QISHEN (SAM) LIANG

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EDUCATION

University of Southern California — Los Angeles, CA
Master of Science in **Computer Science (Computer Networks)** — August 2023-May 2025

UC Santa Barbara — Santa Barbara, CA
Bachelor of Science in **Computer Science** & Bachelor of Arts in **Asian American Studies** **CGPA: 3.95** August 2019-June 2023

TECHNICAL SKILLS

- Specialized Knowledge: Mininet, Software Defined Networking, WebRTC, Operating Systems, Cybersecurity, Docker
- Languages and Tools: C++, C, Java, Python, P4 Language, MIPS Assembly, SQL, JavaScript, MS Office, Git
- Methodologies: Artificial intelligence and Machine Learning, Security Systems, Algorithms, Formal Language and Automata, Discrete Math, Data Analysis, Computer Architecture, OOP, Complexity Theory, Writing and Journalism

PROFESSIONAL EXPERIENCE

WebRTC Collection and Analysis Suite Based on NetUnicorn — UCSB Systems and Networking Lab
Undergraduate Researcher — October 2022-July 2023

- Designed and constructed a state-of-the-art Google Account automated login solution using Python and SeleniumBase to bypass bot detection (in order to auto-join online conferences)
- Enhanced the WebRTC data collection pipeline into NetUnicorn, an data collection platform built for distributed computing networks, improving customizability, scalability and efficiency
- Optimized deployment by crafting Dockerfile, saving more than 60% of time and effort compared to manual setup, and oversaw headless ARM64 OS Raspberry Pi data collections, accumulating a total of 5G of data from 3 machines simultaneously

QoE Estimation for WebRTC Video Conferencing Applications — UCSB Systems and Networking Lab
Undergraduate Researcher — September 2021-June 2022

- Engineered and developed a software based on Python and Selenium, enabling an automated end-to-end process of initiation, participation, presentation, and termination of video conferencing sessions
- Integrated and deployed a WebRTC QoS and QoE data collection pipeline to UCSB's PINOT, allowing simultaneous curation of dataset on more than 10 programmable end-hosts
- Researched 1,000+ pages of WebRTC protocols, retransmissions, and multiplexing documentations, drawing connections from RFC documentations to real world data, assisted with tools including NumPy, pandas, SQLite, and Matplotlib
- Curated more than 5 TB of data for analysis and helped formulate a research paper

ACADEMIC PROJECTS

KOS - R3000 based Operating System Development — UC Santa Barbara
Team Leader & Developer — September 2022-December 2022

- Led a 2-person team to program a Linux-based Operating System in C in 10 weeks, encompassing seamless program execution, crash-free operation, support for most Linux commands, and concurrent program execution for up to 8 programs
- Engineered a comprehensive OS capable of running programs and inter-process communication, through pipe handling, PID tracking, and memory management
- Created 30+ files and 5000+ lines of codes for system development, including debugging, updates, comments, and documents

Passive Monitoring and Dynamic Routing in P4Runtime (MRI) — UC Santa Barbara
Developer — May 2023

- Programmed a project implementing passive queue monitoring in network infrastructure, achieved 100% clone and forward rate for congested packets to monitor over 30 minutes
- Augmented switches functionality in P4 code, optimizing packet cloning in egress, instead of ingress, pipeline to alleviate CPU utilization of programmable switches by 20%
- Implemented dynamic routing rules, enabling real-time automatic traffic path adjustments to enhance network performance and maintain smooth data flow under heavy loads, circumventing congestions in less than 1 second after detection

HONORS & AWARDS

UCSB College of Engineering High Honors
UCSB College of Letters and Science Highest Honors
UCSB Asian American Studies Distinction in the Major