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## Experience

### **Patreon** Staff Software Engineer, *Creator Tools*

March 2023 –  
current

- In 2023, Patreon had a major push for two new features: one-time sales and free membership. I supported free membership.
- To allow free members to participate in creator communities, we needed to build automatic moderation of free member comments. This required a cross-functional, cross-team effort between our Trust and Safety, Machine Learning, and Product teams. To facilitate this coordination, I worked with other senior engineers to turn requirements into a design doc, helped describe the product-level behaviors for moderated comments and the high level architectural choices.
- Coordinated implementation effort by identifying the ownership of various parts of the system between multiple teams, and then led implementation of the product-side work—providing information to our ML systems and handling the product-side use of the results.
- These systems have run at low latency (p95 300ms) and high availability (>99.99%) since launch

### **Airtable** Staff Software Engineer, *Core Product*

July 2018 –  
December 2022

- Product focus, with an eye for holistic details of how the components of a product fit together in context. Worked on the full stack, contributing consistently to both frontend and backend.
- Led the creation of the initial version of the Gantt view.
- Proposed and implemented conditional form fields and conditional relational columns, including a key refactor to decouple filtering functionality from views.
- Ran the Core Product and Frontend orientation presentation to help new technical hires get up to speed with Airtable's architecture
- In a team of 3 of Airtable's most senior engineers, built the initial version of Sync. Contributed to backend architecture, overall feature roadmap, and implemented the majority of the frontend.
- Extended sync to multi-source capabilities and designed a framework for other engineers to introduce other sync sources. Listed as inventor on Airtable's first software patent, U.S. Patent 11475046.
- Led implementation effort for nested filters, one of Airtable's most requested features.
- Set strategic direction, roadmap, and frontend concepts for a whole-base dependency graph and worked with another engineer to outline an implementation path. Implemented various components of the backend and frontend directly and communicated handoff to other teams to get cross-organizational buy-in. This data structure now powers various components, including the base relationship map and the field management pane.

### **Thumbtack** Senior Software Engineer

November 2017 –  
June 2018

- Backend-focused engineer, primarily focused on performance, latency, and overall architecture improvements as Thumbtack migrated away from a monolith codebase.
- Built a React server-side rendering service to improve perceptual rendering times.
- Helped implement a graph-like storage layer on top of Postgres to help support scaling up Thumbtack's architecture.

### **Karmic Labs** Senior Software Engineer

February 2016 –  
October 2017

- Karmic was a small startup that built a product called Dash, which was a corporate expense card with instant purchase tracking and expense management.
- Built out various pieces of necessary infrastructure as the product gained traction.
- Implemented the beginning of an API for third-parties to interact with the product through OAuth2
- Built out API features as necessary to support third-party applications such as expense reporting and integrations with accounting software
- Took on a full-stack role to build out the internal customer support site using React with a Python backend.

## Dropbox **Software Engineer**, *Developer Platform Team*

June 2012 –  
January 2016

- Worked on a full stack team of 10 people, building backend code and services, front-end UIs, and distributing SDKs.
- Proposed, designed and implemented webhooks, a way for server-side apps to get low-latency notifications about file changes in Dropbox. Integrated with existing APIs to guarantee at-least-once delivery. Still in use as of 2024.
- Implemented a new endpoint for API clients to use for longpolling to receive real-time updates to file changes. Listed as inventor on U.S. Patent 9300492.
- Improved message throughput of the file notification service by 30%, and reimplemented several features to work asynchronously to remove latency spikes. Improved 95th-percentile latency by 5%.

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## Education

### Carnegie Mellon University

May 2012

**Bachelor of Science in Computer Science**, *Graduated with University Honors*  
Pittsburgh, PA

Teaching Assistant for 15-410 Operating Systems (S'11, F'12, S'12), and 14-411 Compiler Design (F'12).

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## Internships

Mozilla, 2011

**Software Engineering Intern**, *IonMonkey (JIT) Team*

Amazon, 2010

**Software Engineering Intern**, *Amazon Web Services*

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## Personal Projects

### **Fibration**, *LED art*

Inspired by mathematics and geometry, worked with another artist to build an LED art piece containing 2,500 LEDs in interlinked Villarceau circles describing the shape of a torus. Built sophisticated parametric CAD drawings, specced and sourced materials and hardware, designed custom fabrication fixtures, planned power system and created patterns using custom software (Chlorophyll)

### **Chlorophyll**, *Photon synthesis*

Chlorophyll is a tool for photon synthesis. It provides a visual programming environment and pre-visualizing tools for programming LED art. The user composes oscillators together to create a pattern which get compiled to a GL shader run on every pixel in the sculpture. Chlorophyll has been successfully used to render hundreds of thousands of pixels at 60fps for large scale art. Written in TypeScript using WebGL and Electron.

### **SMP4**, *Pebbles kernel extension*

Designed an assignment for 15-410 (Operating Systems) in which students extended their kernel projects with symmetric multiprocessing capabilities. Implemented SMP base code, helped design and implement reference SMP kernel, and wrote detailed plan-of-attack, assignment handout, project specification, and grading criteria.

### **Range Analysis for Mozilla IonMonkey**, *Compiler Design*

Worked with a partner to create a value range analysis pass for IonMonkey, Mozilla's JIT compiler. Used a novel approach to take advantage of IonMonkey's SSA form. Value range analysis is a dataflow pass which proves that integer variables cannot overflow and uses this information for optimizations.

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## Areas of Expertise

Languages

TypeScript, JavaScript, Python, Swift, C++, C, some experience with Go, and a passing knowledge of Haskell and SML

Software

Git, AWS, MySQL, Postgres, Redis, Memcached, Fusion360, Figma

Frameworks

React, Vue, Electron, Flask, Tornado, SQLAlchemy