

# Feiran (Alex) Qin

Department of Computer Science  
Notrh Carolina State University  
3224 Engineering Bldg II

Email : fqin2@ncsu.edu  
Legal Name : Feiran Qin  
Mobile : (+1) 814-283-5794  
Academic Profile : <https://feiranq.in>

## RESEARCH INTERESTS

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Distributed Systems, Software Reliability, Operating Systems

## EDUCATION

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- **North Carolina State University** Raleigh, North Carolina  
*Ph.D. in Computer Science, Advisor: Prof. Xiaohui (Helen) Gu* Aug. 2023 - Present
- **University of Illinois Urbana-Champaign** Champaign, Illinois  
*Exchange Student, Visiting Researcher, Advisor: Prof. Tianyin Xu* Aug. 2022 - Jan. 2023
- **ShanghaiTech University** Shanghai, China  
*B.S. in Computer Science* Sept. 2019 - Jun. 2023

## RESEARCH EXPERIENCE

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- **NCSU DANCE** Prof. Xiaohui (Helen) Gu  
*System for LLMs (Large Language Models)* Aug. 2023 - Present
  - **Research in Systems for LLMs:** Engaging in literature reviews and practical experiments to uncover and tackle challenges in the reliability and scalability of distributed systems for executing large language models.
- **UIUC Xlab** Prof. Tianyin Xu  
*Implement MXContainer on KNative* Aug. 2022 - Feb. 2023
  - **MXFaaS Implementation on KNative:** Implemented MXFaaS on KNative, introducing the MXContainer abstraction for optimized resource sharing in serverless computing. Achievements include a  $5.2\times$  speed-up in execution,  $7.4\times$  reduction in P99 tail latency,  $4.8\times$  improvement in throughput, and  $3.4\times$  decrease in memory usage compared to standard serverless platforms.
  - **Artifact Evaluation for ISCA 23:** Organized and documented code on GitHub, successfully achieving all three ACM badges.
- **ShanghaiTech HPC Club** Prof. Shu Yin  
*Preparation for Top-Tier Student Supercomputing Competitions* Oct 2020 - Jun. 2023
  - **DevOps:** Managed and maintained two high-performance computers. Responsibilities included system administration, hardware maintenance, hardware innovation, package management, and resource monitoring.
  - **ISC 22 Student Cluster Competition:** Led the ICON project, focusing on an MPI-bounded climate and weather system program. Conducted profiling-guided optimizations on Intel, AMD, and NVIDIA devices within Niagara and Bridges-2 Clusters, resulting in a 30% performance improvement over the baseline. Achievements include significantly reduced MPI wait times, improved CPU affinity, and securing 4th place among international competitors.
  - **AI for Systems Research:** Designed an AI-Scheduler using DQN algorithms to optimize HPC cluster job response times, leveraging program CUDA kernel profiling and historical traffic data. Achieved a 10% improvement in response times in the early version.
- **ShanghaiTech Zlab** Prof. Zhice Yang  
*HCI Research on Acoustic Localization* Feb 2022 - Jun. 2022
  - **2D Gesture Tracking Development:** Developed a 2D gesture tracking system using commercial BLE 5.3 devices for remote video meetings users during the pandemic. Utilized BLE 5.3's 40 ms clock synchronization to enhance tracking accuracy.
  - **Image Encryption for Enhanced Privacy Control:** Developed and integrated image encryption algorithms using OpenCV, based on Paper 1 and Paper 2, into AOSP. Enhanced the Camera2 API and interfaced with Android video streams, leveraging these algorithms for fine-grained privacy control.

## TEACHING EXPERIENCE

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- **NC State University** Raleigh, North Carolina
  - *Teaching Assistant* *Aug. 2023 - Present*
    - **CSC 236**: Computer Organization and Assembly Language for Computer Scientists with Prof. Caio Batista de Melo

## PROFESSIONAL ACTIVITIES

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- **OSDI/ATC 2023**: Artifact Evaluation Committee
- **SOSP 2023**: Artifact Evaluation Committee
- **EuroSys 2023**: Shadow Program Committee

## PROGRAMMING SKILLS

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- **Programming Languages**: C/C++, Assembly, Python, C#, Go, JavaScript
- **System-level Development Stacks**: Linux Development, QEMU, GDB, Make, Linker, Soot, LLVM
- **Frontend Web Development Stacks**: React, Vue
- **Backend Development Stacks**: PostgreSQL, Redis
- **DevOps Stacks**: Caddy, Ceph, Docker, GitLab, Grafana, Kubernetes, Cloud-init
- **High Performance Computing Stacks**: MPI, Spack

## CONTESTS AND AWARDS

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- 2nd, Intel Innovation Hackathon, Beijing, China *Dec. 2020*
- 4th, ISC 2022 Student Cluster Competition, Hamburg Germany (Virtual) *Jun. 2022*