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Jasper Tran O'Leary

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EDUCATION

Ph.D.	Computer Science and Engineering	University of Washington	Sep 2017 – Jun 2024
M.S.	Computer Science and Engineering	University of Washington	Sep 2017 – Jan 2021
B.A.	Computer Science	University of California, Berkeley	Jan 2013 – Dec 2016

GPA: 3.88 (Ph.D./M.S.), 3.34 (B.A.). Selected coursework: algorithms, data structures, networks, operating systems, artificial intelligence, machine learning, graphics, PL/DSL design, compilers, embedded systems.

SKILLS

Languages: Python, Javascript/Typescript, Java, C, C++, SQL, HTML/CSS, WebAssembly.

Frameworks & Libraries: React, Apollo GraphQL, Three.js, WebGL, Node.js, Express.js, PyTorch, Numpy, Scipy, OpenCV, Microcontrollers (Arduino, Micropython).

Tools & Methodologies: Git/CI/CD, KVM/QEMU, Docker, Bazel, MongoDB, CAD/CAM, user testing, Chrome/Firefox Developer Tools, Test Automation (Jest, JUnit), Notebooks (Jupyter, Observable).

EMPLOYMENT

University of Washington — Graduate Student Researcher — Sep 2017 – Jun 2024

- Engineered 4 interactive software systems (see **Projects**) to help users of digital fabrication tools (e.g., 3D printing, laser cutting, lab automation robotics); published 11 publications in CS research journals.
- Owned all 4 systems as lead developer and pushed the systems to production for user testing.

Freelance — Software Engineer — May 2021 – Sep 2021

- Refactored a static PDF book catalog with a custom-built searchable library of book curricula.
- Leveraged vanilla Javascript and metaprogramming to implement dynamic functionality within existing Squarespace infrastructure without access to a backend.
- Work done for Hope in a Box, a non-profit for LGBTQ+ inclusive book curricula in public schools.
- Leveraged knowledge in Javascript, Google Sheets API, Git, and Github Actions.

Adobe — Research Engineer Intern — Feb 2017 – Sep 2017

- Prototyped a web-based UI design application that featured within-canvas graphical version control.
- Demonstrated in an experiment that use of the prototype correlated with increased confidence and recall in discussing previous design decisions compared to a baseline UI design tool.
- Published results in a CS journal (`doi:10.1145/3173574.3174109`) and as a patent (`US10896161B2`).
- Leveraged knowledge in Javascript, Meteor.js, and Git.

PROJECTS

Personal Website: `jasperoleary.com` (for additional information, projects, and publications)

Library for Fabrication Machine Control within Computation Notebooks ("Tandem")

- Developed an open source library to enable computational notebook to replicate experimental two-sided CNC milling, milled 4 example objects as a proof-of-concept.
- Built multiple web backends: a Python add-in for Autodesk Fusion 360, a reactive web page rendering AR visualizations via a JSON grammar, and a server for CNC instruction parsing and dispatch.
- Technologies used: Typescript, Python, Node.js, Websockets, HTTP API design, CNC milling.

Web Application and Domain-Specific Language for Fabrication Machines ("Taxon")

- Built a full-stack web application that for representing digital fabrication machines as programs.
- Formalized a domain specific language and compiler for moving between programs and simulations.
- Technologies used: Javascript, Node.js, Three.js, Express.js, and MongoDB.

Browser-Based Programming Environment for Machine Control and Visualization ("Verso")

- Implemented a web-based code editor for direct machine control and visualization leveraging React and automatic code generation for custom within-code UIs.
- Leveraged language interpreter techniques for machine-specific visualizations with Three.js and OpenCV.
- Technologies used: Typescript, Node.js, React, Three.js, SQL, HTTP API design, and OpenCV.