Will Crichton

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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-present	STANFORD UNIVERSITY, Ph.D. in Computer Science. Advisor: Pat Hanrahan
2012-2016	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	EXPII. 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.
2010-2012	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).
2013-2014	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

2013-2015	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 traditonal Chinese fast storytelling.
2012-2016	CMU. Parliamentary debate Founded and led Carnegie Mellon's parliamentary debate team for four years.
2007-present	Eagle Scout