JACOB STERN CV

+1-330-422-8444 ◇ jastern33@gmail.com ◇ jacobastern.com

EDUCATION

Brigham Young University 2020-2024
Ph.D. Computer Science
GPA: 3.9

Brigham Young University 2020-2021
M.S. Computer Science
GPA: 3.9

Brigham Young University 2016-2020
B.S. Applied and Computational Mathematics
GPA: 4.0

RESEARCH AND PUBLICATIONS

Generative Pre-training for Protein Structure Prediction 2020-2021

Designed neural network that can predict high-quality protein structures **5 orders of magnitude faster** than the current state-of-the-art networks (publication estimated August 2020).

· Stern, Jacob; Generative pre-training: Improving tertiary protein structure prediction with self-supervised learning. Poster presented at CASP14, November 2020.

· Stern, Jacob; Christopherson, Max; Protein structure prediction via generative pre-training. Presentation at BYU Student Research Conference, February 2021.

Protein Design with Transformer Autoencoder 2020-2021

Developed a Transformer Autoencoder to translate back and forth between discrete sequence space and a continuous protein emebdding space. Optimizing over continuous protein embedding space to maximize enzyme activity for a given substrate.

Stern, Jacob; Protein design via optimization over protein embedding space. BYU CPMS Three-Minute Thesis Competition, February 2021.

Spatial Attention for Medical Imaging 2019

Implemented several spatial attention mechanisms for medical image segmentation. Engineered 75x speed-up for model training (minutes vs. days) by devising a custom data-loading method for a large dataset. Reduced start-up/spin-down time by writing Bash scripts to automate research workflow, including SSH, Docker container set-up, and Tensorboard logging.

WORK EXPERIENCE

· **Enveda Biosciences** 2020
Deep Learning Consultant

Built training pipeline for pre-trained Transformer for mass spectrometry similarity prediction. Adapted base Roberta architecture for challenges specific to mass spectrometry data.

Nvidia 2020
Deep Learning Architecture Intern

Wrote software for kernel-by-kernel performance analysis of deep learning workloads on Nvidia GPUs. Enabled performance gains on the MLPerf benchmark by adding support for MXNet implementations of Single-Shot Detection and Resnet.

CaptionCall 2018
Speech Recognition/Machine Learning Intern

Benchmarked speech recognition providers by programming clients for speech recognition APIs. Wrote clients to stream audio data in real time for via asynchronous programming in C#.

TEACHING

Deep Learning - CS 474 2019
Head Teaching Assistant

Head teaching assistant for a class of 150 students. Taught weekly deep learning tutorials. Wrote a lab on transfer learning. Spent 10 hours/week helping students code neural networks in Pytorch.

PROJECTS AND EXTRACURRICULARS

Poster – Bias-Variance Decomposition of MSE for Regularized OLS 2019

Derived theorem for uniqueness of solutions to the regularized OLS problem. Derived the bias-variance decomposition of MSE for regularized least squares estimator. Presented poster on results of research.

Literature Review – Flow-based Generative Models 2019

Wrote a 12-page literature review paper on flow-based generative models, an emerging field of deep learning research.

AIChE ChemE Car Club 2016-2017
Electrical Engineering Specialist

Designed and programmed electronics for chemical-powered car using Arduino.

NON-TECHNICAL EXPERIENCE

Aspiro Adventure 2017
Wilderness Therapy Field Guide

Worked as a field guide. Led groups of 6-12 students on 9-week wilderness excursions, teaching them wilderness survival skills. Helped young people overcome personal challenges through wilderness survival.

The Church of Jesus Christ of Latter-day Saints 2014-2016
Full-time Missionary in San Fernando, CA

Full-time volunteer for my church, serving the Hispanic population in San Fernando, California. Spent 2 years doing service and helping people learn from the teachings of Jesus Christ. Served in a variety of leadership capacities.