

RELEVANT EXPERIENCE

OpenAI - Member Of Technical Staff (Fellow)

May - Nov 2021

- o Run evaluations and benchmark performance on Codex program synthesis models included in "Evaluating Large Language Models Trained on Code"
- o Designed, researched, and created novel datasets in Pyspark resulting in a 2x model performance improvement. These datasets replaced old benchmarks and became the standard training sets used across the entire team
- o Improved throughput of model inference by 66x and scaled to hundreds of GPUs using MPI, internal tools, and distributed Pytorch training
- o Developed demos and internally showcased emergent model behavior
- o Led research project from ideation to completion, presenting findings to CTO and chief scientist

Google Brain - Research Intern

May - Nov 2020

- o Contributed key mathematical and algorithmic insights into a new self-supervised pretraining method that leverages recent advances in differentiable sorting for representation learning
- o Defined new state of the art performance for audio and vision based tasks
- o Streamlined and standardized several scattered experiments across notebooks and code bases. This drastically increased team productivity and we were able to launch multiple large scale experiments daily
- o Designed and developed two novel metrics to measure experimental success now used by the team to communicate our findings
- o Orchestrated foundational experiments across thousands of GPUs and decreased data loading time from 5 minutes to 300ms
- o Explored mathematical relationship between entanglement and optimal transport distance, presented work to team
- o Explored the literature and successfully reproduced results from the field which increased our ability to iterate and improve upon existing research
- o Published findings in IEEE Journal for signal processing

Lyft, Level 5, Autonomous Vehicles - Software Engineering Intern

June - Aug 2019

- o Developed A/B testing platform in high performant C++ to compare prediction models locally and in the cloud greatly increasing my team's development velocity
- o Identified predictive features and developed real-time feature extraction system for use in machine learning pipeline
- o Explored statistical and neural models for dynamical vehicle motion prediction leading to a 22.5% performance improvement
- o Lead 3 engineers in exploratory 20% project for semantic code search
- o Presented research to members of my team, explaining relevant topics and mathematics to apply to our technology stack

Qualtrics - Software Engineering Intern

May - Aug 2018

- o Achieved ~96% accuracy with a .005% false positive rate, matching state of the art on phishing detection by researching and implementing system using sophisticated NLP feature engineering and machine learning
- o Increased speed of system 3x resulting in a 63% reduction in hardware costs while handling 3 million daily requests by engineering asynchronous API using parallel processing and high performance computing techniques
- o Identified, explored, and implemented state of the art emerging topic tracking system which allowed my team to reach their stretch goals for the quarter and led to a **patent**
- o Built question similarity tool using sentence embeddings after collecting and curating a dataset of ~130,000 questions. Improved f1 score from .3 to ~.7 built using both structured and unstructured datasets
- o The final estimated impact of my internship is \$300k - 500k in yearly savings

Amazon Alexa Prize: Team Eve - Machine Learning Research Engineer

Jan - Apr 2018

- o Member of team Eve for the Alexa prize challenge. One of eight teams selected out of hundreds to research and build a social chatbot system to hold arbitrary conversation for 20 minutes on any topic
- o Designed and built an offensive speech filtering system using probabilistic methods, which performed ~3% better than current industry standards
- o Researched and designed a complex sentiment analysis tool that classified sentences as having complex sentiment used for noteworthy knowledge retrieval

EDUCATION

M.S. Computer Science; 4.0

Brigham Young University

2020

Provo, UT

B.S. Applied and Computational Mathematics; 3.81

Brigham Young University

2018

Provo, UT

OTHER EXPERIENCE

Author - Everyday Data Science 2021: Best selling book about using Data Science in daily life, 1500+ copies sold

1st place BYU AI Club Hackathon 2020: Built a computer vision controlled robotic hand

2nd place BYU ACM Hackathon 2019: Built a computer vision pong game that is controlled with hand detection

2nd place BI Wolff Hackathon 2018: Built prescriptive ML solution to predict individual risk of becoming homeless

1st place BYU ACM Hackathon 2017: Created Auto Dino program to perfectly play the chrome dino no wifi game

1st place BYU ACM Hackathon 2016: Created *Mathify* app using polynomial interpolation to display text as math

1st place BYU ACM Summer Coding Competition 2018, 2019

2nd place Global Legal Hackathon Utah 2018: Made a chrome extension using NLP to summarize terms and conditions which I turned into a product, grew to 2000 active users, and sold

Python 3.8 Open Source: Fix small doc bug in cpython pull #11683

pyprobml Open Source: A primary contributor for Machine Learning a Probabilistic Perspective v2 Python code with Dr Kevin Murphy

Data Science Blog: 300+ monthly readers. Data science problems solved with esoteric programming languages

Ranked 8th in world: Tetris in spring of 2011