Qizheng "Alex" Zhang

CONTACT INFORMATION
qizhengz@stanford.edu
alex-q-z.github.io

RESEARCH INTERESTS
Networking, Applied Machine Learning, Systems, Security

EDUCATION

Stanford University Sep. 2022 - Now

Ph.D. in Computer Science
Rotation advisor: Prof. Keith Winstein

University of Chicago Sep. 2018 - Jun. 2022

B.S. in Computer Science (with honors)
B.S. in Mathematics, B.A. in Statistics
Advisor: Prof. Junchen Jiang
GPA: 3.92/4.0

PUBLICATIONS

1. Kuntai Du, **Qizheng Zhang**, Anton Arapin, Haodong Wang, Zhengxu Xia, Junchen Jiang. "AccMPEG: Optimizing Video Encoding for Video Analytics"
   Conference on Machine Learning and Systems (MLSys 2022)
2. **Qizheng Zhang**, Kuntai Du, Neil Agarwal, Ravi Netravali, Junchen Jiang. "Understanding the Potential of Server-Driven Edge Video Analytics"
   ACM Workshop on Mobile Computing Systems and Applications (HotMobile 2022)
3. Kuntai Du, Ahsan Pervaiz, Xin Yuan, Aakanksha Chowdhery, **Qizheng Zhang**, Henry Hoffmann, Junchen Jiang. "Server-Driven Video Streaming for Deep Learning Inference"
   ACM Special Interest Group on Data Communication (SIGCOMM 2020)

RESEARCH EXPERIENCE

Research Assistant Sep. 2022 - Now
Stanford Systems and Networking Research Group
Advised by: Prof. Keith Winstein

Proleptic Real-time Music Streaming over the Internet

- Built a system for training DNN to predict real-time music tempo with C++

Research Assistant Oct. 2019 - Sep. 2022
University of Chicago Networked Systems Lab
Advised by: Prof. Junchen Jiang and Prof. Ravi Netravali

Reinventing Video Codecs for Video Analytics Applications

- Engineered the internals of the x264 video encoder and FFmpeg, and implemented a module for macroblock-wise RGB error control with around 500 lines of C
- Implemented an interface for Region-of-Interest encoding in the x264 video encoder that enables fine-grained quality assignment on spatial and temporal scales

Video Streaming and Analytics for Deep Learning Inference

- Co-implemented DDS (*SIGCOMM 2020*), an iterative video streaming system that reduces bandwidth usage by 59%
- Proposed and implemented a saliency-based server-driven video analytics system (*HotMobile 2022*), which achieves 6-8% increase in inference accuracy as well as 40% reduction in bandwidth usage
- Co-implemented AccMPEG (*MLSys 2022*), a camera-side video encoding model that reduces end-to-end inference delay by 10-43%

Research Assistant Jun. 2019 - Aug. 2019
Math & CS Division, Argonne National Laboratory
Advised by: Dr. Mark Hereld and Dr. Nicola J. Ferrier

LightningBug: Mass Digitization of Pinned Insect Specimens

- Co-implemented a camera system that enables rapid scanning of insect specimens
- Reconstructed 3D models of insect specimens in COLMAP with SfM algorithm
- Reduced delay of scanning an insect specimen for 3D reconstruction by 60%

Honors and Awards

- **Magna Cum Laude,** University of Chicago, 2022
- **Phi Beta Kappa,** University of Chicago, 2021
- **Dean's List,** University of Chicago, 2018-2022
- **Robert Maynard Hutchins Scholars,** University of Chicago, 2020
- **Soong Ching Ling Foundation Scholarship,** $12500, 2020
- **Jeff Metcalf Summer Research Fellowship,** $4000, 2019

Teaching Experience

Course Assistant at University of Chicago Sep. 2020 - Jun. 2022
CMSC 15400 - Introduction to Computer Systems
CMSC 23000 - Operating Systems
CMSC 27200 - Theory of Algorithms

Skills

- **Programming**: C, C++, Python, Rust, Bash, SQL, Matlab, R
- **Technologies**: Linux, Git, FFmpeg, Vim, Visual Studio, Make, LaTeX