

Will Crichton

Email: wrichto@cs.stanford.edu

GitHub: [willcrichton](https://github.com/willcrichton)

Abstract

I create systems that merge research in parallel computing and programming language design to solve impactful problems. Currently, I'm focusing on tools to enable large-scale visual data analysis.

Education

- 2016-now STANFORD UNIVERSITY, Ph.D. in Computer Science.
Advisor: Pat Hanrahan
- 2012-16 CARNEGIE MELLON UNIVERSITY, B.S. in Computer Science, minor in Chinese Studies.
Advisor: Kayvon Fatahalian

Research

- 2017 ESPER: QUERY, ANALYSIS, AND VISUALIZATION OF LARGE VIDEO COLLECTIONS. [GitHub link](#).
Research in progress on large-scale video analysis. See GitHub page for more information.
- 2016 SCANNER: EFFICIENT VIDEO ANALYSIS AT SCALE. [GitHub link](#).
Alex Poms, [Will Crichton](#), Pat Hanrahan, and Kayvon Fatahalian, pending submission to SIGGRAPH
Created Scanner, a platform for productively and efficiently extracting features from videos using heterogeneous hardware and cluster-scale computing. Implemented applications including cinematography analysis, markerless 3D reconstruction, and large-scale video data mining.
- 2015 LANTERN: A QUERY LANGUAGE FOR VISUAL CONCEPT RETRIEVAL. [Paper link](#).
Senior thesis, advised by Kayvon Fatahalian
Explored a language and runtime for modeling and extracting *visual concepts*, e.g. “person riding a bike” or “a busy intersection”, within images and videos. Developed a prototype system and evaluated effectiveness against applications in mining large visual datasets.

Work

- 2017 SNAP, INC. Research intern, architected elastic video analytics system, reducing operational costs up to 10x.
- 2015 JANE STREET CAPITAL. Software engineering intern, optimized memory allocations in OCaml language runtime, built distributed incremental computation library.
- 2015 EXP. II. Web developer, architected web front-end for education startup.
- 2014 PALANTIR TECHNOLOGIES. Software engineering intern, lead development of business logic engine for criminal case management system.
- 2013 TUNESSENCE. Web developer, build interactive guitar tab learning tool for guitar learning startup.
- 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.

Teaching

- fall 2017 STANFORD. Instructor, Programming Languages ([CS 242](#)).
- spring 2017 STANFORD. TA, Computer Systems from the Ground Up ([CS 107e](#)).
- fall 2015 CMU. TA, Compiler Design ([15-411](#)).
- spring 2015 CMU. TA, Parallel Computer Architecture and Programming ([15-418](#)).

- 2014 CMU. TA, Parallel and Sequential Data Structures and Algorithms (15-210).
- 2013-14 CMU. Instructor, Game Development on the Web (mini student-taught course).
- fall 2013 CMU. TA, Functional Programming (15-150).

Projects

- fall 2015 CMU. Efficient Object Proposals
Graduate Computer Vision (16-720) final project. Studied object proposal systems and discovered novel parallelism in the Edge Boxes algorithm, achieving 2x speedup over state-of-the-art.
- fall 2014 CMU. Cobalt Compiler
Compiler Design (15-411) final project. Created a compiler in Rust for a safe subset of C targeting x86 assembly and LLVM.
- spring 2013 CMU. [Terracuda](#)
Parallel Computer Architecture and Programming (15-418) final project. Created a Lua-like DSL for GPU programming on a high-level with near-CUDA efficiency.

Activities

- 2013-15 CMU. Algorithms with a Purpose
Founded CMU's first student-run coding competition. Ran tournament annually for 10+ universities and 150+ students from around the country.
- winter 2014 USA. Chinese Bridge (汉语桥)
Won national Chinese language and culture competition for language learners with performance of traditional Chinese fast storytelling.
- 2012-16 CMU. Parliamentary debate
Founded and led Carnegie Mellon's parliamentary debate team for four years.
- 2007-now Eagle Scout