

Dr. Zili Meng

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Hong Kong University of Science and Technology
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Research Interests

Computer network, multimedia streaming, and virtual reality.

Education

- **Ph.D. at Institute for Network Sciences and Cyberspace** **Tsinghua University**
Advisor: Prof. Mingwei Xu. Beijing, China. 2019 – 2023
- **B.Eng. at Department of Electronic Engineering** **Tsinghua University**
Advisor: Prof. Jun Bi (late). Beijing, China. 2015 – 2019

Academic Positions

- **Assistant Professor** **Hong Kong University of Science and Technology**
Department of Electronic and Computer Engineering Jul 2023 – Now

Honors and Awards

- 2023 Outstanding Ph.D. Thesis in Tsinghua University
Outstanding Ph.D. Graduate in Tsinghua University
- 2022 ByteDance Scholar
- 2021 IEEE/ACM IWQoS 2021 Best Paper Award
- 2020 Microsoft Research PhD Fellowship (Asia)
IEEE ICC 2020 Best Paper Award
- 2019 Future Scholar Fellowship (Tsinghua University)
Outstanding Graduate in Tsinghua University
- 2018 ACM SIGCOMM 2018 Student Research Competition Gold Medal
Tsinghua Top Grade Scholarship

Publications

Conference Papers

- 2024 (C15) **Zili Meng**, X. Kong, J. Chen, B. Wang, M. Xu, R. Han, H. Liu, V. Arun, H. Hu, X. Wei, “Hairpin: Rethinking Packet Loss Recovery in Edge-based Interactive Video Streaming”. In *USENIX Symposium on Networked Systems Design and Implementation (NSDI ’24)*. Acceptance rate: 40/227=18%.
- 2023 (C14) **Zili Meng**, T. Wang, Y. Shen, B. Wang, M. Xu, R. Han, H. Liu, V. Arun, H. Hu, X. Wei, “Enabling High Quality Real-Time Communications with Adaptive Frame-Rate”. In *USENIX Symposium on Networked Systems Design and Implementation (NSDI ’23)*. Acceptance rate: 50/272=18%. [**Deployed in Tencent**]
- (C13) J. Zhang, Y. Zhang, E. Dong, Y. Zhang, S. Ren, **Zili Meng**, M. Xu, X. Li, Z. Hou, Z.g Yang, X. Fu, “Bridging the Gap between QoE and QoS in Congestion Control: A Large-scale Mobile Web Service Perspective”. In *USENIX Annual Technical Conference (ATC ’23)*. Acceptance rate: 65/353=18%. [**Deployed in Meituan**]
- 2022 (C12) **Zili Meng**, Y. Guo, C. Sun, B. Wang, J. Sherry, H. Liu, M. Xu, “Achieving Consistent Low Latency for Wireless Real-Time Communications with the Shortest Control Loop”. In *ACM SIGCOMM Conference (SIGCOMM ’22)*. Acceptance rate: 55/279=19%. [**Covered by APNIC**]
- (C11) C. Miao, M. Chen, A. Gupta, **Zili Meng**, L. Ye, J. Xiao, J. Chen, Z. He, X. Luo, J. Wang, H. Yu. “Detecting Ephemeral Optical Events with OpTel”. In *USENIX Symposium on Networked Systems Design and Implementation (NSDI ’22)*. Acceptance rate: 78/402=19%.

- 2021 (C10) J. Zhang, E. Dong, **Zili Meng**, Y. Yang, M. Xu, S. Yang, M. Zhang, Y. Yue, “WiseTrans: Adaptive Transport Protocol Selection for Mobile Web Service”, In *The Web Conference (WWW ’21)*. Acceptance rate: 357/1736=20%. [Deployed in Baidu]
- (C9) X. Chen, Q. Huang, P. Wang, **Zili Meng**, H. Liu, Y. Chen, D. Zhang, H. Zhou, B. Zhou, C. Wu, “LightNF: Simplifying Network Function Offloading in Programmable Networks”, In *IEEE/ACM International Symposium on Quality of Service (IWQoS ’21)*. Acceptance rate: 64/256=25%. [Best Paper Award]
- (C8) J. Chen, **Zili Meng**, Y. Guo, M. Xu, H. Hu, “HierTopo: Towards High-Performance and Efficient Topology Optimization for Dynamic Networks”, In *IEEE/ACM International Symposium on Quality of Service (IWQoS ’21)*. Acceptance rate: 64/256=25%.
- 2020 (C7) **Zili Meng**, M. Wang, J. Bai, M. Xu, H. Mao, H. Hu, “Interpreting Deep Learning-Based Networking Systems”. In *ACM SIGCOMM Conference (SIGCOMM ’20)*. Acceptance rate: 53/250=21%.
- (C6) S. Wang, C. Sun, **Zili Meng**, M. Wang, J. Cao, M. Xu, J. Bi, Q. Huang, M. Moshref, T. Yang, H. Hu, G. Zhang, “Martini: Bridging the Gap between Network Measurement and Control Using Switching ASICs”, In *IEEE International Conference on Network Protocols (ICNP ’20)*. Acceptance rate: 31/184=16%.
- (C5) S. Wang, **Zili Meng**, C. Sun, M. Wang, M. Xu, J. Bi, T. Yang, Q. Huang, H. Hu, “SmartChain: Enabling High-Performance Service Chain Partition between SmartNIC and CPU”, In *IEEE International Conference on Communications (ICC ’20)*. [Best Paper Award]
- 2019 (C4) **Zili Meng**, J. Chen, Y. Guo, C. Sun, H. Hu, M. Xu, “PiTree: Practically Implementing ABR Algorithms Using Decision Trees”. In *ACM International Conference on Multimedia (MM ’19)*. Acceptance rate: 248/936=26%. [Oral Paper (88/936=9.4%)] [Deployed in Tencent]
- (C3) H. Mao, M. Schwarzkopf, S. Venkatakrisnan, **Zili Meng**, M. Alizadeh, “Learning Graph-based Cluster Scheduling Algorithms”. In *ACM SIGCOMM Conference (SIGCOMM ’19)*. Acceptance rate: 32/221=14%.
- 2018 (C2) **Zili Meng**, J. Bi, H. Wang, C. Sun, H. Hu, “CoCo: Compact and Optimized Consolidation of Modularized Service Chains in NFV”, In *IEEE International Conference on Communications (ICC 2018)*, Kansas City, MO, USA, May 20-24, 2018.
- (C1) C. Sun, J. Bi, **Zili Meng**, X. Zhang, H. Hu, “OFM: Optimized Flow Migration for NFV Elasticity Control”, In *IEEE/ACM International Symposium on Quality of Service (IWQoS 2018)*, Banff, Alberta, Canada, June 4-6, 2018.

Journal Papers

- 2023 (J5) J. Zhang, S. Ren, E. Dong, **Zili Meng**, Y. Yang, M. Xu, S. Yang, M. Zhang, Y. Yue. “Reducing Mobile Web Latency through Adaptively Selecting Transport Protocol”, *IEEE/ACM Transactions on Networkings (ToN)*, 2023.
- 2022 (J4) X. Chen, D. Zhang, Q. Huang, **Zili Meng**, H. Liu, H. Zhou, C. Wu, Q. Yang. “Automatic Performance-Optimal Offloading of Network Functions on Programmable Switches”, *IEEE Transactions on Cloud Computing*, 2022.
- 2021 (J3) **Zili Meng**, Y. Guo, Y. Shen, J. Chen, C. Zhou, M. Wang, J. Zhang, M. Xu, C. Sun, H. Hu. “Practically Deploying Heavyweight Adaptive Bitrate Algorithms With Teacher-Student Learning”, *IEEE/ACM Transactions on Networkings (ToN)*, 2021.
- 2019 (J2) **Zili Meng**, J. Bi, H. Wang, C. Sun, H. Hu. “MicroNF: An Efficient Framework for Enabling Modularized Service Chains in NFV”, *IEEE Journal on Selected Areas in Communications (JSAC)*, 2019.
- 2018 (J1) C. Sun, J. Bi, **Zili Meng**, T. Yang, X. Zhang, H. Hu. “Enabling NFV Elasticity Control with Optimized Flow Migration”, *IEEE Journal on Selected Areas in Communications (JSAC)*, 2018.

Selected Workshop/Poster/Demo Papers

- 2021 (O6) T. Wang, **Zili Meng**, M. Xu, R. Han, H. Liu, “Enabling High Frame-rate UHD Real-time Communication with Frame-Skipping”, In *ACM MobiCom Workshop on Hot Topics in Video Analytics and Intelligent Edges (HotEdgeVideo ’21)*, co-located with MobiCom ’21.
- (O5) Y. Shen, **Zili Meng**, J. Chen, M. Xu, “Quantifying the Transient Performance of Congestion Control Algorithms”, In *ACM SIGCOMM Conference (SIGCOMM ’21)*, poster paper.
- (O4) J. Chen, **Zili Meng**, M. Xu, “Physical-Layer Informed Multipath Redundancy Optimization for Mobile Real-Time Communication”, In *Asia-Pacific Workshop on Networking (APNet ’21)*, poster paper.
- (O3) Y. Guo, J. Chen, **Zili Meng**, M. Xu, “Towards Optimization for Large-scale Earth Observation Missions from a Global Perspective”, In *Asia-Pacific Workshop on Networking (APNet ’21)*, poster paper.

- 2018 (O2) **Zili Meng**, J. Bi, C. Sun, S. Wang, M. Wang, H. Hu, “PAM: When Overloaded, Push Your Neighbor Aside!”, In *ACM SIGCOMM Conference (SIGCOMM ’18)*, poster paper. [SIGCOMM ’18 SRC Gold Medal (the 1st place)]
- (O1) Z. Zheng, J. Bi, C. Sun, H. Yu, H. Hu, **Zili Meng**, S. Wang, K. Gao, J. Wu, “GEN: A GPU-Accelerated Elastic Framework for NFV”, In *Asia-Pacific Workshop on Networking (APNet ’18)*.

Granted Patents

- 2022 (P4) M. Xu, **Zili Meng**, M. Wang, J. Bai. *An Interpretation Method for Deep Learning-Based Global Networked Systems*. CN111753892A, Chinese Patent. Granted: September 9, 2022.
- (P3) Z. Ruan, **Zili Meng**, Y. Huang. *A Scheduling Method, Device, and Electronic Equipment*. CN113872887A, Chinese Patent. Granted: August 16, 2022.
- 2021 (P2) M. Xu, J. Zhang, E. Dong, **Zili Meng**, Y. Yang. *Adaptive Transport Protocol Selection Method and Device for Mobile Web Service*. CN112583818A, Chinese Patent. Granted: December 24, 2021.
- 2020 (P1) M. Xu, **Zili Meng**, J. Chen, Y. Guo, C. Sun. *Video Playing Method, Video Player and Computer Storage Medium*. CN110784760A, Chinese Patent. Granted: August 21, 2020.

Experiences

Research

- Research Assistant** **Carnegie Mellon University**
Computer Science Department, School of Computer Science *Feb 2022 – Dec 2022*
 Advisor: Prof. Justine Sherry. Pittsburgh, PA, USA.
- Research Assistant** **Massachusetts Institute of Technology**
Computer Science and Artificial Intelligence Laboratory *Jun 2018 – Sep 2018*
 Advisor: Prof. Mohammad Alizadeh. Cambridge, MA, USA.

Employment

- Research Intern** **Alibaba**
XG Laboratory, Damo Academy *Aug 2021 – Jan 2022*
 Mentor: Dr. Chen Sun. Beijing, China.
- Research Intern** **JLSemi**
Network ASIC Team *Jun 2021 – Aug 2021*
 Mentor: Mr. Zhaosong Ruan. Nanjing, China.
- Research Intern** **Tencent**
START Cloud Game Team *Jun 2020 – Sep 2020*
 Mentor: Mr. Rui Han. Shenzhen, China.

Services

Program Committee Member

- ACM SIGCOMM Posters and Demos 2023.
- ACM SIGCOMM Workshop on Emerging Multimedia Systems 2023.
- Passive and Active Measurement (PAM) 2022.
- ACM Student in MobiSys Workshop (SMS) 2021 (co-located with MobiSys 2021).

Journal Reviewer

- IEEE/ACM Transactions on Networking (**ToN**) (2023)
- Springer Multimedia Systems (2022).
- Elsevier Computer Networks (2019 – 2022).
- IEEE Transactions on Network and Service Management (**TNSM**) (2018, 2019).

Artifact Evaluation Committee, ACM SIGCOMM 2021, USENIX OSDI 2021, EuroSys 2021, USENIX OSDI 2020.

Teaching and Mentoring

Teaching Experience.....

- **Instructor, Computer Networks (ELEC3120)** **HKUST**
Fall 2023
Hong Kong, China.
- **Teaching Assistant, Networking and the Internet (15-441/641)** **Carnegie Mellon University**
Fall 2022
Pittsburgh, PA, USA. Instructor: Prof. Justine Sherry.

Impact

Industrial Impact.....

- Floo (ATC '23)** *Meituan uses my congestion control selection mechanism for mobile Web service (Dianping App).*
- AFR (NSDI '23)** *Tencent uses my frame-rate adaptation algorithm for cloud gaming transport (START Cloud Gaming).*
- Zhuge (SIGCOMM '22)** *Alibaba is proposing new products in their cloud PC (Wuying Cloud Desktop) with my feedback mechanism.*
- WiseTrans (WWW '21)** *Baidu uses my protocol selection mechanism between TCP and QUIC for their video streaming service (Haokan Video).*
- PiTree (MM '19)** *Tencent uses my bit-rate adaptation algorithm in their video streaming service (Tencent Video). Kuaishou also uses a similar algorithm for live video uploads.*

News Coverage.....

- Zhuge (SIGCOMM '22)** [APNIC Blog](#), [China.com.cn](#), [Alibaba Cloud News](#).
- Metis (SIGCOMM '20)** [BNRist News](#).
- Decima (SIGCOMM '19)** [MIT News](#), [CACM](#), [Tech Xplore](#), [Computer Business Review](#), [Science Blog](#), [Network World](#), [Notizie Scientifiche](#).

Last updated: September 6, 2023.