

Simon Zirui Guo

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EDUCATION

University of California, Berkeley

Honors, B.S. Electrical Engineering & Computer Sciences

May 2023

GPA: 3.96

Coursework: Operating Systems & System Programming, Digital Design & Integrated Circuits, FPGA, Computer Architecture, Artificial Intelligence, Data Structures & Algorithms, Signals & Systems

SKILLS

Languages: Proficient: Python, Java, C / C++, SQL, HTML/CSS; Others: JavaScript, Lisp, Solidity, Rust*
Technologies: Pandas, scikit-learn, Docker, ONNX Runtime, OpenMP, Node.js, React, Flask, Linux, AWS, Git
Hardware: Verilog, RTL Design, FPGA, Assembly (RISC-V, x86), LTSpice, Microcontrollers, DNN Accelerator

WORK EXPERIENCE

NVIDIA | DRIVE Division, Autonomous Vehicle Development Platforms
Software Engineering Intern, Autonomous Vehicle

Santa Clara, CA
Summer 2021

- Designed the **network communication backend** for vehicle touchscreen UI to control autonomous driving software, sensors, compute SoCs for NVIDIA's **Hyperion 8 Autonomous Vehicle platform**.
- Generated **labelled data for the AV org data pipeline** from vehicle systems and test drive missions, including incident survey upon disengagement, driver-tagged scenarios, and vehicle device & network logs.
- Technologies used: Python, React, Node.js, Docker, Protocol Buffers, TCP, MongoDB, CAN Bus, WebSocket
- Created a service application to coordinate **graceful shutdown** of **DRIVE Orin SoCs** via CAN messages and enable **hardware-in-the-loop simulation**; to be in future vehicles by NVIDIA partners such as **Mercedes-Benz**.

HAX & SOSV | Hardware Startup Accelerator and Venture Capital
Mechatronics Engineering & Analyst Intern

Remote Summer 2020
Shenzhen, China Summer 2019

- Prototyped world's first **autonomous pesticide-free farm-weeding robot**, which uses computer vision to identify weeds and remove them via precisely-dropped hot vegetable oil; revealed at **TechCrunch Hardware Battlefield**.
- Calculated latency requirements for deep learning inference during high-speed operation. Modified vehicle to install CSI-cameras & NVIDIA Jetson AGX Xaviers with IP67-standard enclosures to satisfy field environments

Interaxon | Company behind Muse, the Most Popular Consumer Brain-Computer Interface
Software Engineering Intern, R&D

Toronto, Canada
Summer 2018

- Built **software architecture (Python, C++)** that composes audio soundscapes using realtime biometric data, supporting **300K+ legacy and new Muse brain-sensing headband devices** till this day.
- Integrated the designed solutions for the **new product launch** which won the **CES 2019 Innovation Awards**.

RESEARCH EXPERIENCE

Agile Design of Efficient Processing Technologies Lab | Computer Architecture Research
Undergraduate Researcher, **Gemmini Project** (funded by **DARPA RTML**), PI Prof. Sophia Shao

Berkeley, CA
Jan 2020 - Now

- Conduct **performance analysis** of running Convolutional Neural Networks (such as ResNet-50) inference on different **RISC-V hardware accelerators** configurations (systolic arrays, vector units) using FPGA simulation.
- Map neural network architecture to execute on custom hardware modules by maintaining **RISC-V support for ONNX runtime** and contributing to **microsoft/onnxruntime**.

RISE Lab | Systems Research For Self-Driving Cars and Realtime ML Applications
Undergraduate Researcher, **ERDOS (Elastic Robot Dataflow Operating System) & Pylot Project**

Berkeley, CA
Jan 2020 - Now

- Improved **Frenet Trajectory Planner** for autonomous vehicles **motion planning**, using an anytime and parallelized design in **C++**, to achieve high utilization of runtime deadlines; result submitted to **SOSP 2021**.

PROJECTS & INITIATIVES (see simonguo.tech for more)

Blockchain for Developer DeCal, Berkeley CS 198-097 | Instructor (40+ students, 5K+ online views) *Spring 2020*

- Designed **lectures and coding assignments** on blockchain data structures, distributed system design, devtools, security best practices, network analysis, privacy-preserving verifications, in **Python, Solidity, and TypeScript**.