ANKUSH HOMMERICH-DUTT

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EXPERIENCE

Research Intern – Machine Learning

Cadence Design Systems - Special Projects Team

📅 June 2019 – September 2019   📍 San Jose, CA

- R&D project into acceleration of convolutional neural network inference
- Developed entire software stack to obtain neural network from high-level ML frameworks, perform quantization to reduce storage and bandwidth costs, and convert to a representation for the accelerator
- Helped design a 2D grid of processing elements on the accelerator, which involved coordinating the movement of data between processors for the different types of neural network layers (convolution, pooling, etc.)
- Wrote a scheduler to assign instructions to the grid of processors to optimize communication and time constraints during inference

Research Intern – Distributed Computing

College of William and Mary

📅 June 2018 – September 2018   📍 Williamsburg, VA

- Researched into parallelizing a randomized SVD algorithm across a cluster by distributing the matrix multiplication and QR factorization operations
- Implemented the parallelized algorithm in the Apache Spark framework using its distributed data structures, with extensive work into optimizing code that runs on the Java Virtual Machine
- Work was part of an open-source eigensolver package name PRIMME
- Presented research at SURF Seminar Day at Caltech

Research Intern – Applied Math

NASA Langley Research Center

📅 September 2016 – June 2017   📍 Hampton, VA

- Analyzed the computational error of several finite difference approximation algorithms for the 1D heat equation to determine the optimal algorithm to use given a certain mesh spacing and time step
- Implemented many finite difference method algorithms for the Aircraft Noise Prediction Program (ANOPP2) software

PROJECTS

GPU Accelerated AI

- Developed an AI for the Gomoku game and sped up the tree searching of the minimax algorithm by a factor of 100x on the GPU (compared to CPU)

ML Class Projects

- Deep Generative Models: Modified a variational autoencoder to help create an active map searching algorithm that optimizes bandwidth usage
- Kaggle: Used survey data to predict voter turnout using random forests and gradient boosting, finished in top 20%
- ML applications: Used Hidden Markov Models and recurrent neural networks to generate Shakespeare poems with rap lyrics

EDUCATION

B.S. – Computer Science
Minor – Data Science

California Institute of Technology

📅 2017-2021   📍 Pasadena, CA

High School Valedictorian

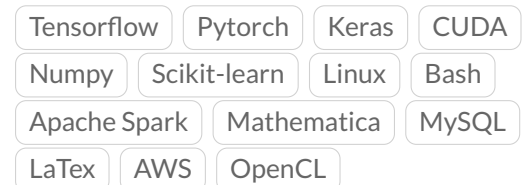**Hampton High School / Governor's School for Science and Technology**

📅 2013-2017   📍 Hampton, VA

LANGUAGES

Python, C, C++, MATLAB ●●●●●
Scala, SQL, OCaml, Verilog ●●●●○
Java, HTML, x86 Assembly ●●●○○

TECHNICAL SKILLS

Tensorflow   Pytorch   Keras   CUDA
Numpy   Scikit-learn   Linux   Bash
Apache Spark   Mathematica   MySQL
LaTex   AWS   OpenCL

COURSEWORK

- ML Theory
- ML Applications
- GPU Programming
- Algorithms
- Data Structures
- Digital Electronics
- Complexity Theory
- Operating Systems
- Databases
- Networking
- Finance
- Computer Graphics
- Applied Linear Alg.
- Distributed Comp.

EXTRA-CURRICULAR

- Was ranked #1 in Virginia for speed-solving the Rubik's cube with an average of 9.24 seconds
- Helped organize 6 large-scale Rubik's Cube competitions at Old Dominion University (with an average competitor size of 100)
- Tutoring high-schoolers in mathematics
- Playing racquetball, watching NBA basketball