Neo Vasudeva

neo.vasudeva.nv@gmail.com | 980-228-7169 | 624 Swancroft Lane, Matthews, NC | linkedin.com/in/neo-vasudeva-036882154

Experience

Software Development Engineering Intern, Amazon *(June 2021 - Present)*

Developed real-time video processing utilities for video calling:

- Utilized Tensorflow.js to perform fast body image segmentation
- Created video effects such as background blurring and coloring and AR facial filters
- Designed video processing architecture and integrated it with existing video calling system
- Connected UI components created with Vue.js to video processing utilities

Undergraduate Research Assistant - IMPACT Group *(December 2020 - June 2021)*

Accelerating graph computations on GPUs for the DARPA Graph Challenge (publication and award listed below):

- Developed state-of-the-art triangle counting kernels with CUDA C/C++
- Improved existing kernels using shared memory and search space reduction methods
- Heavily used Bash scripting to automate the testing and evaluation of kernels

Software Engineering Intern, AvidXChange *(June 2020 - August 2020)*

Co-branded portal for business partners of AvidXChange:

- Used Less.js and ASP.NET to create custom portals for business partners

Projects

Nanium *(April 2021 - May 2021)*

A scalar 5-stage pipelined 32-bit RISCV (RV32I specification) processor built with SystemVerilog and simulated in ModelSim. Built with 2 other people:

- Designed a forwarding unit to handle data hazards and pipeline stalling
- Created an inclusive 2-level cache hierarchy with directly mapped 16-entry L1 data and instruction caches and an 8-way 8-set L2 cache w/ pLRU replacement policy along with a cache arbiter and cacheline adaptor
- Built a perceptron branch predictor as well as a 4-way 8-set Branch Target Buffer (BTB)
- Wrote various testbenches to unit-test modules

Snake Detector *(June 2020 - July 2020)*

A web application that detects snakes in images:

- Created a webscraper with Selenium to scrape images off of Google Images.
- Cleaned collected data and employed transfer learning to train FAIR's Detectron-2 Mask-RCNN model on a custom training set.
- Created a Flask/Bootstrap application with a microservices approach to allow for fast and easy scalability.
- Created a publicly accessible REST API to perform inference and download train/test datasets.
- Services were containerized with Docker, orchestrated with Kubernetes, and deployed to DigitalOcean Kubernetes Service (DOKS)

nanOS *(April 2020 - June 2020)*

A simple operating system written in C for Intel's IA32 Architecture. Built with 3 other people:

- Supports paging, round robin scheduling, system calls, read-only filesystem loaded to memory on boot
- Wrote drivers for PS2 keyboard and text output
- Can run basic user level programs such as a shell, cat, ls, etc.

Galaga *(November 2019 - December 2019)*

A simplified version of the arcade game Galaga implemented with SystemVerilog on an FPGA:

- Designed a state machine to control game flow and level progression
- Implemented various controllers to manage enemy movement, hit detection, and display through VGA
- Utilized onboard 32-bit NIOS II processor to manage I/O-bound tasks such as keyboard input
- Wrote various testbenches to unit-test modules

Education

- University of Illinois Urbana-Champaign, BS in Computer Engineering *(August 2018 - May 2021)*
  Cumulative GPA: 3.93/4.0, Graduated with Highest Honors, Organizations: Eta Kappa Nu, IBIS - Illinois Competitive Badminton

Technical Skills

- **Languages**: SystemVerilog, C, C++, Python, Java, Javascript/Typescript, HTML/CSS, SQL, Cypher
- **Tools, Libraries, Frameworks:** CUDA, Bash, Docker, Kubernetes, Node.js, Vue.js, Bootstrap, Flask, MongoDB, MySQL, Neo4J, PyTorch, Tensorflow, GCP, AWS

Publications

- Mohammad Almasri, Neo Vasudeva, Rakesh Nagi, Jinjun Xiong, Wen-Mei Hwu, *"HyKernel: A Hybrid Selection of One/Two-Phase Kernels for Triangle Counting on GPUs,"* in 2021 IEEE High Performance Extreme Computing Conference (HPEC). IEEE, 2021, pp. 1–7.

Awards & Certifications

- **Awards**: 2021 Student Innovation Award (for publication), Dean's List (x5), National Merit Finalist
- **Certifications**: Oracle Java SE 8 Programmer II Certification