Will Crichton

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Links: Website, GitHub, Mastodon, Twitter

Education

2016-22 **Stanford University**, Ph.D. in Computer Science.
Advised by Pat Hanrahan and Maneesh Agrawala.

2012-16 **Carnegie Mellon University**, B.S. in Computer Science.
Advised by Kayvon Fatahalian.

Academic Employment

2025- **Brown University**, Assistant professor of Computer Science.

2022-2025 **Brown University**, Postdoctoral researcher in Computer Science.
Advised by Shriram Krishnamurthi.

Research

Conference publications

OOPSLA '24 **Profiling Programming Language Learning.**
Will Crichton, Shriram Krishnamurthi.
Distinguished Paper.

POPL '24 **A Core Calculus for Documents.**
Will Crichton, Shriram Krishnamurthi.

OOPSLA '23 **A Grounded Conceptual Model for Ownership Types in Rust.**
Will Crichton, Gavin Gray, Shriram Krishnamurthi.

PLDI '22 **Modular Information Flow through Ownership**.
Will Crichton, Marco Patrignani, Maneesh Agrawala, Pat Hanrahan.

CHI '21 **The Role of Working Memory in Program Tracing**.
Will Crichton, Maneesh Agrawala, Pat Hanrahan.
Featured in the MIT Programming Languages Review.

SIGCSE '21 **Automating Program Structure Classification**.
Will Crichton, Georgia Gabriela Sampaio, Pat Hanrahan.

KDD '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.

SIGGRAPH '18 **Scanner: Efficient Video Analysis at Scale**.
Fait Poms, Will Crichton, Pat Hanrahan, and Kayvon Fatahalian.

Legend:
= paper
= talk recording
= GitHub repo
= project website

Workshop publications

FUNARCH '23
Typed Design Patterns for the Functional Era.
Will Crichton.

HATRA '21
A New Medium for Communicating Research on Programming Languages.
Will Crichton.

HATRA '20
The Usability of Ownership.
Will Crichton.

PLATEAU '20
Documentation Generation as Information Visualization.
Will Crichton.

AI Systems @ SOSP '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.

SNAPL '19
From Theory to Systems: A Grounded Approach to Programming Language Education.
Will Crichton.

PLATEAU'18
Identifying Barriers to Adoption for Rust through Online Discourse.
Anna Zeng, Will Crichton.

Theses

2022
Revisiting Program Slicing with Ownership-based Information Flow.
Ph.D. thesis at Stanford.

2016
Lantern: A Query Language for Visual Concept Retrieval.
Bachelor's thesis at CMU.
Received Alumni Award for Undergraduate Excellence.

Invited Talks

2024
The Performance Engineer's Toolkit.
Presented at P99 Conf.

2024
Building a Human-Centered Science of Programming.
- Pomona College CS Colloquium
- Boston University POPV Seminar

2023
The Art and Science of Teaching Rust.
Presented at RustConf.

2022-23
Cognitive Design Principles for Programming Tools.
- MIT HCI Seminar
- Northeastern PL Seminar
- Tufts PL Seminar
- Georgia Tech PL/SE Seminar
- Barnard CS Seminar

2022-23
Modular Information Flow through Ownership.
- UC Santa Cruz LSD Seminar
- Amazon Web Services
- Rust Formal Methods Interest Group

2022
The Design of Nota.
Guest lecture for Jeff Heer's course at UW CSE 599D: "The Future of Scholarly Communication".

2021 **Type-Driven API Design in Rust.**
Presented at Strange Loop.

2019 **Video Analysis at Scale in the Era of Deep Learning.**
Presented at the Monterey Bay Aquarium Research Institute Research Seminar.

2018 **Data Mining 70,000 Hours of TV News.**
Presented at the "Audiovisual Collections" conference at the National Library of Sweden.

Teaching

Instructor

fall 2017-19 **Programming Languages** (CS 242). Stanford (3x).

fall 2013-14 **Game Development on the Web** (1-unit mini course). CMU (2x).

Teaching Assistant

spring 2017 **Computer Systems from the Ground Up** (CS 107e). Stanford.

fall 2015 **Compiler Design** (15-411). CMU.

spring 2015 **Parallel Computer Architecture and Programming** (15-418). CMU.

fall 2014 **Parallel and Sequential Data Structures and Algorithms** (15-210). CMU (Head TA).

spring 2014 **Parallel and Sequential Data Structures and Algorithms** (15-210). CMU.

fall 2013 **Functional Programming** (15-150). CMU.

Funding

2024-25 **DARPA grant #HR00112420354**, "Transitioning Rust Users at Scale with Tutoring" (TRUST), for several Rust-related education and usability projects.

2023 **NSF grant #2227863** under Formal Methods in the Field Track II for the Rust Book Experiment.

2022 **Amazon Web Services research gift** for the Rust Book Experiment.

2018 **Magic Grant** from the David and Helen Gurley Brown Institute for the TV News project.

2017 **Magic Grant** from the David and Helen Gurley Brown Institute for the Esper project.

Professional Service

Academic Community Service

PC = Program Committee, **OC** = Organizing Committee, **ERC** = Extended Review Committee

2025 **PC:** PLDI

2024 **PC:** Onward!, **OC:** HATRA, **ERC:** OOPSLA, **Reviewer:** CHI, UIST

2023 **OC:** HATRA, **ERC:** OOPSLA, **Reviewer:** CHI, UIST

2022 **PC:** HATRA, **Reviewer:** CHI, UIST

2021 **PC:** HATRA, **Reviewer:** SIGGRAPH, SIGGRAPH Asia

2020 **Reviewer:** UIST

2019 **Reviewer:** SIGGRAPH Asia

University Service

2024-25 **exploreCSR Mentor**
Participated as a mentor in Brown's exploreCSR program, helping undergraduate students from diverse backgrounds get into CS systems research.

2016-22 **Ph.D. Admit Weekend Organizer**
Ran events, comms, Q&A panels, and social activities for admitted students.
Awarded the Stanford CS Department Student Service Award all six years for volunteering in this role.

2019 **Undergraduate Summer Research Program Organizer**
Managed the CURIS program by running weekly events and facilitating student/faculty relations.

Industry Employment

summer 2017 **Snap, Inc.** Research intern. Designed an elastic and fault-tolerant distributed system for video analytics using Kubernetes, reducing operational costs up to $10\times$.

summer 2015 **Jane Street Capital**. Software intern. Reduced GC overhead in OCaml language runtime. Designed new parallelization strategy for incremental computation library.

2015 **Expii**. Web developer. Architected web front-end for education startup, managed hiring pipeline for new developers.

summer 2014 **Palantir Technologies**. Software intern. Developed 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 agricultural technology labs.

2010-12 **Webspec Design**. Web developer. Created 30+ websites for clients across the country.

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