

# Angel (Leyi) Cui

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## Education

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- Carnegie Mellon University** Aug 2025 - Present  
*PhD, School of Computer Science; Advisor: Prof. Rohan Padhye* GPA: 4.0
- Columbia University**  
*MS in Computer Science (Columbia Engineering)* Sep 2024 - May 2025  
*BA in Computer Science, Minor in Dance (Barnard College)* Sep 2020 - Feb 2024
- Dean's List; Graduated with **Computer Science Departmental Honors**
  - Relevant Courses: Formal Verification, Programming Languages, Code Generation, Program Synthesis. AI

## Selected Publications

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### Peer Reviewed

- Fuzzy Mental Model: A Formalism for Reasoning About Confusion in Human Technology Interaction**  
 Matthew L. Bolton, *Leyi Cui*, Eunsuk Kang  
*International Journal of Human-Computer Interaction*
- Constrained LTL Specification Learning from Examples**  
 Chengjian Zhang, Parv Kapoor, Ian Dardik, *Leyi Cui*, Romulo Meira-Goes, David Garlan, Eunsuk Kang  
*ICSE 2025* [DOI](#) [↗](#)
- CWEval: Outcome-driven Evaluation on Functionality and Security of LLM Code Generation**  
 Jinjun Peng, *Leyi Cui*, Kele Huang, Junfeng Yang, Baishakhi Ray  
*LLM4Code 2025* [DOI](#) [↗](#)
- A Formal Approach to the Analysis of Human-Machine Interaction with Fuzzy Logic**  
*Leyi Cui*  
*SPLASH 2024: Student Research Competition* [DOI](#) [↗](#)
- Interactively Assisting Glaucoma Diagnosis with an Expert Knowledge-distilled Vision Transformer**  
 Ziheng 'Leo' Li, Haowen 'John' Wei, Kuang Sun, *Leyi Cui*, David Li, Steven K. Feiner, Kaveri A. Thakoor  
*CHI Late Break Work 2025* [DOI](#) [↗](#)
- Towards Reactive Synthesis as a Programming Paradigm**  
*Leyi Cui*, Raven Rothkopf, Mark Santolucito  
*PLATEAU 2024* [DOI](#) [↗](#)
- Towards the Usability of Reactive Synthesis: Building Blocks of Temporal Logic**  
 Raven Rothkopf, *Angel Leyi Cui*, Hannah Tongxin Zeng, Arya Sinha, Mark Santolucito  
*PLATEAU 2023* [DOI](#) [↗](#)

### Manuscripts Under Review

- DateSAT: A Framework for Solving Date and Period Constraints**  
*Leyi Cui*, Shrey Tiwari, Rohan Padhye
- Chronically Buggy: Analyzing Date/Time Pitfalls In Open-Source and LLM-Generated Python Code**  
 Shrey Tiwari, Serena Chen, Alexander Joukov, Peter Vandervelde, *Leyi Cui*, Ao Li, Rohan Padhye
- NeuroMigrate: Machine Learning Based Run-time Validation as a Safety Net for System Migrations**  
*Leyi Cui*, Elifia Muthia, Seth Pullman, Baishakhi Ray, Mark Santolucito
- Combining LLM Code Generation with Formal Specifications and Reactive Program Synthesis**  
 William Murphy, Nikolaus Holzer, Feitong Qiao, *Leyi Cui*, Raven Rothkopf, Nathan Koenig, Mark Santolucito  
[DOI](#) [↗](#)

## Research Experience

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- Amazon AWS - Automated Reasoning** Arlington, VA  
*Applied Scientist Intern* Jun 2025 - Aug 2025

- Designed and built CloudGym, an LLM-based cloud emulator for cloud testing at scale that finds realistic bugs, reduces hallucinations, and lowers input-token usage vs. an LLM baseline, while supporting more services than traditional emulators
- Constructed a benchmark of 67 real-world AWS SDK programs covering 29 services and an automated evaluation pipeline to compare LocalStack, an LLM-based baseline, and CloudGym

### ARiSE Lab, Columbia University

Research Assistant; Advisor: **Prof. Baishakhi Ray, Prof. Junfeng Yang**

New York, NY  
Sep 2024 – Feb 2025

### Software Design and Analysis Lab, CMU

Research Assistant; Advisor: **Prof. Eunsuk Kang, Prof. Matthew L. Bolton**

Pittsburgh, PA  
May 2023 – Feb 2025

### Barnard Programming Language Lab, Columbia University

Research Assistant, Advisor: **Prof. Mark Santolucito**

New York, NY  
May 2022 – Feb 2025

## Early Industry Experience

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**Apple**, *Apple Teacher for programming and music*

Jun 2021 – Aug 2021

- Taught 50+ kids computer programming and music in rural areas to promote education equality

**ByteDance**, *Game Producer and Planner*

Oct 2020 – May 2021

- Shipped Hui Su Sha Tang, a music game with 545k views, 41k downloads, and a rating of 8.1/10.0

## Service

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Program Committee: AAAI 2026

Artifact Evaluation Program Committee: TACAS 2025, iFM 2025, TACAS 2026, OOPSLA 2026

Student Volunteer: ICSE 2026

Admission Committee: CMU REUSE Summer Research Experience 2026

## Scholarships, Grants, Prizes, and Honors

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NSF and SIGSOFT CAPS travel grant for ICSE 2025

Columbia University, 2025 Andrew P. Kosoresow Memorial Award for **Excellence in Teaching and Service**

SPLASH 2024: Student Research Competition, **Graduate Student Second Place**

2023 Columbia University Undergraduate Computer and Data Science Research Fair **Best Overall Prize**

2023 CMU Research Experiences for Undergraduates in Software Engineering (REUSE) Program **Scholarship**

Fall 2023 Beyond Barnard Internship Program **Grant Recipient**

2022 Columbia University DevFest Hackathon **Best Design Prize**

2020 Byte Camp Game Design Track **Winner**

2019 CRC (FRC) Robotics Competition **National 2nd Place**

2018 MIT Energy Hackathon **Third Place, MIT Track Winner**

## Teachings and Mentorship

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**Mentor, CMU Paths to AI Research**, CMU

Fall 2025

**Mentor, Graduate Application Support Program**, CMU

Fall 2025

**Teaching Assistant, Computer Science Theory**, Columbia University

Fall 2022 - Spring 2025

Instructor: Tal Malkin, Xi Chen, Toniann Pitassi, Josh Alman; Students: 400+

**Mentor, Application Development Initiative**, Columbia University

Spring 2022, Spring 2025

**Mentor, Barnard Peer Mentoring Program**, Barnard College

2022 - 2024

## Skills

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**Formal Methods & Program Analysis:** SMT-Lib, Z3, Alloy, LTL, Symbolic Execution, Static/Dynamic Analysis, Formal Verification, Differential Testing, Fuzz Testing, Property-based Testing

**Artificial Intelligence:** LLMs, AI Agents, MCP