Hershel P. Shah

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Experience

Senior GPU Software Engineer March 2024 – Current
Roche Diagnostics *Santa Clara, CA*
GPU Software Engineer *July 2021 – March 2024*

- Designed/Implemented a high-throughput (8GB/s) file writing using C++, CUDA, DirectIO, and GDS for outputting real-time DNA sequencing data.
- Optimized CUDA kernels with memory coalescence and shared memory and increasing performance by 25%.
- Integrated DPDK libraries allowing application to ingest up to 12 GB/s of DNA sequencing data encoded as packets over Mellanox cards.
- Created disk I/O benchmarking app for characterizing performance with DirectIO, GDS, and HDF5 writing.
- Designed/Implemented workflows for benchmarking and regression testing in Github Actions across various GPU architectures (sm_70, sm_80, sm_90).
- Designed/Implemented an inter-process FIFO (12GB/s) with CPU/GPU synchronization mechanisms.
- Converted, optimized, and benchmarked different CNN's for classification using PyTorch and TensorRT in Python.

Systems Software Engineer August 2020 – May 2021
General Automation Laboratory Technology *San Carlos, CA*

- Maintained the core business application performing image analysis, instrument communication, and data storage/retrieval in C#.
- Implemented Poisson statistics calculator to dynamically determine dilution factor for getting a set number of bacterial isolates.
- Investigated algorithms for well selection to implement an arbitrary picker tool for micro-array chips.

Systems Software Engineer January 2019 – January 2020
Prellis Biologics *San Francisco, CA*

- Patent (WO2020028431 - Methods and Systems for Three-Dimensional Printing) for software methods on holography based 3D printing.
- Designed and implemented a real-time pipeline to process STL models (custom watertight voxelization, morphological operators, k-means clustering, software based optical correction) for a computational holography.
- Designed and implemented a Python micro-service to control, calibrate and communicate between hardware (3 axis stages, SLM, liquid lens, industrial laser).
- HolographX (designed and implemented software) won the Innovation Award at the Merck Technical Symposium.

Wireless Hardware/Electronic Systems Intern June 2018 – September 2018
Tesla *Palo Alto, CA*

- Created an in-car suite of BASH tools to reduce reducing engineering time by 50% for the measurement, analysis, and performance of Radio quality.
- Designed and implemented radio test suite decreasing testing time by automating the test process using PyVisa.
- Designed experiments to determine the feasibility of In-Car wireless harness using Python and BASH.
- Created RF test suite (Bluetooth, 802.11b/g/n, WCDMA, GSM, and LTE) using PyVisa.

Technical Skills

Languages: C/C++, Bash, Python, Java, Golang (Go), Matlab/Octave, Verilog, Rust
Frameworks/Libraries: CUDA, Boost, CMake, Bazel, OpenCV, Numpy, Matplotlib, Pandas, Redis, Git, ZeroMQ, DPDK, RabbitMQ, OpenMP, FastAPI, Docker, SQL/NoSQL, PyVISA, PyTorch, TensorRT, Github Actions, NSight Systems, NSight Compute, Intel VTune

Education

University of California, Davis Davis, CA
Bachelor of Science in Electrical Engineering *Sept. 2015 – Dec. 2018*

- Relevant Coursework: Electromagnetics, Non/Linear Circuits Analysis, Device Physics, Digital System Design, RF and Microwave Engineering, Antenna Design and Analysis, Computer Architecture, Parallel Programming in CUDA, and Signal & Systems
- Performed simulations of various infinite meta-surfaces in the Giga/Tera hertz range for satellite communications.