Haodong "Charles" Wang

haodongw@uchicago.edu | (+1) 773-798-7652| https://daaohame.github.io

RESEARCH INTERESTS

Computer Systems and Networking, Machine Learning Systems

EDUCATION

University of Chicago September 2021 – December 2022
Master of Science in Computer Science, pre-doctoral
Cumulative GPA: 3.97/4
Honors and Awards: 50% Tuition Scholarship

Peking University September 2016 – July 2021
Bachelor of Science in Computer Science, with a specialization in Intelligence Science
Bachelor of Economics
Cumulative GPA: 3.65/4 Computer Science GPA: 3.75/4 Upper-division GPA: 3.82/4
Honors and Awards: Merit Student, Award for Academic Excellence, Zheng Yongxi Scholarship

PUBLICATIONS

- **ACM Symposium on Cloud Computing (SoCC) 2022**
  Haodong Wang, Kuntai Du, Junchen Jiang, "Minimizing Packet Retransmission for Real-time Video Analytics."
- **Machine Learning and Systems (MLSys) 2022**
  Kuntai Du, Qizheng Zhang, Anton Arapin, Haodong Wang, Zhengxu Xia, Junchen Jiang. "AccMPEG: Optimizing Video Encoding for Accurate Video Analytics."
- **IEEE International Conference on Communications (ICC) 2021**
  Haodong Wang, Shuhang Zhang, Boya Di, Lingyang Song. "Cluster-based Handoff Scheme Design for Platoons in Cellular V2X Networks."

RESEARCH EXPERIENCE

Minimizing Packet Retransmission for Real-Time Video Analytics Chicago, IL
Project Leader (with a first-author publication), advised by Prof. Junchen Jiang October 2021 – Now

- Proposed a **transport-layer** scheme to minimize packet retransmission for real-time video analytics applications
- Designed a heuristic to dynamically decide packet retransmission using **application-aware** additional information (leveraging **saliency** values from the **computer vision** community), **conditioned on received packets** during transmission
- Achieved more than 30% reduction in delay compared to TCP with trivial accuracy drop and reduced inaccuracy of UDP from 11% to 2% with a limited delay inflation

Optimizing Video Encoding for Accurate Video Analytics Chicago, IL
Research Assistant (with a co-author publication), advised by Prof. Junchen Jiang June 2021 – September 2021

- Leveraged **macroblock-level accuracy gradients** to optimize regional encoding quality for video analytics
- Extensively tested a **cheap model** (to infer the accuracy gradients) on edge devices (e.g., Raspberry Pi 4 and Nvidia Jetson Nano)
- Achieved 10-43% reduction in delay without hurting accuracy

Platoon Handoff of Smart Robot Cars in Wireless Networks Beijing, China
Project Leader on Future IoT Lab (with a first-author publication), advised by Prof. Lingyang Song February 2020 – April 2021

- Proposed a **cluster-based** platoon handoff protocol to minimize the handoff delay for a platoon of smart robot cars, which can reduce the handoff delay of a platoon with 50 smart robot cars by 15%
- Implemented an **in-door navigation and driving framework** for a platoon of smart robot cars in Wi-Fi networks with 3000+ lines of C/C++, integrating 2D LiDAR for environment detection, Arduino for PID motion control and Raspberry Pi for socket connection and communication
- Presented a **demo video** to demonstrate the handoff delay reduction and won Outstanding Undergraduate Dissertation

TEACHING EXPERIENCE

Teaching assistant, MPCS 51046 (Intermediate Python Programming), University of Chicago Fall 2022
Teaching assistant, MPCS 51044 (C++ for Advanced Programmers), University of Chicago Winter 2022