Yilun Xie

242 Mt Evans Dr | Durham, NC 27705 | 1-(470)-424-5075 |yilun.xie@duke.edu

Objective

Master student in Computer Science major with strong skills in coding and robust background in operating system, driver development, computer architecture and machine learning. Looking for **full-time position** with a focus on **infrastructure software engineering** start on May/June 2022.

Education

Duke University | Durham, NC   August 2020 -- Present
M.S. Computer Science
Georgia Institute of Technology | Atlanta, GA   August 2016 -- May 2020
B.S. Computer Engineering

Experience

Qualcomm CR&D | Boulder, Co   May 2021 – August 2021
Software Engineer Intern
Develop device driver for Qualcomm's **Cloud AI 100 inference accelerator**.

- Implement user space device driver with **Data Plane Development Kit (DPDK)**, reducing the system overhead and improving the data transmission latency.
- Modifying the existing **kernel module driver (KMD)** to allow device memory mappings to user space.

Georgia Institute of Technology | Atlanta, GA   *August 2018 – August 2019*
C++ Tutor | Electric and Computer Engineering Department
Teach programming for undergraduate students

- Teaching undergraduate students programming skills and fundamentals of data structure and algorithms, which improves their understanding of the course material and polishing of their **C++** programming ability.

Research & Projects

Synergy Lab   *January 2019 – May 2020*
*Implement **machine learning** algorithms and build computer system optimized for **DNN** operation on the edge*

- Build low cost system using **Raspberry Pi** and Intel **Movidius** optimized for deep neural network operation to replace traditional computers with large form factor.
- Run **image classification** module on the raspberry Pi with Intel Movidius stick, increasing the performance by 800%.
- Use **distributed learning technique** (NEAT) to enable DNN training/fine-tuning on the **edge devices**.

TCP BBR   *September 2020 – November 2020*
*Develop network emulation program to compare TCP **BBR** with other **TCP** implementation*

- Researched and implemented network simulation tool using **MiniNet** to benchmark the performance of TCP **Reno**, **Cubic** and **BBR**.
- Testing with different usage scenario by creating **customized topology** for each TCP experiment to better simulate the real world.
- Thoroughly analyzing the result by producing figures of sending rate, retransmission rate, CWND and average RTT, showing the strength and weakness of TCP BBR against traditional TCP protocols.

Superscalar Pipelined Processor Simulator   March 2019 -- May 2019
Implement out of order execution in a superscalar pipelined processor with speculative execution and cache management

- Construct a simulator for an **out-of-order superscalar processor** that dispatches F instructions per cycle and uses the **Tomasulo** algorithm with a scheduling queue comprised of reservation stations.
- Implement a **Gshare** branch predictor to support speculative execution
- Implement a basic **direct mapped L1** Data Cache to speed up store and load instructions.

Publication

Characterizing the Deployment of Deep Neural Networks on Commercial Edge Devices   *June 2019 – November 2019*
R. Hadidi, J. Cao, Y. Xie, B. Asgari, T. Krishna, H. Kim
2019 IEEE International Symposium on Workload Characterization (IISWC) | Orlando, Florida

- Analyze DNN frameworks and their impact on performance on edge devices. Measure energy consumption and temperature behavior of these edge devices.

Skills

- **Programming:** Python, C, C++, OpenMP, MPI, OpenGL, VHDL, MATLAB
- **Software/API:** Linux**,** Pytorch, Tensorflow, Café, Altera Quartus II, OpenCV, GitHub, Jekyll, GCP, AWS
- **Concept:** Machine Learning, Data Structure and Algorithms, Computer Architecture, Deep Neural Network, Networks, PCG
- **Hardware:** Cloud AI 100**,** Google Edge TPU, Raspberry Pi, Arduino, ARM mbed microcontroller, Intel Movidius Stick, FPGAs, oscilloscope
- **Languages:** Chinese (native), English (fluent)