Will Crichton

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Abstract

I apply insights from cognitive psychology and programming language theory to understand how people program, and to better design tools for programmers. My current focus is using static analysis, such as types and information flow, to build tools for program comprehension, such as IDE plugins and documentation generators.

Education

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

Research

CONFERENCE PUBLICATIONS

2020-22	**Modular Information Flow through Ownership**. Will Crichton, Marco Patrignani, Maneesh Agrawala, Pat Hanrahan. PLDI 2022.
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.
2017-21	**Analysis of Faces 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. KDD 2021.
2016-19	**Scanner: Efficient Video Analysis at Scale**. Fait Poms, Will Crichton, Pat Hanrahan, and Kayvon Fatahalian. SIGGRAPH 2018.

WORKSHOP PUBLICATIONS

2021	**A New Medium for Communicating Research on Programming Languages.** Will Crichton. HATRA @ SPLASH 2021.
2020	**The Usability of Ownership**. Will Crichton. HATRA @ SPLASH 2020.
2020	**Documentation Generation as Information Visualization**. Will Crichton. PLATEAU @ SPLASH 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.

OTHER PUBLICATIONS

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   **Expii**. 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.

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