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RESEARCH INTERESTS Data-driven networking with a focus on content delivery network, transport protocols and cloud network.

EDUCATION **Graduate School of Chinese Academy of Sciences**, Beijing, China
Ph.D., Computer Science, Jan 2009
Nankai University, Tianjin, China
B.S., Computer Science, July 2003

ACADEMIC EXPERIENCE **Institute of Computing Tech. (ICT), Chinese Academy of Sciences (CAS)**, Beijing, China
Full Professor Oct. 2017 - present
Associate Professor Oct. 2011 - Sept. 2017
Assistant Professor Feb. 2009 - Sept. 2011

University of Chinese Academy of Sciences, Beijing, China
Adjunct professor Sept. 2015 - present

National ICT Australia (NICTA), Sydney, Australia
Visiting Researcher Sept. 2014 - Sept. 2015

Carnegie Mellon University, PA, USA
Visiting Faculty June 2013 - July 2013

PUBLICATIONS **Book Chapter:**
1. **Zhenyu Li**, Kai Hwang, Gaogang Xie, “Peer-to-Peer Computing and Overlay Networks, Distributed and Cloud Computing”, editors: K. Hwang, G. Fox, and J. Dongarra, Morgan Kaufmann, 2011.10, pp.479-544

Conference papers:

1. Ting Liu, Tianhao Miao, Qinghua Wu, **Zhenyu Li**, Guangxin He, Jiaoren Wu, Xingwu Yang, Gareth Tyson and Gaogang Xie. Demystifying Scaling Performance Bottlenecks in Distributed Deep Learning. **ACM Web Conference (WWW)**, 2022
2. Jinyang Li, **Zhenyu Li**, Qinghua Wu, and Gareth Tyson, “On Uploading Behavior and Optimizations of a Mobile Live Streaming Service”, **IEEE INFOCOM**, 2022
3. Gerui Lv, Qinghua Wu, Weiran Wang, **Zhenyu Li**, and Gaogang Xie, “Lumos: towards Better Video Streaming QoE through Accurate Throughput Prediction”, **IEEE INFOCOM**, 2022
4. Zhiren Zhong, Wei Wang, Yiyang Shao, **Zhenyu Li**, Heng Pan, Hongtao Guan, Gareth Tyson, Gaogang Xie, and Kai Zheng “Muses: Enabling Lightweight Learning-Based Congestion Control for Mobile Devices”, **IEEE INFOCOM**, 2022
5. Zhaohua Wang, **Zhenyu Li**, Guangming Liu, Yunfei Chen, Qinghua Wu, and Gang Cheng, “Examination of WAN Traffic Characteristics in a Large-scale Data Center Network”, **ACM IMC**, 2021

6. Penglai Cui, Heng Pan, **Zhenyu Li**, Jiaoren Wu, Shengzhuo Zhang, Xingwu Yang, Hongtao Guan, and Gaogang Xie, “NetFC: enabling accurate floating-point arithmetic on programmable switches”, **IEEE ICNP**, 2021
7. Jianer Zhou, Xinyi Qiu, **Zhenyu Li**, Gareth Tyson, Qing Li, and Yi Wang, “Antelope: A Framework for Dynamic Selection of Congestion Control Algorithms”, **IEEE ICNP**, 2021
8. Zhilong Zheng, Yunfei Ma, Yanmei Liu, Furong Yang, **Zhenyu Li**, Jiuhai Zhang, Wei Shi, Wentao Chen, Ding Li, Qing An, Hai Hong, Hongqiang Harry Liu, and Ming Zhang, “XLINK: QoE-Driven Multi-Path QUIC Transport in Large-scale Video Services”, **ACM SIGCOMM**, 2021
9. Penghao Zhang, Heng Pan, **Zhenyu Li**, et al, “Accelerating LSH-based Distributed Search with In-network Computation”, **IEEE INFOCOM**, 2021
10. Heng Pan, **Zhenyu Li**, Jianbo Dong, Zheng Cao, Tao Lan, Di Zhang, Gareth Tyson, and Gaogang Xie, “Dissecting the Communication Latency in Distributed Deep Sparse Learning”, **ACM Internet Measurement Conference (IMC)**, 2020
11. Heng Pan, **Zhenyu Li**, Penghao Zhang, Kave Salamatian, and Gaogang Xie, “Misconfiguration Checking for SDN: Data Structure, Theory and Algorithms”, **IEEE Intl. Conference on Network Protocols (ICNP)**, 2020
12. Donghui Yang, **Zhenyu Li**, and Gareth Tyson, “A Deep Dive into DNS Query Failures”, **USENIX Annual Technical Conference (ATC)**, 2020
13. Pengpeng Zhou, Yang Wang, **Zhenyu Li**, Xin Wang, Gareth Tyson, and Gaogang Xie, “LogSayer: Log Pattern-driven Cloud Component Anomaly Diagnosis with Machine Learning”, **IEEE/ACM International Symposium on Quality of Service (IWQoS)**, 2020
14. Zhaohua Wang, **Zhenyu Li**, Minhui Xue, and Gareth Tyson, “Exploring the Eastern Frontier: A First Look at Mobile App Tracking in China”, **Passive and Active Measurement**, 2020
15. Jinyang Li, **Zhenyu Li**, Gareth Tyson, and Gaogang Xie, “Your Privilege Gives Your Privacy Away: An Analysis of a Home Security Camera Service”, **IEEE INFOCOM**, 2020
16. Xi Chen, Minghao Zhao, Xinlei Yang, Zhenhua Li, Yao Liu, **Zhenyu Li**, and Yunhao Liu, “The Cask Effect of Multi-source Content Delivery: Measurement and Mitigation”, **IEEE ICDCS**, 2019
17. Kun Xie, Xiaocan Li, Xin Wang, Gaogang Xie, Dongliang Xie, **Zhenyu Li**, Jigang Wen, Zulong Diao, “Quick and Accurate False Data Detection in Mobile Crowd Sensing”, **IEEE INFOCOM**, 2019
18. Minghao Zhao, Zhenhua Li, Ennan Zhai, Gareth Tyson, Chen Qian, **Zhenyu Li**, Leiyu Zhao, “H2Cloud: Maintaining the Whole Filesystem in an Object Storage Cloud”. The 47th **ICPP**, 2018
19. Jiuxing Su, **Zhenyu Li**, Stephane Grumbach, Kave Salamatian, Gaogang Xie, “Toward Accurate Inference of Web Activities from Passive DNS Data”, **IEEE/ACM IWQoS**, 2018
20. **Zhenyu Li**, Donghui Yang, Zhenhua Li, Chunjing Han, Gaogang Xie, “Content Hosting Infrastructure in China: A View from a Cellular ISP”, **Passive and Active Measurement**, 2018
21. Ennan Zhai, Zhenhua Li, **Zhenyu Li**, Fan Wu, Guihai Chen, Resisting Tag Spam by Leveraging Implicit User Behaviors, **VLDB**, 2017
22. Heng Pan, Gaogang Xie, **Zhenyu Li**, Peng He, Laurent Mathy, “FlowConvertor: Enabling Portability of SDN Applications”, **IEEE INFOCOM**, 2017
23. Yang Wang, **Zhenyu Li**, Gaogang Xie, Kave Salamatian, Enabling Automatic Composition and Verification of Service Function Chain, **IEEE/ACM IWQoS**, 2017
24. **Zhenyu Li**, Xiaohui Wang, Ningjing Huang, Mohamed Ali Kaafar, Zhenhua Li, Jianer Zhou, Gaogang Xie, Peter Steenkiste, “An Empirical Analysis of a Large-scale Mobile Cloud Storage Service”, **ACM IMC**, long paper, 2016

25. Fangzhou Jiang, Zhi Liu, Kanchana Thilakarathna, **Zhenyu Li**, Yusheng Ji, Aruna Seneviratne, “TransFetch: A Viewing Behavior Driven Video Distribution Framework in Public Transport”, **IEEE LCN**, 2016
26. Yang Wang, Gaogang Xie, **Zhenyu Li**, Peng He and Kave Salamatian, “Transparent Flow Migration for NFV”, **IEEE ICNP**, 2016
27. Heng Pan, Gaogang Xie, Peng He, **Zhenyu Li**, Laurent Mathy, “Action Computation for compositional SDN hypervisors”, **IFIP Networking**, 2016
28. Dong Wang, **Zhenyu Li**, Gaogang Xie, Mohamed Ali Kaafar, Kave Salamatian, “Adwords Management for Third-parties in SEM: an Optimisation Model and the Potential of Twitter”, **IEEE INFOCOM**, 2016,
29. Jianer Zhou, Qinghua Wu, **Zhenyu Li**, Steve Uhlig, Peter Steenkiste, Jian Chen, Gaogang Xie, “Demystifying and Mitigating TCP Stalls at the Server Side”, **ACM CoNEXT**, 2015
30. **Zhenyu Li**, Mohamed Ali Kaafar, Kave Salamatian, Gaogang Xie, “User Behavior Characterization of a Large-scale Mobile Live Streaming System”, **ACM WWW-web science track**, 2015,
31. **Zhenyu Li**, Gaogang Xie, Jiali Lin, Yun Jin, Mohamed Ali Kaafar, Kave Salamatian, “On the geographic patterns of a large-scale mobile video-on-demand system”, **IEEE INFOCOM**, 2014,
32. Yonggong Wang, **Zhenyu Li**, Gareth Tyson, Steve Uhlig, Gaogang Xie, “Optimal cache allocation for Content-Centric Networking”, **IEEE ICNP**, 2013,
33. **Zhenyu Li**, Jiali Lin, Marc-Ismael Akodjenou, Gaogang Xie, Mohamed Ali Kaafar, Yun Jin, Gang Peng, “Watching videos from everywhere: a study of the PPTV mobile VoD system”, **ACM IMC**, long paper, 2012,
34. **Zhenyu Li**, Gaogang Xie, Kave Salamatian, “Exploiting Interest Locality for Peer-Assisted Search in UGC Video Systems”, **ICPP**, 2012,
35. Qinghua Wu, **Zhenyu Li**, Jianhua Yang, Gaogang Xie, Kave Salamatian, “Efficient traffic flow measurement for ISP networks”, **IEEE LCN**, 2012,
36. **Zhenyu Li**, Rong Gu, Gaogang Xie, “Measuring and enhancing the social connectivity of UGC video systems: A case study of YouKu”, **IEEE IWQoS**, 2011,
37. **Zhenyu Li**, Gaogang Xie, Zhongcheng Li, “Towards reliable and efficient data dissemination in heterogeneous peer-to-peer systems”, **IEEE IPDPS**, 2008,
38. **Zhenyu Li**, Zengyang Zhu, Gaogang Xie, Zhongcheng Li, “Efficient Multi-source Data Dissemination in Peer-to-Peer Networks”, **IFIP Networking**, 2008,
39. **Zhenyu Li**, Gaogang Xie, Zhongcheng Li, “Locality-Aware Consistency Maintenance for Heterogeneous P2P Systems”, **IEEE IPDPS**, 2007,

Journal articles:

1. Furong Yang, Qinghua Wu, **Zhenyu Li**, Yanmei Liu, Giovanni Pau, and Gaogang Xie, “BBRv2+: Towards Balancing Aggressiveness and Fairness with Delay-based Bandwidth Probing”, **Computer Networks**, 2022
2. Penghao Zhang, Heng Pan, **Zhenyu Li**, Penglai Cui, Ru Jia, Peng He, Zhibin Zhang, Gareth Tyson, and Gaogang Xie, “NetSHa: In-network Acceleration of LSH-based Distributed Search”, **IEEE Transactions on Parallel and Distributed Systems**, 2022
3. Donghui Yang, **Zhenyu Li**, Kave Salamatian, and Gaogang Xie, “Exploiting the Community Structure of Fraudulent Keywords for Fraud Detection in Web Search”, **Journal of Computer Science and Technology**, Oct. 2021

4. Jinyang Li, **Zhenyu Li**, Gareth Tyson, and Gaogang Xie, “Characterising Usage Patterns and Privacy Risks of a Home Security Camera Service”, **IEEE Transactions on Mobile Computing**, Oct. 2021
5. Xiaocan Li, Kun Xie, Xin Wang, Gaogang Xie, Dongliang Xie, **Zhenyu Li**, Jigang Wen, Zulong Diao, and Tian Wang, “Quick and Accurate False Data Detection in Mobile Crowd Sensing,” **IEEE/ACM Transactions on Networking**, 2020
6. Pengpeng Zhou, Yang Wang, **Zhenyu Li**, Gareth Tyson, Hongtao Guan, and Gaogang Xie, “LogChain: Cloud Workflow Reconstruction & Troubleshooting with Unstructured Logs”, **Computer Networks**, 2020
7. Jianmin Liu, Qi Wang, ChenTao He, Katia Jaffres-Runser, Yida Xu, **Zhenyu Li**, and YongJun Xu, “QMR: Q-learning based Multi-objective optimization Routing protocol for Flying Ad Hoc Networks”, **Computer Communications**, 2020
8. Jianer Zhou, **Zhenyu Li**, Qinghua Wu, Peter Steenkiste, Steve Uhlig, Jun Li, and Gaogang Xie, “TCP Stalls at the Server Side: Measurement and Mitigation”, **IEEE/ACM Transactions on Networking**, 2019
9. Jingxiu Su, **Zhenyu Li**, Stephane Grumbach, Muhammad Ikram, Kave Salamatian, and Gaogang Xie, “A Cartography of Web Tracking using DNS Records”, **Computer Communications**, accepted to appear, 2018
10. Zhenhua Li, Yongfeng Zhang, Yunhao Liu, Tianyin Xu, Ennan Zhai, Yao Liu, Xiaobo Ma, **Zhenyu Li**, “A Quantitative and Comparative Study of Network-level Efficiency for Cloud Storage Services”, **ACM Transactions on Modeling and Performance Evaluation of Computing Systems (TOMPECS)**, 2018.
11. Heng Pan, Zhenyu Li, Gaogang Xie, Peng He, Hongtao Guan, Laurent Mathy, “Efficient Action Computation for Compositional SDN Policies”, **IEEE Transactions on Network and Service Management**, 2018
12. Gaogang Xie, **Zhenyu Li**, Mohamed-Ali Kaafar, Qinghua Wu, “Access Types Effect on Internet Video Services and Its Implications on CDN Caching”, **IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)**, 2017
13. Qinghua Wu, **Zhenyu Li**, Gareth Tyson, Steve Uhlig, Mohamed-Ali Kaafar and Gaogang Xie, “Privacy-aware Multipath Video Caching for Content-Centric Networks”, **IEEE Journal on Selected Areas in Communications (JSAC)**, 2016 (The first two authors contributed equally to this work.)
14. **Zhenyu Li**, Mohamed-Ali Kaafar, Kave Salamatian and Gaogang Xie, “Characterizing and Modeling User Behavior in a Large-scale Mobile Live Streaming System”, **IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)**, 2016
15. **Zhenyu Li**, Mohamed-Ali Kaafar, and Gaogang Xie, “Session throughput prediction for Internet videos”, **IEEE Communications magazine**, Nov. 2016
16. Yonggong Wang, **Zhenyu Li**, Gareth Tyson, Steve Uhlig, Gaogang Xie, “Design and Evaluation of the Optimal Cache Allocation for Content-Centric Networking”, **IEEE Transactions on Computers**, 2016,
17. **Zhenyu Li**, Qinghua Wu, Kave Salamatian, Gaogang Xie, “Video Delivery Performance of a Large-Scale VoD System and the Implications on Content Delivery”, **IEEE Transactions on Multimedia**, 2015,
18. Qinghua Wu, **Zhenyu Li**, Jianer Zhou, Heng Jiang, Zhiyang Hu, Yunjie Liu, Gaogang Xie, “SOFIA: toward service-oriented information centric networking”, **IEEE Network**, 2014
19. **Zhenyu Li**, Jiali Lin, Kave Salamatian, Gaogang Xie, “Social Connections in User-Generated Content Video Systems: Analysis and Recommendation”, **IEEE Transactions on Network and Service Management**, 2013

20. Jiali Lin, **Zhenyu Li**, Gaogang Xie, Yi Sun, Kave Salamatian, Wenjie Wang, “Mobile video popularity distributions and the potential of peer-assisted video delivery”, **IEEE Communications Magazine**, 2013
21. Yi Sun, Yang Guo, **Zhenyu Li**, Jiali Lin, Gaogang Xie, Xiaobing Zhang, Kave Salamatian, “The case for P2P mobile video system over wireless broadband networks: A practical study of challenges for a mobile video provider”, **IEEE Network**, 2013
22. Chunjing Han, **Zhenyu Li**, Gaogang Xie, Steve Uhlig, Yulei Wu, Liangxiong Li, Jingguo Ge, Yunjie Liu, “Insights into the issue in IPv6 adoption: A view from the Chinese IPv6 Application mix”, **Concurrency and Computation: Practice and Experience**, 2014
23. **Zhenyu Li**, Gaogang Xie, Kai Hwang, Zhongcheng Li, “Churn-Resilient Protocol for Massive Data Dissemination in P2P Networks”, **IEEE Transactions on Parallel and Distributed Systems**, 2011,
24. Gaogang Xie, Peng He, Hongtao Guan, **Zhenyu Li**, Yingke Xie, Layong Luo, Jianhua Zhang, Yonggong Wang, Kave Salamatian, “PEARL: a programmable virtual router platform”, **IEEE Communications Magazine**, 2011
25. **Zhenyu Li**, Zengyang Zhu, Gaogang Xie, Zhongcheng Li, “Fast and proximity-aware multi-source overlay multicast under heterogeneous environment”, **Computer Communications**, 2009
26. **Zhenyu Li**, Gaogang Xie, Zhongcheng Li, “Efficient and Scalable Consistency Maintenance for Heterogeneous Peer-to-Peer Systems”, **IEEE Transactions on Parallel and Distributed Systems**, 2008,

HONORS AND AWARDS

Distinguished Young Scholar in Beijing (supported by Beijing NSF), 2020
 IEEE INFOCOM 2020 Distinguished TPC Award, 2020
 Excellent Member of the Youth Innovation Promotion Association, CAS 2017
 Second Class Award of Technological Invention Award, China Computer Federation, 2013
 Award from Youth Innovation Promotion Association, CAS, 2012
 Excellent Researcher from ICT-CAS, 2010, 2013, 2016
 “100 Starts” Program from ICT-CAS, 2009
 Nomination for “Excellent Ph.D. Thesis of CAS”, 2009

TEACHING

Advanced Computer networks for graduate students of Univ. of CAS since 2015

GRANTS (PI)

Network Architecture and Protocols for 5G/B5G
Distinguished Young Scholar Project, NSF of Beijing, 2021 - 2023

Intent-driven Network Behavior Measurement, Analysis and System
Key Project, NSF of China, 2021 - 2024

AI-based Anomaly Diagnosis and Traffic Prediction for Service Orchestration and Placement in Clouds
CAS-Austria, 2021 - 2023

Large-scale measurement of Network Behavior
National Key R&D Program of China, 2019 - 2022

Future Network Architecture and Protocols

Project for Excellent Member of the Youth Innovation Promotion Association, CAS, 2018 - 2020

Mobile TCP performance analysis and optimisation

NSF of China, 2016 - 2019

Programmable virtualized router for SDN: key technologies and implementation

National High Tech. Research & Development Program of China, 2013 - 2015

Usage patterns characterization of Internet videos

NSF of China, 2013 - 2016

Service-oriented future Internet architecture

National Basic Research Program (973 Program), 2012 - 2016

**PROFESSIONAL
SERVICE**

Guest editor: “Security and Communication Networks” on cyberspace security for future Internet, 2018

Conference TPC member:

- IEEE INFOCOM 2019/2020/2021/2022.
- IEEE ICNP 2019/2020/2022
- IFIP Networking 2021
- ACM SIGCOMM Poster/demo 2019
- ACM ICN Poster/demo 2015/2017
- ACM SIGCOMM AINTEC 2016/2017
- ACM CoNext Student Workshop 2015
- IEEE Conf. IoT 2015

Journal Reviewer:

- IEEE/ACM Trans. on Networking
- IEEE Trans. on Mobile Computing
- IEEE Trans. on Parallel and Distributed Systems
- IEEE Trans. on Circuits and Systems for Video Technology
- IEEE Trans. on Multimedia
- Computer Networks
- IEEE Trans. on Communications
- IEEE Internet Computing
- IEEE Trans. on Network and Service Management
- IEEE Systems Journal