Kyle Marino

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Summary

Electrical computer engineering student pursuing a Master's at the University of Southern California. Experienced in machine-learning, FPGA design, embedded software, cloud computing, and board design.

Education

University of Southern California ■ Los Angeles, CA

2019 - Present

B.S. Electrical and Computer Engineering (2023) - Presidential Scholarship, Summa Cum Laude
M.S. Computer Engineering (2024)

Coursework: Computational Intelligence and Neural Learning, Internet and Cloud Computing, Computer Systems Organization, SOC Design, Deep Learning, Probability Theory, Linear Algebra

Experience

Directed Research ■ Los Angeles, CA

Advised by Dr. Viktor K. Prasanna — **Feb 2023 – Present**

- Designed a Vision Transformer accelerator for FPGAs, achieving up to a 17.89x reduction in memory bandwidth and a 2.16x improvement in throughput per DSP over SOTA designs
- **Kyle Marino**, Pengmiao Zhang, & Viktor K. Prasanna. ME-ViT: A Single-Load Memory-Efficient FPGA Accelerator for Vision Transformers. *High Performance Computing (HiPC),* 2023. **Best Paper Award**

AMD/Xilinx ■ San Jose, CA

RTL Integration Intern — **May 2023 – Aug 2023**

- Designed a large-scale distributed RTL design rule verification system that analyzes full-chip RTL
- Developed scripts for generating interposer layers to connect various FPGA dies within one package

SOC Integration Intern — **May 2022 – Aug 2022**

- Ran full-chip builds of FPGAs and completed EMIR simulation with Red Hawk SeaScape
- Designed and integrated Python and Perl tools for automated EMIR reporting and simulation processes

Class Projects

Computational Intelligence and Neural Learning (EE 689) — **Aug 2023 – Present**

- Developed a novel method for generating adversarial attacks to force arbitrary language model hallucinations

Internet and Cloud Computing (EE 542) — **Aug 2022 - Dec 2022**

- Designed a custom file transport protocol with multithreaded UDP sockets that outperforms TCP over a high loss link, achieving over 75 Mbps out of 80 Mbps theoretical
- Modified TCP Linux kernel to improve throughput over a high loss link, from 480 Kbps to 10 Mbps
- Led hardware development of a low-power GPS tracking solution, designing power-switching circuits and detection algorithms for a highly efficient prototype with real-time web interface

USC Rocket Propulsion Laboratory ■ Los Angeles, CA

Lead FPGA Engineer **Sep 2019 – Jan 2023**

- Architect for a 4 sensor data collection and processing system using an Intel MAX10 FPGA
- Designed a custom float processing ALU for real-time quaternion integration of high throughput data
- Developed Python compiler to generate ROM-based instructions for the processing unit
- Wrote Verilog implementations of the SD Bus, I2C, and SPI interfaces for ADCs, IMUs, and off-chip memories

PCB Designer

- Designed a high-speed PCB for the FPGA platform, incorporating both analog and digital circuits
- Led development a new battery management PCB with custom monitoring, charging, and safety features
- Wrote C++ drivers to interface with the FPGA and battery management boards
- Hands-on lab bring-up and debugging using test equipment

Really, Inc. ■ Mountain View, CA

Backend Development Intern **Jun 2018 – Dec 2018**

- Collaborated with a small team to develop a machine-learning engine that analyzes changes in social media posts to detect the early onset of potential neurodegenerative diseases
- Developed a program with Node.js and Java that analyzes and stores linguistic changes over time

Personal Projects

Quadcopter Design **Dec 2016 – Jun 2019**

- Designed and built a fully functioning, self-stabilizing quadcopter with camera streaming capabilities
- Wrote all embedded software, including drivers for various sensors and serial communication

3D Physics Engine **Nov 2019**

- Wrote a GPU-accelerated, real-time physics and rendering engine in Java on top of LWJGL
- Developed a custom collision-detection algorithm for any arbitrary object model

Leadership

USC Climbing Team Captain **Aug 2021 – Present**

- Lead weekly team practices and develop group workouts for competition training
- Mentor members on technique, strength training, and injury rehab

Los Altos Hacks Organizer **Jan 2017 – Jun 2019**

- Contacted companies for scholarships and helped the team raise over $25,000 for the event
- Worked with a team of 12 students to secure funding, a venue, judges, and participants for the hackathon

Other Activities

Eagle Scout **2018**

SM Hacks Best Web Application **2017**

Code Day Hackathon Best Web Application **2016**

Rock Climbing, Guitar, Kendama