

# Justin Lubin

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Curriculum Vitae, June 2025

## Research Vision

**Mission:** *To enable scientists to write code with only domain expertise, not programming expertise.*

**I co-design programming systems with domain experts.** These systems empower them to write the code they need by themselves. To make new user interactions possible in these systems, I develop **programming language theory** informed by what I learn from **deeply embedding with domain experts**, as well as my qualitative and quantitative human-computer interaction research.

**Primary area:** Programming languages    **Secondary areas:** Human-computer interaction, biology

## Education

**University of California, Berkeley**

2020–

PhD in Computer Science

Advisor: Sarah E. Chasins

Major: Programming languages

Minor: Bioinformatics

**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

[Programming by Navigation](#)

PLDI 2025

[Justin Lubin](#), Parker Ziegler, and Sarah E. Chasins

To appear in *Proceedings of the ACM on Programming Languages (PACMPL)*, Issue PLDI.

[Fast Direct Manipulation Programming with Patch-Reconciliation Correspondence](#)

PLDI 2025

Parker Ziegler, [Justin Lubin](#), and Sarah E. Chasins

To appear in *Proceedings of the ACM on Programming Languages (PACMPL)*, Issue PLDI.

[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*.

## Public Drafts

<sup>\*</sup> = equal contribution, <sup>†</sup> = research mentee

### **Programmable epigenome editing by transient delivery of CRISPR epigenome editor ribonucleoproteins**

Da Xu<sup>\*</sup>, Swen Besselink<sup>\*</sup>, Gokul N. Ramadoss, Philip H. Dierks, [Justin P. Lubin](#), Rithu K. Pattali, Jinna I. Brim, Anna E. Christenson, Peter J. Colias, Izaiah J. Ornelas, Sarah E. Chasins, Bruce R. Conklin, and James K. Nuñez  
*Under review.*

## Workshop Publications

<sup>\*</sup> = equal contribution, <sup>†</sup> = 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, <i>How Statically-Typed Functional Programmers Author Code</i>	2021
1 <sup>st</sup> Place Undergraduate at SPLASH, <i>Approximating Polymorphic Effects with Capabilities</i>	2018

### Special Recognition for Outstanding Review

CHI 2023, UIST 2025 (×2)

### 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

UCSD PL/HCI Graduate Seminar (Philip Guo) — Q&A on Exploring the Learnability of Program Synthesizers by Novice Programmers	2025
<a href="#">UCSC Languages, Systems, and Data Seminar</a> — Programming By Navigation	2024
<a href="#">UPenn PLClub</a> — How Statically-Typed Functional Programmers Write Code	2022
<a href="#">UCSD PL Seminar</a> — How Statically-Typed Functional Programmers Write Code	2021

### Invited Internal Talks and Workshops

<a href="#">Nuñez Lab</a> — From .FASTQs to .SVGs: How to make a bioinformatics pipeline	2025
<a href="#">EPIC Retreat</a> — Unblocking Scientists with Programming by Navigation	2025
<a href="#">Nuñez Lab</a> — Participatory Design and Programming Systems	2024
<a href="#">Nuñez Lab</a> — Wrangling Flow Cytometry Data	2024
<a href="#">Nuñez Lab</a> — Vizualizing Data in Python with the Grammar of Graphics	2023
<a href="#">Nuñez Lab</a> — Re-Imagining Programming for Experimental Biologists	2023
<a href="#">EPIC Retreat</a> — Usable Programming Tools for Experimental Biologists	2023
<a href="#">Nuñez Lab</a> — Analysis and Visualization of RNA-seq Data	2023
<a href="#">EPIC Advance</a> — Exploring the Learnability of Program Synthesizers by Novice Programmers	2022

### Guest Lectures

<a href="#">UC Berkeley CS 294: Building User-Centered Programming Tools</a> — User-Centered Design	2023
<a href="#">UC Berkeley CS 164: Programming Languages and Compilers</a> — Compiler Optimizations	2021

## Professional Activities and External Service

### Dagstuhl Participation

<a href="#">Theories of Programming</a>	2022
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### Organizing Committee

Workshop on Evaluation and Usability of Programming Languages and Tools	PLATEAU 2025
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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 2025
Workshop on Live Programming	LIVE 2025
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 (Papers Track)	Onward! 2024
Workshop on Human Aspects of Types and Reasoning Assistants	HATRA 2023
Workshop on Live Programming	LIVE 2023

### Reviewer

ACM Symposium on User Interface Software and Technology	UIST 2025
◦ Received Special Recognition for Outstanding Review (×2)	
ACM Conference on Human Factors in Computing Systems	CHI 2025
Journal of Functional Programming	JFP 2024
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)	2022–2025
◦ <i>MS Thesis</i> : <a href="#">Translations Alone Do Not Help Programmers Work With Unfamiliar Abstractions</a>	
◦ Co-authorship at PLDI 2024	
◦ Co-first authorship at PLATEAU 2023	
Jeremy Ferguson (UG, MS @ UC Berkeley → Software Engineer @ Voleon)	2022–2024
◦ <i>MS Thesis</i> : <a href="#">Eliciting Domain Expertise Reduces Examples Needed for Program Synthesis</a>	
◦ Co-authorship at PLDI 2024	
◦ 2 <sup>nd</sup> place UG at POPL SRC 2023, <i>Synthesizing Vectorized Code via Verified Lifting</i>	
◦ Co-first authorship at PLATEAU 2023	
Dhanya Jayagopal (UG, MS @ UC Berkeley → Software Engineer @ Udemy)	2020–2022
◦ <i>MS Thesis</i> : <a href="#">Study of Program Synthesizers &amp; Novice Programmers</a>	
◦ Co-first authorship at UIST 2022	

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

Laila Walker (UG @ UC Berkeley → PhD @ UW, Co-mentored with Jacob Yim)	2024–2025
Kevin Ye (UG, Gap-year Researcher @ UC Berkeley → MS @ Simon Fraser University)	2022–2024
◦ Co-authorship at PLDI 2024	
◦ Co-first authorship at PLATEAU 2023	
Fayaz Shaik (UG @ Ohlone College & <a href="#">TTE REU</a> Mentee → UG @ UCSD)	2021–2022
◦ Poster at SACNAS NDiSTEM 2021, <i>User-Centered Data Population of Knowledge Graphs</i>	

### **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
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## **Teaching**

### **University of California, Berkeley**

<a href="#">CS 164: Programming Languages and Compilers</a> (TA)	Fall 2022
<a href="#">CS 164: Programming Languages and Compilers</a> (Head TA)	Fall 2021
◦ Received Outstanding Graduate Student Instructor Award	

### **University of Chicago**

<a href="#">CMSC 22300: Functional Programming</a> (TA)	Spring 2020
<a href="#">CMSC 16100: Honors Introduction to Programming I</a> (Grader)	Fall 2018

## **Internal Service**

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

EECS Faculty Hiring Committee, Student Member	2025
EECS Visit Days Peer Advisor	2021–2023, 2025
PS Visit Days Coordinator	2022
PS Seminar Organizer	2021–2022
PS Graduate Admissions Representative	2021

## **Leadership, Diversity, and Community Service**

<a href="#">Incarceration to College Program</a> — Tutor	2025–
Tutoring incarcerated youth in mathematics to promote success in post-secondary education.	

<a href="#">Berkeley Underground Scholars</a> — Graduate Tutor	2023–
Tutoring formerly-incarcerated/systems-impacted students in computer science and mathematics.	

<a href="#">EECS Peers</a> — Co-organizer	2023–
Co-leading a graduate student peer support and mentorship organization. ( <i>Mentor since 2022.</i> )	

<a href="#">SIGPLAN-M Long-Term Mentorship Program</a> — Mentor	2022–
Serving as a mentor for the SIGPLAN-M long-term programming languages mentorship program.	

- Equal Access to Application Assistance Program — Reviewer** 2023–2024  
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 series of office hours to advise women and nonbinary undergraduates interested in grad 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  
Cooordinated 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 for 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.