Ivan Zou

US Citizen | Willing to Relocate | (774) 505-5949 | izou3@gatech.edu | https://github.com/izou3/

Objective

Self-driven and relentless learner with a strong foundation in computer architecture and systems. A hungry student who combines discipline, deliberation, appreciation, and heart to pioneer realities in machine learning and distributed applications that optimize hardware. Seeking an internship in embedded firmware or hardware design/verification for the summer of 2022.

Education

Georgia Institute of Technology | Atlanta GA *Fall 2019 - Present*

Bachelor of Science in Computer Engineering, GPA 4.00, Honors Program Expected Graduation, May 2023

Skills

Programming: Verilog, Assembly (MIPS), C, Python, JavaScript/Typescript, Java, SQL
Hardware: ARM mbed microcontroller & common IO Devices, Intel DE-10 Lite FPGA, Raspberry Pi, Oscilloscope
Software: Pytorch, NodeJS, ReactJS and Redux, MaterialUI, React Native, OpenCV, Flowable BPMN, MySQL, MongoDB, Knative
Platform: Kubernetes, AWS, Git/Github, Quartus Prime Lite, Linux, Google CoLab, Docker, Microsoft Office, Jira

Experience

Embedded Pervasive Lab (EPL) at Georgia Tech | Research Assistant | Atlanta GA **December 2021 – Present**

Investigating heterogenous hardware and serverless software architecture co-designs for low latency and high bandwidth Machine Learning application to run efficiently on an Edge Computing cluster in the lab (Rasberry Pis and Edge TPUs).

- Designed implementations of a food waste instance segmentation application from custom CNNs in Pytorch to fine-tuning state-of-the-art model like Mask-RCNN through Facebook AI Detectron2 library.
- Benchmarked the Edge TPUs' hardware utilization and performance bottlenecks through python scripts that automate the simulation of different containerized ML workloads to see a 30% increase in TPU utilization against baseline.
- Experimenting with pipelining inference models across distributed deep learning accelerators through a preemptive dynamic scheduler that optimizes utilization of resources and movement of stateful data across CPU, TPU, and memory.

BlackHorse Solutions | Software Engineer | Herndon VA **May 2021 – August 2021**

Collaborated with the Cyber Development team to engineer a serverless, automated, scalable, and on-demand workflow-as-a-service platform for a government contract to increase the efficiency and usage of offensive cyber-attacks.

- Programmed Kubernetes operators, garbage collection processes, and job queues to synchronize events and stream logs across hundreds of dynamic and distributed containers running phishing exploitation logic in a Kubernetes environment.
- Provisioned Knative and controllers to optimize virtualized resources and used Prometheus and Grafana to track utilization.

Big Sky Lodge | Lodge Manager and Software Developer | Rapid City SD **February 2020 – January 2021**

Developed a fast, resilient, and scalable Motel Management System through NodeJS and Kubernetes for a lodge with over 30 rooms to track and record over 3,000 yearly reservations, generate financial reports, and handle daily operations.

- Constructed the hotel's website and management system's frontend with React-Redux, WebSocket, and MaterialUI.
- Deployed the application as a microservice infrastructure through Digital Ocean's Kubernetes, backend and database servers, proxies, and object storages to serve over 100 application requests per day during the summer months.
- Utilized the software application to solely manage the lodges' everyday operation at over 80% average occupancy including overseeing check-ins, staff of six housekeepers, room maintenance and standards, and customer satisfaction.

Digital Design Lab Project | Atlanta GA **March 2021 – May 2021**

Designed a DC motor controller interface to interact with a Single-Cycle Datapath microarchitecture on an Intel DE10-Lite FPGA.

- Designed using the Quartus Prime Lite framework to interface with the FPGA and debug using wave simulators.
- Engineered decoders, PWMs, and other IO peripherals using VHDL to interface the microarchitecture with the DC motors.

Relevant Coursework

Computer Architecture: Different microarchitectures implementations of the MIPS ISA in Verilog; simulation of multi-layered caches, virtual memory, IO subsystem, and CPU scheduling in C; performance and energy evaluations in modern architectures

Cloud Computing: AWS technologies, tools, & computation models; architect advanced distributed data intensive applications.

Embedded Systems Design (Currently Enrolled): Exploring processors, chipsets, busses, and I/O devices for high-end embedded systems; learning embedded operating systems and device drivers through the mbed microcontroller.