

QISHEN LIANG

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

TECHNICAL SKILLS

- Languages and Knowledge: C++, C, Java, Python (Selenium, Scapy, NumPy, pandas, Matplotlib), SQL, P4, MIPS, Bash, LaTeX, JavaScript, React, Docker, Kubernetes, SDN, AWS, InfluxDB, PSQL, NS-3, TCP/IP, CI/CD, OOP, Debugging, Troubleshooting
- Methodologies: Algorithm, Data Structure, Computer Security, Network, Agile, Computer Architecture (x86, arm64)

PROFESSIONAL EXPERIENCE

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

- Develop a dynamic honeypot forwarding system to intercepted malicious traffic, exhausting attackers' resources by **30%**
- Optimize network traffic flow analysis, enabling faster anomaly detection and dropping false positive rates by **20%**
- Structure and program a real-time monitoring dashboard, providing actionable insights into network traffic and reducing response time to threats by **25%**

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

- Identify and address **1** major security issue (reverse shell root access) and over **3** vulnerabilities in Kubernetes-based Testbed Platform, coordinated with the SPHERE Dev Ops, and mitigated potential risks of unauthorized access and system compromise
- Enhanced scalable data collection and analysis pipeline for **Kubernetes** based testbed, improving process efficiency by **15%**
- Co-develop **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%**
- Establish a knowledge graph for the SPHERE testbed, enabling threat and structure visualization, boosting research efficiency by **10%** and cut data retrieval time by **40%**
- Lower attack surface by more than **15%**, through comprehensive analysis and producing a detailed security report addressing identified vulnerabilities, simulated attacks, and patching suggestions

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

- Developed a Python and **Selenium**-based automated Google login system to bypass bot detection and enable automatic participation in online conferences
- Containerized data collection pipeline with **Docker** into NetUnicorn, increasing deployment speed by **60%**
- Analyzed **10+** key indicators by reviewing **1,000+** pages of WebRTC documentation and aligning with RFC standards using NumPy, pandas, SQLite, and Matplotlib
- Automated headless ARM64 Raspberry Pi systems for data collection, efficiently aggregating **7 TB** across **30** nodes concurrently

ACADEMIC PROJECTS

Examining Loss Models Under Contemporary Networks and Modern Routing Mechanisms Los Angeles, CA
Researcher September 2024-Present

- Design and construct over **20** network scenarios incorporating various router algorithms from various simulators, like **Mininet** and **NS-3**, to assess impact on TCP and UDP loss rates under contemporary high-speed conditions
- Automate data generation, collection, and analysis processes, incorporating **C** socket programming with **Mininet**, **Traffic control** from the Linux Kernel, **tcpdump**, **dpkg**, **pandas**, and **matplotlib**, reducing manual processing time by **40%**
- Conduct comparative analysis from different simulations like **Mininet** and **NS-3**

EDUCATION

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

- Conducting multiple network and security research at USC ISI, instructed by Prof. Jelena Mirkovic and Prof. John Heidemann

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

- Researched online video conferencing performance at UCSB SNL lab, instructed by Prof. Arpit Gupta
- Bachelor of Arts in Asian American Studies** September 2019-June 2023

CERTIFICATE AND HONORS

- Google IT Support Professional Certificate
- UCSB College of Engineering High Honors