

Will Crichton

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Abstract

I apply insights from cognitive science to understand how people program, and to make programming tools easier to learn, use, and debug. I research questions like: What are [cognitive design principles](#) for programming tools? How do you teach someone to [think mathematically](#) about programming? What are the most useful applications of [program synthesis](#)? And why have we learned so little about the psychology of programming in the last 50 years?

Education

- 2016-now **Stanford University**, Ph.D. in Computer Science.
Advised by Pat Hanrahan
- 2012-16 **Carnegie Mellon University**, B.S. in Computer Science, minor in Chinese Studies.
Advised by Kayvon Fatahalian

Research

- 2020-21  **The Role of Working Memory in Program Tracing.**
[Will Crichton](#), Maneesh Agrawala, Pat Hanrahan. CHI 2021.
- 2019-21  **Automating Program Structure Classification.**
[Will Crichton](#), Georgia Gabriela Sampaio, Pat Hanrahan. SIGCSE 2021.
- 2020  **The Usability of Ownership.**
[Will Crichton](#). HATRA @ SPLASH 2020.
- 2020  **Documentation Generation as Information Visualization.**
[Will Crichton](#). PLATEAU @ SPLASH 2020.
- 2017-20  **Analyzing Who and What Appears in a Decade of US Cable TV News.**
James Hong, [Will Crichton](#), Haotian Zhang, Daniel Y. Fu, Jacob Ritchie, Jeremy Barenholtz, Ben Hannel, Xinwei Yao, Michaela Murray, Geraldine Moriba, Maneesh Agrawala, Kayvon Fatahalian. arXiv 2020.
- 2019  **Human-Centric Program Synthesis.**
[Will Crichton](#). PLATEAU @ UIST 2019.
- 2018-19  **Rekall: Specifying Video Events using Compositions of Spatiotemporal Labels.**
Daniel Y. Fu, [Will Crichton](#), James Hong, Xinwei Yao, Haotian Zhang, Anh Truong, Avanika Narayan, Maneesh Agrawala, Christopher Ré, and Kayvon Fatahalian. AI Systems @ SOSP 2019.
- 2017-19  **From Theory to Systems: A Grounded Approach to Programming Language Education.**
[Will Crichton](#). SNAPL 2019.
- 2018  **Identifying Barriers to Adoption for Rust through Online Discourse.**
Anna Zeng, [Will Crichton](#). PLATEAU @ SPLASH 2018.
- 2016-19  **Scanner: Efficient Video Analysis at Scale.**
Fait Poms, [Will Crichton](#), Pat Hanrahan, and Kayvon Fatahalian. SIGGRAPH 2018.
- 2015  **Lantern: A Query Language for Visual Concept Retrieval.**
Senior thesis, advised by Kayvon Fatahalian.

Awards

- 2017-19 **Magic Grant** from the Brown Institute for Media Innovation for the [Esper project](#) (awarded twice).
- 2015 **Alumni Award for Undergraduate Excellence** for senior thesis at CMU.

Teaching

- fall 2017-19 **Programming Languages** ([CS 242](#)). Instructor, Stanford.
- spring 2017 **Computer Systems from the Ground Up** ([CS 107e](#)). TA, Stanford.
- fall 2015 **Compiler Design** ([15-411](#)). TA, CMU.
- spring 2015 **Parallel Computer Architecture and Programming** ([15-418](#)). TA, CMU.
- 2014 **Parallel and Sequential Data Structures and Algorithms** ([15-210](#)). TA, CMU.
- fall 2013-14 **Game Development on the Web** (1-unit mini course). Instructor, CMU.
- fall 2013 **Functional Programming** ([15-150](#)). TA, CMU.

Work

- summer 2017 **Snap, Inc.** Research intern. Designed elastic video analytics system on Kubernetes, reducing operational costs up to $10\times$.
- summer 2015 **Jane Street Capital**. Software engineering intern. Optimized memory allocation in OCaml language runtime. Designed new parallelization strategy for incremental computation library.
- 2015 **Exp.ii**. Web developer. Architected web front-end for education startup.
- summer 2014 **Palantir Technologies**. Software engineering intern. Developed business logic engine for case management system.
- summer 2013 **Tunessence**. Web developer. Built interactive guitar tab learning tool for guitar learning startup.
- summer 2012 **Pioneer Hi-Bred**. Software engineer. Built BI app for analysis of laboratory efficiency in Pioneer labs.
- 2010-12 **Webspec Design**. Web developer. Created 30+ websites for clients across the country.