

» employment

- May 2018 to Aug. 2018 **polycom | plantronics** Westminster, CO
Software Engineering Intern
Rebuilt major parts of the customer-facing Cloud Administration Portal and related APIs for service providers to manage device deployments, scale cloud services, diagnose device errors and review device analytics. Also reimplemented 2 other portals to be a part of the Cloud Administration Portal to make it easier for customers to manage their different deployments all in one place. Personally redesigned the architecture of the application, overcoming major design flaws, to be much more scalable, faster to iterate on, better for developer productivity and much more testable without throwing away most of the previous work. Used previous experience to act as a leader for my fellow interns on my project and brought them up to speed, making myself and the whole project much faster to iterate on. Used GitLab CI and GitLab to implement a CI Pipeline and move from a dirty trunk model to a master is production model with merge/pull requests and branches being used for feature development. Followed Agile Methodologies using GitLab and JIRA. Conducted meetings with and helped direct another development team in China.
- Sept. 2017 to Dec. 2017 **university of colorado - boulder** Department of Computer Science
Computer Systems Course Assistant
Computer systems is a course covering Computer Architecture, Binary Representations, IEEE Floating Point Representation, Stack Discipline, Buffer Overflow Attacks, Instruction-level Parallelism, Pipelining, Caching, Performance Optimization of Software Programs, Linking, Exceptional Control Flow, e.g. Signal Handling and Shells, Virtual Memory and Dynamic Memory Allocation on the Heap, e.g. malloc().
Provided office hours for students for 9-10 hours a week, help produce course materials and ensure the course runs smoothly while helping students excel at a challenging course with non-intuitive material.
- Sept. 2017 to May 2018 **Office of Information Technology**
General Desktop Support Technician
General IT Support, everything from virus removal to repairing various hardware and software problems with the mantra that we solve every problem someone comes in with "Best Possible Effort".
- Aug. 2018 to Current **Department of Aerospace Engineering**
Autonomous Vehicle Systems (AVS) Lab Research Assistant
Help build Basilisk, a spacecraft simulation framework in a Python library, primarily written in C++, that provides faster than real-time simulations of spacecraft dynamics, with options for repeatable Monte Carlo simulations and Hardware-in-the-loop simulations. Models orbital dynamics in a complex and wholesome way, including modeling for Solar Radiation Pressure, Fuel Slosh, Gravitational N-body systems and Atmospheric Drag with Flexible Panels. Allows testing of flight algorithms concerning guidance, control, navigation and sensor processing. Also provides a 3D visualization to adjust the simulation in real time. Currently building a OpenAI Gym for reinforcement learning and control algorithm testing for space vehicles.

» education

university of colorado - boulder
B.S. Computer Science 2020
B.S. Applied Mathematics 2020
GPA 3.442
Applicable CS Courses: Computer Vision, Software Tools and Development, Intro to Robotics, Data Structures, Algorithms, Computer Systems, Operating Systems, Programming Languages and Interpreters, Human-Centered Computing
Applicable Math Courses: Discrete Mathematics, Applied Linear Algebra, Multivariable Calculus, Differential Equations, Partial Differential Equations, Applied Probability, Numerical Analysis

» awards

Polycom · 3rd place @ innovation day hackathon Aug. 2018
Used Deep Learning techniques to predict DMA (Distributed Media Application, one of the core pieces of Polycom's video/audio stack deployed to customers) failure up to 3 days before it happens purely based off of analytics. By treating the data as a time series and using Entity Embedding to provide automatic feature engineering for categorical variables, I was able to correlate failure across the entire range (over 1000 entries per data point) to a high degree of accuracy. In winning this, I competed against 20+ full time engineers, was the only intern to enter and, by their own vote, beat them out for a 3rd place finish winning a substantial prize.

» projects

- Forever fast** Spring 2018 to Spring 2018
A procedurally generated, 3D "runner" type game created with the help of Three.js. The game has the player fly through caverns generated with Worley Noise on Web Worker threads doing generation in the background to keep the frame rate high while running computationally complex world generation. This results in a responsive game that pushes the edges of what a browser is capable of. The team and I would like to revisit the project in the future.
- javascript-like interpreter** Aug. 2017 to Dec. 2017
For a Programming Language Theory Course, I wrote a interpreter for a language much like Javascript in Scala. The style was primarily functional and we used a state monad to represent changes in state.
- rusty chip-8 emulator** Fall 2017 to Spring 2018
A emulator of the Chip-8 Virtual Machine implemented in Rust.
- turbo engima 3** Jan. 2017 to Fall 2017
A tile-based, modable 2d dungeon crawler written in C++ on bare metal SDL2 (to port to other OSs than windows) for Software Development and Tools. My contributions to the project: OS layer, media loader, all of the renderers/cameras, dungeon map generator, entity hierarchy. Currently porting to my private repository to integrate JavaScript as a scripting language for mods.
- predicting device failure with deep learning** Summer 2018 to Aug. 2018
Developed a predictive model for device failure from Call Server analytics to give a early warning sign of likely crashes using Deep Learning for an internal hackathon. Wrangled over 100gb of data from various sources into one, high quality data source. Implemented a paper on Entity Embedding Matrices to automate feature engineering on a very large number of categorical variables. The resulting model was good enough to warrant further investigation by the company as a potential alert tool.
- » **skills**
- programming languages:** C++, Java, Python, C, Rust, Matlab, Mathematica, Bash, Node.js, Elisp
web development tools / languages: Javascript, CSS3, React/Redux, PHP, Webpack, Yarn, Electron, JQuery, Jekyll, Hugo, Wordpress, Elasticsearch, Express.js, MongoDB
software: Linux, Photoshop, VMWare Workstation, Virtual Box, Autodesk Inventor
development tools: CMake, Visual Studio, Git, GitLab, JIRA, GitLab CI, Docker
data science, ml and scientific computing: Pytorch, Fast.ai Library, Jupyter/IPython, Numpy, Pandas, Spacy, SciPy
other skills: Intermediate French, SDL2, Win32 API, OpenGL, Google Protobuffers, zeroMQ, SWIG