

# Justin Lubin

✉ [justin@jlubin.net](mailto:justin@jlubin.net)   [jlubin.net](https://jlubin.net)   [justinlubin](https://justinlubin.com)

Curriculum Vitae, June 2024

## Research Vision

I co-design programming systems with domain experts. These programming tools empower them to write the code they need with autonomy. Centrally, I develop programming language theory to make new user interactions possible in these systems. My programming language theory work is informed by what I learn from deeply embedding with domain experts and from my mixed-methods human-computer interaction research.

**Primary area:** Programming languages   **Secondary area:** Human-computer interaction

## Education

**University of California, Berkeley** 2020–  
PhD in Computer Science (*Major: Programming languages, Minor: Bioinformatics*)  
Advisor: Sarah E. Chasins

**University of Chicago** 2016–2020  
BS in Computer Science (Honors), BS in Mathematics, Minor in Music. *Summa cum laude*.  
Advisor: Ravi Chugh  
Honors Thesis: [Forging Smyth: The Impl. of Program Sketching with Live Bidirectional Evaluation](#)

## Research Internships

**Carnegie Mellon University** 2018  
Advisors: Jonathan Aldrich (CMU), Alex Potanin (Victoria University of Wellington)  
Project: [Approximating Polymorphic Effects with Capabilities](#)

## Peer-Reviewed Conference and Journal Publications

\* = equal contribution, † = research mentee

**[Equivalence by Canonicalization for Synthesis-Backed Refactoring](#)** PLDI 2024  
[Justin Lubin](#), Jeremy Ferguson<sup>\*†</sup>, Kevin Ye<sup>\*†</sup>, Jacob Yim<sup>\*†</sup>, and Sarah E. Chasins  
In *Proceedings of the ACM on Programming Languages (PACMPL)*, Issue PLDI.

**[Exploring the Learnability of Program Synthesizers by Novice Programmers](#)** UIST 2022  
Dhanya Jayagopal<sup>\*†</sup>, [Justin Lubin](#)<sup>\*</sup>, and Sarah E. Chasins  
In *Proceedings of the ACM Symposium on User Interface Software and Technology*.

**[How Statically-Typed Functional Programmers Write Code](#)** OOPSLA 2021  
[Justin Lubin](#) and Sarah E. Chasins  
In *Proceedings of the ACM on Programming Languages (PACMPL)*, Issue OOPSLA.

**[Program Sketching with Live Bidirectional Evaluation](#)** ICFP 2020  
[Justin Lubin](#), Nick Collins, Cyrus Omar, and Ravi Chugh  
In *Proceedings of the ACM on Programming Languages (PACMPL)*, Issue ICFP.

**Sketch-n-Sketch: Output-Directed Programming for SVG** UIST 2019  
Brian Hempel, [Justin Lubin](#), and Ravi Chugh  
In *Proceedings of the ACM Symposium on User Interface Software and Technology*.

**Deuce: A Lightweight User Interface for Structured Editing** ICSE 2018  
Brian Hempel, [Justin Lubin](#), Grace Lu, and Ravi Chugh  
In *Proceedings of the International Conference on Software Engineering*.

## Workshop Publications

*\* = equal contribution, † = research mentee*

**Searching for Incidental Specifications** PLATEAU 2023  
Jeremy Ferguson<sup>\*†</sup>, Kevin Ye<sup>\*†</sup>, Jacob Yim<sup>\*†</sup>, and [Justin Lubin](#)  
In *Proceedings of the Workshop on Evaluation and Usability of Programming Languages and Tools*.

**Type-Directed Program Transformations for the Working Functional Programmer** PLATEAU 2019  
[Justin Lubin](#) and Ravi Chugh  
In *Proceedings of the Workshop on Evaluation and Usability of Programming Languages and Tools*.

## Honors

**NSF Graduate Research Fellowship (GRFP)** 2020–2025

### Mentoring and Teaching Awards

Undergraduate Research Mentoring Award (UC Berkeley) 2023  
Outstanding Graduate Student Instructor Award (UC Berkeley) 2022

### Student Research Competitions

3<sup>rd</sup> Place Graduate at CHI, *How Statically-Typed Functional Programmers Author Code* 2021  
1<sup>st</sup> Place Undergraduate at SPLASH, *Approximating Polymorphic Effects with Capabilities* 2018

**Special Recognition for Outstanding Review** CHI 2023

### Honor Societies

Sigma Xi 2020–  
Phi Beta Kappa 2019–

### Academic Honors

Enrico Fermi Scholar (University of Chicago) 2020  
Harper Award (University of Chicago) 2020  
Student Marshal (University of Chicago) 2019–2020  
Dean's List (University of Chicago) 2016–2020

## Invited Talks and Other Presentations

### Invited External Talks

[UPenn PLClub](#) — How Statically-Typed Functional Programmers Write Code 2022  
[UCSD PL Seminar](#) — How Statically-Typed Functional Programmers Write Code 2021

### Invited Internal Talks and Workshops

Nuñez Lab — Wrangling Flow Cytometry Data	2024
Nuñez Lab — Vizualizing Data in Python with the Grammar of Graphics	2023
Nuñez Lab — Re-Imagining Programming for Experimental Biologists	2023
EPIC Retreat — Usable Programming Tools for Experimental Biologists	2023
Nuñez Lab — Analysis and Visualization of RNA-seq Data	2023
EPIC Advance — Exploring the Learnability of Program Synthesizers by Novice Programmers	2022

### Guest Lectures

CS 294: Building User-Centered Programming Tools — User-Centered Design	2023
CS 164: Programming Languages and Compilers — Compiler Optimizations	2021

## Professional Activities and External Service

### Dagstuhl Participation

Theories of Programming	2022
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### Organizing Committee

Workshop on Evaluation and Usability of Programming Languages and Tools	PLATEAU 2024
◦ Additional Responsibilities: Publicity Chair	
Workshop on Evaluation and Usability of Programming Languages and Tools	PLATEAU 2023

### Program Committee

Workshop on Human Aspects of Types and Reasoning Assistants	HATRA 2024
Workshop on Live Programming	LIVE 2024
Symposium on New Ideas in Programming and Reflections on Software	Onward! 2024
Workshop on Human Aspects of Types and Reasoning Assistants	HATRA 2023
Workshop on Live Programming	LIVE 2023

### External Reviewer

ACM Conference on Human Factors in Computing Systems	CHI 2023
◦ Received Special Recognition for Outstanding Review	
Formal Methods in System Design	FMSD 2022
ACM Symposium on User Interface Software and Technology	UIST 2021

### Social Sessions Co-organizer

PL+HCI “Swimmer” School	2022
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### Student Volunteer

Elm in the Spring Conference	2019
International Conference on Functional Programming (ICFP)	2018

## Mentorship

*UG = undergrad*

### MS Thesis Research Mentees (with Sarah E. Chasins)

Jacob Yim (UG, MS @ UC Berkeley → PhD @ UCSD)	2022–
◦ Co-authorship at PLDI 2024	
◦ Co-first authorship at PLATEAU 2023	

Jeremy Ferguson (UG, MS @ UC Berkeley) 2022–2024

- *MS Thesis: [Eliciting Domain Expertise Reduces Examples Needed for Program Synthesis](#)*
- Co-authorship at PLDI 2024
- 2<sup>nd</sup> place UG at POPL SRC 2023, *Synthesizing Vectorized Code via Verified Lifting*
- Co-first authorship at PLATEAU 2023

Dhanya Jayagopal (UG, MS @ UC Berkeley → Software engineer @ Udemy) 2020–2022

- *MS Thesis: [Study of Program Synthesizers & Novice Programmers](#)*
- Co-first authorship at UIST 2022

**Additional Research Mentees** (with Sarah E. Chasins)

Laila Walker (UG, Co-mentored with Jacob Yim) 2024–

Kevin Ye (UG, Gap-year researcher @ UC Berkeley) 2022–2024

- Co-authorship at PLDI 2024
- Co-first authorship at PLATEAU 2023

Fayaz Shaik (UG @ Ohlone College & [TTE REU](#) mentee → UG @ UCSD) 2021–2022

- Poster at SACNAS NDISTEM 2021, *User-Centered Data Population of Knowledge Graphs*

**[SIGPLAN-M](#) Mentees**

Carolina Carreira (PhD @ CMU Portugal) 2022–

Adharsh Kamath (Research Fellow @ MSR India → PhD @ UIUC) 2022–

**Additional Mentees**

Kasozi Vincent (MS @ University of Chlef) 2022–2023

## Teaching

**University of California, Berkeley**

[CS 164: Programming Languages and Compilers](#) (TA) Fall 2022

[CS 164: Programming Languages and Compilers](#) (Head TA) Fall 2021

- Received Outstanding Graduate Student Instructor Award

**University of Chicago**

[CMSC 22300: Functional Programming](#) (TA) Spring 2020

[CMSC 16100: Honors Introduction to Programming I](#) (Grader) Fall 2018

## Internal Service

**UC Berkeley [Programming Systems \(PS\)](#) Research Group and [EECS Department](#)**

Visit Days Peer Advisor 2021–2023

Visit Days PS Coordinator 2022

PS Seminar Organizer 2021–2022

PS Graduate Admissions Representative Winter 2021

## Leadership, Diversity, and Community Service

**[Berkeley Underground Scholars](#) — Graduate Tutor** 2023–

Tutoring formerly-incarcerated/systems-impacted students in computer science.

**[EECS Peers](#) — Co-organizer** 2023–

Co-leading a graduate student peer support and mentorship organization. (*Mentor since 2022.*)

- SIGPLAN-M Long-Term Mentorship Program — Mentor** 2022–  
Serving as a mentor for the SIGPLAN-M long-term programming languages mentorship program.
- Equal Access to Application Assistance Program — Reviewer** 2023  
Reviewed PhD applications as part of a student-run initiative aiming to ensure that all PhD applicants to UC Berkeley have access to guidance on the application process.
- Association of Women in EE&CS (AWE) — Grad School Advisor** 2023  
Hosted office hours to advise women and nonbinary undergraduates interested in graduate school.
- WiCSE Girl Scout Engineering Day — Activity Designer and Leader** 2023  
Designed and led educational activities for the Girl Scouts of Northern California to earn their programming and robotics badge.
- Women in Computer Science and Electrical Engineering (WiCSE) — Grad Mentor** 2022  
Served as a mentor for the WiCSE Grad Mentorship Program, where veteran PhD students get paired up with first- and second-year PhD students for general mentorship.
- #ShutdownPL — Co-organizer** 2020–2022  
Coordinated logistics and managed funding for three keynote speakers at dedicated anti-racist events at ICFP and POPL.
- Transfer-to-Excellence Summer Research Program (TTE REU) — Mentor** 2021  
Served as a research mentor the TTE REU, a research experience for community college students seeking to transfer to four-year universities.
- compileHer Tech Capstone — Activity Leader** 2019  
Led computer science educational activities for middle school girls in Chicago.