Zhuqi Li

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RESEARCH INTEREST

My research interests lie in building systems and networking infrastructure for mobile devices and network edge to meet the low latency and high throughput challenge from video applications.

EDUCATION

Princeton University   08/2017 – 01/2023
Ph.D. in Computer Science

Peking University   09/2013 – 07/2017
B.S. in Computer Science, Summa Cum Laude

EXPERIENCES

TikTok   02/2023 – Present
Research Scientist
Working on video upload and codec optimization.

Princeton University   08/2017 – 01/2023
Research Assistant, supervised by **Kyle Jamieson**
Project **LAIA**:
- Designed programmable reflector which provides unprecedented reconfigurability at network physical layer.
- Implemented the system to program wireless channel with a large array of programmable reflectors in real time.
- Achieved improvement on Shannon capacity by 51.4% and TCP throughput by 24%; Paper accepted by NSDI 2019

Project **Dashlet**:
- Implement a web-based short video player based on Dash.js.
- Designed a reverse engineering tool to analyze the behavior and performance of commercial short video apps.
- Designed and implemented playback management algorithm to maximize the quality of experience for short video streaming.

Project **REITS**:
- Designed REITS, a reflective tag to provide enhanced safety for self-driving vehicles.
- Paper accepted by HotMobile 2021, News coverage by BBC, New Scientist

Facebook   06/2021 – 08/2021
SWE Intern, Connectivity lab, supervised by **Alan Wang**
- Designed and implemented a machine learning system to predict the received signal strength on smartphone for 4G/5G network.
- Implemented the corresponding service for upper level applications.

Microsoft Research Redmond   06/2019 – 09/2019
Research Intern, Mobility & Networking Research Group, supervised by **Victor Bahl, Yuanchao Shu** and **Ganesh Ananthanarayanan**
- Design and implement a high throughput, reliable relay network infrastructure using new millimeter wave hardware.
- Build a video streaming and analytic pipeline on top of millimeter wave relay network for dense deployed wireless video surveillance system.
- Paper accepted by ACM/IEEE SEC 2021; Patent published with the number 11272423

Microsoft Research Asia   04/2016 – 06/2017
Research and SWE Intern, Cloud & Mobile Group, supervised by **Yuanchao Shu** and **Thomas Moscibroda**
- Developed PathGuide, a low-cost, plug-and-play indoor navigation application on Google Android Platform (App available at Google Play).
- Designed and implemented intelligent trace-processing and trace-based navigation algorithms for PathGuide.
- Demo paper published in **MobiCom 2017**, **INFOCOM 2019**; Patent published with number 11085772.
- Project was covered by TechCrunch, Reddit, Livemint, Android Police, TechPP, Zhihu, Sohu, Qdaily, NetEase

SELECTED PUBLICATIONS

- Dashlet: Taming Swipe Uncertainty for Robust Short Video Streaming
  Zhuqi Li, Yaxiong Xie, Ravi Netravali, Kyle Jamieson
  USENIX Symposium on Networked Systems Design and Implementation 2023

- Spider: A Multi-Hop Millimeter-Wave Network for Live Video Analytics
  Zhuqi Li, Yuanchao Shu, Ganesh Ananthanarayanan, Longfei Shangguan, Kyle Jamieson, Victor Bahl
  ACM/IEEE Symposium on Edge Computing 2021

- REITS: Reflective Surface for Intelligent Transportation Systems
  Zhuqi Li, Can Wu, Sigurd Wagner, James C. Sturm, Naveen Verma, Kyle Jamieson
  International Workshop on Mobile Computing Systems and Applications 2021

- Towards Programming the Radio Environment with Large Arrays of Inexpensive Antennas
  Zhuqi Li, Yaxiong Xie, Longfei Shangguan, Rotman Ivan Zelaya, Jeremy Gummeson, Wenjun Hu, and Kyle Jamieson
  USENIX Symposium on Networked Systems Design and Implementation 2019

- Incrementally-deployable Indoor Navigation with Automatic Trace Generation
  Yuanchao Shu*, **Zhuqi Li***, Börje F. Karlsson, Yiyong Lin, Thomas Moscibroda, and Kang G. Shin (* co-primary)
  IEEE International Conference on Computer Communications 2019

- Mobile Social Big Data: WeChat Moments Dataset, Network Applications, and Opportunities
  Yuanxing Zhang, **Zhuqi Li**, Chengliang Gao, Kaigui Bian, Lingyang Song, Shaoling Dong, Xiaoming Li
  IEEE Network 2018

- Population Distribution Projection by Modeling Geo Homophily in Online Social Networks
  Yuanxing Zhang, **Zhuqi Li**, Kaigui Bian, Yichong Bai, Zhi Yang, and Xiaoming Li
  *ICCSE 2017 (**Best Paper Award**).*

AWARDS AND HONORS

GetMobile Research Highlights	2019
Princeton Graduate Student Fellowship, Princeton University	2017
Excellence Award of Stars of Tomorrow Internship Program, Microsoft Research	2016 & 2017
ICCSE Best Paper Award (1 out of 24 accepted papers)	2017
Top Ten Undergraduate Dissertation Award, School of EECS, Peking University (10 out of 330)	2017
Founder Scholarship, Peking University (top 3%)	2016
Pacemaker to Merit Student, Peking University (top 2%)	2016
Lee Wai Wing Scholarship, Peking University (top 3%)	2015
First rank in Mathematical Contest in Modeling, Peking University (1 out of 105)	2015
First rank in the Artificial Intelligence Tournament, School of EECS, Peking University (1 out of 60)	2014

SERVICES

Shadow Program Committee, ACM SenSys	2022
Web/Registration Chair, ACM HotNets	2019
Reviewer, IEEE/ACM Transactions on Networking	2019
Reviewer, IEEE Transactions on Vehicular Technology	2019
Reviewer, IEEE Journal on Selected Areas in Communications	2019
Vice President, Association of Chinese Students and Scholars at Princeton University	2018

SKILLS

- **Programming Languages:** C/C++, Python, Java, SQL, HTML, CSS, JavaScript, XML, Go, Dafny, solidity

- **Knowledge:** Linux, Scikit-learn, Torch, Android Programming, Git, Mininet, Latex, SDR, DPDK, Carla

- **Others:** Familiar with data analysis, machine learning, and wireless network