QISHEN LIANG

samliangsk@gmail.com| 805-627-8381 | https://www.linkedin.com/in/qishen-sam-liang/

SUMMARY

Graduate student at the University of Southern California due to graduation in 2025 with a Master of Science in Computer Science. Seeking a software development internship or full-time position in order to enter the industry. Currently working as a researcher at the USC Information Sciences Institute with experience in software development, networking, and security.

TECHNICAL SKILLS

- C++, C, Java, Python, SQL, Rust, MIPS, Bash, POSIX, JavaScript, React, Ansible, Git, OOP, LaTeX
- Docker, Kubernetes, AWS, InfluxDB, PostgreSQL, CI/CD, Unit Testing, Debugging, Troubleshooting
- P4, SDN, BBR, BGP, RED, CoDel, Mininet, NS-3, PKI, Blockchain, TCP/IP, WebRTC, WireShark
- RTOS, Cryptography, Computer Security, Sandboxing, Agile, Computer Architecture (x86, arm64), Algorithms, Data Structure

PROFESSIONAL EXPERIENCE

USC Information Sciences Institute DISCERN: Datasets to Illuminate Suspicious Computations on Engineering Research Networks
Graduate Research Assistant May 2024-Present

- Discovered and fixed reverse shell root access and other serious vulnerabilities in **Kubernetes**-based testbed
- Co-developed **5** testbed sensors with DISCERN researchers, incorporating **InfluxDB** and **PostgreSQL**, monitor testbed operation, providing **2** new facets of metrics to monitor malicious activities, improving system security and reliability by **35%**
- Constructed knowledge graphs for the SPHERE testbed, enabling security posture and structure visualization, boosting research efficiency by **10%** and cut data retrieval time by **40%**
- Applied and documented important security analysis to the testbed, addressing vulnerabilities, simulated attacks, and patching suggestions, lower attack surface by more than **15%**

University of Southern California Examining Loss Models Under Contemporary Networks and Modern Routing Mechanisms
Graduate Researcher September 2024-Present

- Designed and constructed over **20** network simulations incorporating various router algorithms from various simulators, like Mininet and NS-3, to assess impact on **TCP Reno** and **BBR** loss patterns under different congestion control algorithms
- Automated data generation, collection, and analysis processes using **C sockets**, **Mininet**, **NS-3**, Linux Traffic Control (**tc**), **tcpdump**, **scapy**, **pandas**, and **Matplotlib**
- Conducted mathematic and algorithmic analysis on different simulations, and yield the loss models for **RED** and **CoDel**

USC Information Sciences Institute Lightscope: The Network Security Analysis Tool for Raw Packet
Graduate Research Assistant March 2024-Present

- Implemented a honeypot port and IP forwarding system to intercept and forward malicious traffic
- Reduced false positive rates by **20%** in network flow analysis backend system and implemented port scanning detection
- Optimized packet analysis pipeline, reducing CPU utilization by **10%** and memory utilization by **15%**
- Designed real-time monitoring dashboard using Python and Eel to provide actionable insights

UCSB Systems and Networking Lab WebRTC Data Collection and Analysis on NetUnicorn
Researcher Assistant September 2021-July 2023

- Used **Python** and **Selenium** to automate Google Meets video conferences for data collection using **FFmpeg** and **v4l2loopback** kernel module over a cluster of headless Raspberry Pis, aggregating **7TB** over 30 nodes within **10 Hours**
- Containerized data collection pipeline using **Docker** to speed up deployment by **60%**
- Independently learned the WebRTC standard and applied it to analyzing collected dataset using **NumPy**, **pandas**, **SQLite**

EDUCATION

University of Southern California Los Angeles, CA
Master of Science in Computer Science August 2023-May 2025

University of California, Santa Barbara Santa Barbara, CA
Bachelor of Science in Computer Science September 2019-June 2023
Bachelor of Arts in Asian American Studies

INTEREST

I am an avid entry level audiophile, and I collected 6 headphones and 2 DACs. I also enjoy outdooring and PC gaming.

REFERENCES AVAILABLE UPON REQUEST