# Justin Lubin

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Curriculum Vitae, July 2019

## Research Interests

My goal is twofold: to develop *elegant theories* and to make them usable by *humans*. To that end, I am interested in *programming language theory* and draw great inspiration from the study of *human-computer interaction*.

## Education

2016–2020 (expected) **University of Chicago**, Chicago, IL
*B.S., Computer Science, Mathematics (Minor in Music)*
GPA: 3.96/4.00

## Research Experience

2016–present **Research Assistant**
*University of Chicago*, Chicago, IL
Advisor: Ravi Chugh

2018 **Research Assistant**
*Carnegie Mellon University*, Pittsburgh, PA
Advisors: Jonathan Aldrich (CMU), Alex Potanin (Victoria University of Wellington)

## Other Experience

2018 **Grader**
*University of Chicago*, Chicago, IL
CMSC 16100: Honors Introduction to Programming I

## Research Projects

2016–present **Sketch-n-Sketch**
*University of Chicago*, Chicago, IL (with Ravi Chugh)

Sketch-n-Sketch is a bidirectional HTML and SVG editor. Users can write and evaluate programs to produce output, as usual, but they can also directly manipulate the *output* of a program to change the program itself. Two important goals of this project are (i) to provide an environment that makes it easier for users to develop complex and reusable content, and (ii) to develop theoretical machinery necessary for more general-purpose output-directed manipulation and bidirectional editing.

2017–present **Deuce**
*University of Chicago*, Chicago, IL (with Ravi Chugh)

Deuce is a structure-aware code editor equipped with direct manipulation capabilities for invoking automated program transformations. Deuce's aim is to provide human-friendly structural interactions on top of familiar text-based editing.

2018 **Wyvern**
*Carnegie Mellon University*, Pittsburgh, PA (with Jonathan Aldrich and Alex Potanin)

Wyvern is an object-oriented, capability-safe language focused on security, modularity, and language extensibility. Specifically, I have done work on Wyvern's capability-based effect system by developing theory (and implementing it in the compiler) to make it more usable for programmers.

## Publications

Brian Hempel, Justin Lubin, and Ravi Chugh. **Semi-Automated SVG Programming via Direct Manipulation: Interacting with Intermediates.** In *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST)*, New Orleans, LA, October 2019. Conditionally accepted to appear.

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

## Workshop Papers

2019 **Type-Directed Program Transformations for the Working Functional Programmer**
*PLATEAU 2019*, New Orleans, LA

## Presentations

2018 **Approximating Polymorphic Effects with Capabilities**
*SPLASH 2018 Student Research Competition*, Boston, MA

2018 **Direct Manipulation Programming in Sketch-n-Sketch**
*ICFP 2018 Tutorial*, St. Louis, MO
Presented with Ravi Chugh, Nick Collins, Brian Hempel, and Mikaël Mayer

## Posters

2018 **Approximating Polymorphic Effects with Capabilities**
*Midwest Programming Languages Summit 2018*, Madison, WI

## Honors

2019 **Student Marshal**, University of Chicago

*Student Marshals are appointed by the President of the University; appointment as a Student Marshal is among the highest honors conferred by the University upon undergraduate students.*

— Office of the Marshal, University of Chicago

2019 **Phi Beta Kappa Honor Society**, University of Chicago
Inducted in third year of undergraduate studies.

2018 **First place (undergraduate)**, SPLASH 2018 Student Research Competition
Awarded for *Approximating Polymorphic Effects with Capabilities*.

2016–2019 **Dean's list**, University of Chicago

## Community and Professional Service

2019 **Volunteer Instructor**
compileHer Tech Capstone

*Our annual Tech Capstone introduces middle school girls from all across the city of Chicago to computer science topics in a fun and interactive way.*

— compileHer, Student Organization at the University of Chicago

2019 **Student Volunteer**
*Elm in the Spring*, Chicago, IL

2018 **Student Volunteer**
*ICFP 2018*, St. Louis, MO

## Other Activities

2019 **Oregon Programming Languages Summer School**
*Foundations of Probabilistic Programming and Security*