory and Composition, Sound Design, Jazz Improvisation	Aug 2021 - Dec 2022

Research

Undergraduate Honors Thesis Advised by Prof. Emily Whiting Creating a Unique Solution for Computerized Titanium Anodization via Electrolysis - Developed a pipeline to print color images on titanium using electrolysis - Created an algorithm to map colors to corresponding voltages, using K-means clustering to process images - Modified existing 3D printer to control the electrolysis tool head - Accepted to present a demo at the Symposium on Computational Fabrication 2025	Sep 2024 - May 2025 Boston, MA
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Experiences

Desktop Software Engineer Intern C++, Research, SLA, SLS Formlabs - Developed new features for PreForm software and supported the development of upcoming Formlabs printers - Designed and implemented efficient auto-fill algorithms for SLA (Stereolithography), a long-requested feature now used by millions of PreForm users worldwide, achieving plate fills in under 10 seconds even for complex geometries - Researched, documented, and evaluated algorithms for the fill the build feature, collaborating with supervisors and colleagues to finalize the approach - Resolved a long-standing issue with Qt not bundling correctly for PreForm's Python binding on macOS - Refactored and improved X/Y scaling compensation settings for better user experience; reorganized printer task codebase to improve maintainability	May 2025 - Aug 2025 Somerville, MA
Graphics Algorithms Engineer Intern C++, Research, Tool Path Planning Bambu Lab - Developed path planning graphics algorithms for flagship multi-toolhead 3D printers H2D and H2S - 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	May 2024 - Aug 2024 Shanghai, China

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 voxelization 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

Audio Programmer, Technical Sound Designer | Wwise

April 2025 – Present

Indie Game: Echo of the Dust

- Developed immersive audio for an award-winning indie game using the Wwise middleware
- Enhanced music interactivity by implementing seamless transitions between segments (exploration, combat, boss fights) through Wwise RTPC (Real-Time Parameter Control)

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 immersive 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)

Honors & Awards

Ultimate Best Game Award, China University Student Game Awards	Aug 2025
Best Audio Award, China University Student Game Awards	Aug 2025
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