

WORK EXPERIENCE

Amazon AI - Software Engineer

Sep 2019 - Present

- o Launched and open-sourced [SageMaker Debugger](#), which automates debugging machine learning training jobs. Second-most prolific code contributor, despite joining only three months before launch. Single-handedly created custom framework forks of PyTorch and TensorFlow to enable zero-code-change functionality.
- o Operational excellence: graph caching algorithms to increase training speed 2x, multiprocessing downloader to increase download speed 2x, test parallelism to increase test speed 3x, autoformatter to limit merge conflicts.
- o Built production infrastructure in the following AWS services: S3, EC2, ECS, ECR, SageMaker, CloudFormation, Fargate, Lambda, CloudWatch, CodeBuild.

Machine Learning Research Intern - Wish

May 2019 - Aug 2019

- o Drove \$5 million increase in annual revenue (0.4% improvement, per A/B testing) by identifying and recommending daily trending products via probabilistic NLP. Applied trends to product recommendations, search autocomplete, and email campaigns.
- o Launched the company's first realtime computer vision pipeline, classifying 100s of images/second with Amazon SQS and TensorFlow Serving in Golang. Efficiently backfilled predictions for tens of millions of products.
- o Created an dataset of 3 million products for category prediction and content filtering. Improved content filtering precision by 15x by training and ensembling both an image & text classifier, mitigating noisy imbalanced data.
- o Used: go, python, mongodb, tensorflow, sql, hive, presto, docker, spark, graph neural networks, natural language processing

Machine Learning Research Scientist - Perception, Control and Cognition Lab

Sep 2018 - May 2019

- o Led a consulting project responsible for \$150,000 in grant funding. Developed sophisticated unsupervised and semi-supervised methods for early alert systems in semiconductor manufacturing.
- o Video frame prediction using invertible neural networks and controlled dynamical systems.
- o Fourier convolutional neural networks, faster inference with activation functions in the complex domain.
- o Used: python, pytorch, numpy/scipy, docker, openev, c++

Microsoft - Software Engineer Intern

May 2018 - Aug 2018

- o Launched a secure VPN type for Microsoft Azure enterprises, immediately enabling 1,000 new client subscriptions and increasing monthly revenue by \$100,000. Completed project three weeks ahead of schedule.
- o Gathered requirements from external VPN provider, fixed critical bugs, and developed end-to-end features.
- o Improved service uptime and build speed by migrating portions of the monolithic codebase to microservices.
- o Used: c#, typescript, bazel, selenium, git

MantisX - Software Developer

Jun 2016 - May 2018

- o Created realtime on-device inference neural networks on iOS and Android for firearm shot detection from gyroscopic timeseries data. Achieved industry-best performance of 99% accuracy with a 2% false positive rate.
- o Designed, deployed, and scaled a production database handling 50K monthly active users and 200MM shots.
- o Opened a market partnership with the U.S. Marines by creating secure private groups.
- o Used: django, postgresql, aws, python, tensorflow, redis, html/css, javascript, git

PUBLICATIONS & PROJECTS

Wasserstein Neural Processes: NeurIPS 2019 Optimal Transport Workshop, [arXiv:1910.00668](#)

Video Extrapolation with an Invertible Linear Embedding: [arXiv:1903.00133](#)

March Madness: Modified Google's PageRank algorithm to track basketball team strength instead of website popularity. Won my group in ESPN's bracket challenge, probably through a fair amount of luck.

Open Source: Contributor to tensorflow, numpy, and hyperopt.

EDUCATION

B.S. Applied Mathematics; 3.82 GPA

Brigham Young University

Apr 2019

Provo, UT