Ruanqianqian (Lisa) Huang

Contact Information

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Research Interests

Human-computer interaction, user experience in programming, computing education, programming tools for developers and non-experts, end-user programming

Education

University of California, San Diego, La Jolla, CA, USA

Ph.D. in Computer Science — Aug. 2020 - Jun. 2026 (exp.)

- Thesis: *Human-Centered Programming Assistants (tentative)*
- Committee: Sorin Lerner (Chair), Michael Coblenz, Philip J. Guo, and James D. Hollan

M.S. in Computer Science — Aug. 2020 - Dec. 2022

Wellesley College, Wellesley, MA, USA — Aug. 2016 - May 2020

B.A. (summa cum laude) in Computer Science (Honors) and Cognitive & Linguistic Sciences

- Thesis: *The Design and Implementation of Venbrace, A Text Language for App Inventor*
- Advisor: Professor Franklyn Turbak

Honors and Awards

Special Recognitions for Outstanding Reviews, UIST 2025	2025
UCSD CSE Award for Excellence in Teaching (awarded to 1 PhD student)	2024
2024 Summer Graduate Teaching Scholars, UC San Diego	2023
Special Recognitions for Outstanding Reviews, CHI 2024	2023
PLMW Scholarship, Symposium on Principles of Programming Languages (POPL)	2021
Trustee Scholar (1 of 4 out of 600+ graduates), Wellesley College	2020
Academic Achievement Award, Wellesley College (awarded to 1 graduating CS major)	2020
Sigma Xi Honors Research Society, Wellesley College	2020
Jerome A. Schiff Fellowship for Thesis Research, Wellesley College	2019
Phi Beta Kappa Honor Society (elected as a junior), Wellesley College	2019
Science Center Research Award, Wellesley College	2018
Sandra Wieland Howe Scholarship for Music Performance, Wellesley College	2017

Research Experience

University of California San Diego — La Jolla, CA

Graduate Student Researcher (*Supervisor: Prof. Sorin Lerner*) — Aug. 2020 - Present

- Leading the user evaluation of multi-modal plotting support in computational notebooks.
- Identified scientists' notebook challenges via field observations to inform a new tool.
- Translated contextual inquiry insights into a human-centered GUI debugging tool.
- Designed and evaluated a tool to help developers more effectively validate AI-generated code.
- Revealed a programming tool's benefits for learning through a mixed-methods field study.

Project Lead & UX Researcher, LLM-Powered Assistants for Education — Aug. 2023 - Present

- Designed the initial AI tutor prototype, identifying key improvements through pilot testing.
- Directed a large-scale deployment, analyzing surveys and usage logs to inform product roadmap.
- Leading a cross-functional team, translating research into education-serving products. [coverage]

Apple Inc. Pittsburgh, PA

HCI Research Intern, AI/ML (*Supervisor: Dr. Mary Beth Kery*) Apr. 2023 - Sep. 2023

- Led needfinding interviews and field observations on the workflows of machine learning novices.
- Developed interactive prototypes to simplify model building for non-expert users.

Microsoft Research Redmond, WA

Research Intern, RiSE (*Supervisor: Dr. Nikolaj Bjørner*) Jun. 2022 - Sep. 2022

- Created design guidelines for logic modeling tools via participatory design with educators.
- Developed Z3Guide, a web-based learning environment for the Z3 theorem prover.
- Validated Z3Guide's benefits for learning experience through an online workshop (N=112).

Publications & Preprints

Conference Papers

[C.5] Ilana Shapiro, **Ruanqianqian (Lisa) Huang**, Zachary Novack, Cheng-i Wang, Hao-Wen Dong, Taylor Berg-Kirkpatrick, Shlomo Dubnov, and Sorin Lerner. Deriving Representative Structure from Music Corpora. arXiv preprint arXiv:2502.15849. To appear in *the 34th International Joint Conferences on Artificial Intelligence (IJCAI '25)*, Montreal, Canada, 2025.

[C.4] **Ruanqianqian (Lisa) Huang**, Savitha Ravi, Michael He, Boyu Tian, Sorin Lerner, and Michael Coblenz. How Scientists Use Jupyter Notebooks: Goals, Quality Attributes, and Opportunities. In *Proceedings of the IEEE/ACM 47th International Conference on Software Engineering (ICSE '25)*, Ottawa, Canada, 2025.

[C.3] **Ruanqianqian (Lisa) Huang**, Philip J. Guo, and Sorin Lerner. Unfold: Enabling Live Programming for Debugging GUI Applications. In *2024 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)*, Liverpool, UK, 2024.

[C.2] **Ruanqianqian (Lisa) Huang**[†], Kasra Ferdowsi[†], Michael B. James, Nadia Polikarpova, and Sorin Lerner. 2024. Validating AI-Generated Code with Live Programming. In *Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '24)*, May 11–16, 2024, Honolulu, HI, USA. ACM, New York, NY, USA, 8 pages. ([†]Equal contribution)

[C.1] **Ruanqianqian (Lisa) Huang**, Kasra Ferdowsi, Ana Selvaraj, Adalbert Gerald Soosai Raj, and Sorin Lerner. Investigating the Impact of Using a Live Programming Environment in a CS1 Course. In *Proceedings of the 53rd ACM Technical Symposium on Computer Science Education V. 1 (SIGCSE '22)*. Providence, RI, March 2022.

Workshop and Poster Papers

[S.3] **Ruanqianqian (Lisa) Huang**, Philip J. Guo, and Sorin Lerner. Unfolding State Changes via Live State-First Debugging. In *the Ninth Workshop on Live Programming (LIVE 2023)*. Cascais, Portugal, October 2023.

[S.2] **Ruanqianqian (Lisa) Huang**, Elizaveta Pertseva, Michael Coblenz, and Sorin Lerner. How do Haskell programmers debug?. In *the 13th annual workshop on the intersection of HCI and PL (PLATEAU '23)*. Pittsburgh, PA, February 2023.

[S.1] **Ruanqianqian Huang** and Franklyn Turbak. A Design for Bidirectional Conversion between Blocks and Text for App Inventor. In *2019 IEEE Blocks and Beyond Workshop (B&B)*, Memphis, TN, October 2019.

Technical Reports

[R.1] **Ruanqianqian (Lisa) Huang**, Ayana Monroe, Peli de Halleux, Sorin Lerner, and Nikolaj Bjørner. Z3Guide: A Scalable, Student-Centered, and Extensible Educational Environment for Logic Modeling. Microsoft Research Technical Report MSR-TR-2025-36. 2025.

Preprints

[P.2] **Ruanqianqian (Lisa) Huang**, Brian Hempel, Yining Cao, Haijun Xia, and Sorin Lerner. Always-Presentable Computational Notebooks. Under review (title anonymized). 2025.

[P.1] Brian Hempel, **Ruanqianqian (Lisa) Huang**, Devamardeep Hayatpur, Sorin Lerner, and Haijun Xia. Multi-Modal Plot Authoring. Under review (title anonymized). 2025.

Invited Talks

[T.7] "How Scientists Use Jupyter Notebooks: Goals, Quality Attributes, and Opportunities". *SoCal PLS*, Feb. 2025.

[T.6] Invited panelist at PLMW@SPLASH 2024 (Ph.D. student mentoring event), Oct 2024.

[T.5] "User-Enhanced Learning Experience of Symbolic Logic Solving". *Women in Compilers and Tools Meetup Series, LLVM Organization.*

[T.4] "Impact of Live Programming on Student Learning in a CS1 Course". *Computing Education Research Seminar, UC Davis*, Nov. 2022.

[T.3] "The Design and Implementation of Venbrace, A Text Language for App Inventor". *App Inventor Team, Massachusetts Institute of Technology*, May 2020.

[T.2] "Bidirectional Conversion between Blocks and Text for App Inventor". *Blocks and Beyond Workshop*, Oct. 2019; *MIT App Inventor Summit*, Aug. 2019.

[T.1] "Interactive Visualizations and Credibility Evaluations of News Stories on TwitterTrails". *Wellesley College Summer Research Summit*, Aug. 2018.

Teaching Experience

9 academic terms of teaching and mentoring undergrad and grad students at UCSD and Wellesley in courses spanning across various domains of Computer Science.

University of California, San Diego

- **Instructor**, CSE 12 - Basic Data Structures and Object-Oriented Design (N=45) — Summer 2024
- **Instructor**, CSE 193 - Intro to CS Research (N=53) — Fall 2023
- **Teaching Assistant**, CSE 8A - Intro to Programming in Python (N=495) — Fall 2024
- **Teaching Assistant**, CSE 291 - LLMs, Programming, and HCI (N=34) — Spring 2024
- **Teaching Assistant**, CSE 8A - Intro to Programming in Python (N=601) — Fall 2022
- **Teaching Assistant**, CSE 230 - Graduate Programming Languages (N=200+) — Fall 2021
- **Mentor TA**, CSE 599 - Teaching Methods in Computer Science (N=45) — Spring 2025
- **Training in Student-Centered College Teaching & Course Design**, UCSD Teaching and Learning Commons — Winter 2024

Wellesley College

- **Tutor**, CS 251 - Principles of Programming Languages — Fall 2019
- **Tutor**, CS 230 - Data Structures — Spring & Fall 2018

Girls Who Code

- Club Facilitator and Teaching Assistant, Intro to Web Programming — Fall 2017

Mentorship Experience

As a graduate student at UCSD, I directly supervised **8 undergraduate and graduate research assistants** as follows:

- Arpita Pandey (UCSD undergrad), on Information Foraging in Jupyter Notebooks — 2025 -
- Kaleigh Beachler (UCSD undergrad), on AI Tutor for Programming Education; winner of UCSD Triton Research & Experiential Learning Scholars (TRELS) for summer 2024 (20% acceptance rate) — 2024 -
- Michael He (UCSD undergrad), on Jupyter Notebook Use in Scientific Computing [Pu.7] — 2024
- Boyu Tian (UCSD undergrad), on Jupyter Notebook Use in Scientific Computing [Pu.7] — 2024
- Justin Yao Du (UCSD undergrad; now Databricks), on Live Programming for Unit Testing; selected for presentation in 2022 PLDI Student Research Competition — 2021 - 2022

- Mandeep Syal (UCSD undergrad; now Lumenci), on Live Programming for Unit Testing; selected for presentation in 2022 PLDI Student Research Competition — 2021 - 2022
- Thanh-Nha Tran (UCSD undergrad; now MS student at UCSD), on Live Programming for Unit Testing; selected for presentation in 2022 PLDI Student Research Competition — 2021 - 2022
- Ilana Shapiro (UCSD PhD student), on Symbolic Music Analysis [Pu.8] — 2023 - 2025

In Fall 2023, I further advised **53 undergraduate ERSP participants (15 research projects across various domains of Computer Science)** as their instructor for "Intro to CS Research".

Service

External Service

Program Committee: LIVE Workshop (2024, 2025), SIGCSE TS (2024, 2025)

Artifact Evaluation Committee: <Programming> (2024)

Reviewer: TOCE (2023), CHI (2022, 2024, 2025), UIST (2023, 2025)

Student Volunteer: POPL (2023)

Internal Service

Mentor, UCSD Graduate Women in Computing	2024 -
Co-President, UCSD Graduate Women in Computing	2023 - 2024
Mentorship Program Coordinator, UCSD Graduate Women in Computing	2022 - 2023
UCSD CSE Ph.D. Admissions Committee	2021 - 2023
Application Reviewer, UCSD CSE Early Research Scholars Program	2022
Executive Board, Wellesley College Chamber Music Society	2017 - 2020
Volunteer, Harvard PBHA Chinatown Teen	2016 - 2017

Other Employment

Apple Inc. — Cupertino, CA
Data Analysis Intern, Cloud Infrastructure — Summer 2019

- Forecast future fleet changes to optimize hardware resource allocation with 88.38% accuracy.
- Automated a recurring manual report for Finance by improving the API for search queries.

Avatar Works — Xiamen, China
Software Engineering Intern, Natural Language Processing — Summer 2017

- Assisted with chatbot development by analyzing Chinese textual data using NLTK.

Skills

Research • Contextual Inquiry • Field Observation • Grounded Theory • Interview • Survey • Software Usability Testing • Thematic Analysis • Content Analysis • Statistical Analysis

Programming • TypeScript • JavaScript • HTML/CSS • Python • Node.js • React • LaTeX• Java • R • Haskell • GitHub & Git • CI/CD

Tools • MAXQDA • Qualtrics • Figma • Sketch • Adobe Premiere Pro • Adobe Photoshop

Domain Knowledge • Program Analysis • Domain-Specific Languages • Time Series Forecasting

References

Sorin Lerner (Thesis Advisor)
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