

Ming Tang

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Research Interests

- Mobile edge computing; federated learning; mobile video streaming and live streaming

Education

- **The Chinese University of Hong Kong** Aug. 2014 - Sep. 2018
Ph.D., Department of Information Engineering
Advisor: Prof. Jianwei Huang
- **Stanford University** Sep. 2017 - Feb. 2018
Visiting Student, Department of Management Science and Engineering
Advisor: Prof. Ramesh Johari
- **Sichuan University** Sep. 2010 - Jun. 2014
B.E., Department of Electronics and Information Engineering
Best Undergraduate Thesis Award, Outstanding Graduates Award
GPA: 91.04/100, Rank: 4/244

Work Experience

- **Southern University of Science and Technology** Dec. 2023 - Present
Associate Professor, Department of Computer Science and Engineering
- **Southern University of Science and Technology** Feb. 2022 - Dec. 2023
Assistant Professor, Department of Computer Science and Engineering
- **The University of British Columbia** Nov. 2018 - Jan. 2022
Postdoc, Department of Electrical and Computer Engineering
Advisor: Prof. Vincent W.S. Wong

Publications

- Book Chapter
 1. **M. Tang** and V. W.S. Wong, "Deep Reinforcement Learning for Mobile Edge Computing Systems," *Broadband Communications, Computing, and Control for Ubiquitous Intelligence*, Edited by L. Cai, B.L. Mark, J. Pan, Springer International Publishing, 2022.
- Journal Publications
 1. **M. Tang**, F. Peng, and V.W.S. Wong, "A Blockchain-Empowered Incentive Mechanism for Cross-Silo Federated Learning," *IEEE Transactions on Mobile Computing*, Feb. 2024 (Early Access).
 2. C. Huang, **M. Tang**, Q. Ma, J. Huang, and X. Liu, "Promoting Collaborations in Cross-Silo Federated Learning: Challenges and Opportunities" *IEEE Communications Magazine*, Dec. 2023 (Early Access).
 3. H. Pan, Y. Zhou, T. -T. Chan, **M. Tang**, J. Li, and Z. Du, "Improving Information Freshness via Backbone-Assisted Cooperative Access Points," *IEEE Internet of Things Journal*, vol. 10, no. 5, Mar. 2023.
 4. **M. Tang** and V. W.S. Wong, "Online Bitrate Selection for Viewport Adaptive 360-Degree Video Streaming," *IEEE Transactions on Mobile Computing (TMC)*, vol. 21, no. 7, Jul. 2022.

5. **M. Tang** and V. W.S. Wong, "Deep Reinforcement Learning for Task Offloading in Mobile Edge Computing Systems," *IEEE Transactions on Mobile Computing (TMC)*, vol.21, no. 6, Jun. 2022. (*ESI Highly Cited Paper, 2022 Best Paper Award from IEEE TMC*)
6. **M. Tang** and J. Huang, "How Do You Earn Money on Live Streaming Platforms? A Study of Donation-Based Markets," *IEEE/ACM Transactions on Networking (ToN)*, vol. 29, no. 4, Aug. 2021.
7. **M. Tang**, L. Gao, and J. Huang, "Communication, Computation, and Caching Resource Sharing for Internet-of-Things," *IEEE Communications Magazine*, vol. 58, no. 4, pp. 75-80, Apr. 2020.
8. **M. Tang**, L. Gao, and J. Huang, "Enabling Edge Cooperation in Tactile Internet via 3C Resource Sharing," *IEEE Journal on Selected Areas in Communications (JSAC)*, vol. 36, no. 11, pp. 2444-2454, Nov. 2018.
9. **M. Tang**, H. Pang, S. Wang, L. Gao, J. Huang, and L. Sun, "Multi-Dimensional Auction Mechanisms for Crowdsourced Mobile Video Streaming," *IEEE/ACM Transactions on Networking (ToN)*, vol. 26, no. 5, pp. 2062-2075, Oct. 2018.
10. L. Gao, **M. Tang**, H. Pang, J. Huang, and L. Sun, "Multi-User Cooperative Mobile Video Streaming: Performance Analysis and Online Mechanism Design," *IEEE Transactions on Mobile Computing (TMC)*, vol. 18, no. 2, pp. 376-389, Feb. 2018.
11. **M. Tang**, L. Gao, H. Pang, J. Huang and L. Sun, "Optimizations and Economics of Crowdsourced Mobile Streaming," *IEEE Communications Magazine*, vol. 55, no. 4, pp. 21 - 27, Apr. 2017.

- Conference Publications

1. Shuo Wang, Bing Luo, **Ming Tang** , "Tackling System-Induced Bias in Federated Learning: A Pricing-based Incentive Mechanism," *Proc. IEEE ICDCS*, Jul. 2024.
2. Haoyu Wang, Yiyu Liu, Chunhui Xu, Xing Liu, **Ming Tang** , "Non-Linear Coded Computation for Distributed CNN Inference: A Learning-based Approach," *Proc. IEEE ICDCS Tech4Goods Workshop*, Jul. 2024.
3. Chen Huang, Zhiyuan Wang, **Ming Tang**, "Self-Interested Load Announcement by Edge Servers: Overreport or Underreport?" *Proc. INFOCOM ICCN Workshop*, May 2024.
4. Lyudong Jin*, **Ming Tang***, Meng Zhang, and Hao Wang, "Fractional Deep Reinforcement Learning for Age-Minimal Mobile Edge Computing," *Proc. AAAI Conference on Artificial Intelligence*, Feb. 2024.
5. Yizhou Yan, Xinyu Tang, Chao Huang, and **Ming Tang**, "Price of Stability in Quality-Aware Federated Learning," *Proc. IEEE Global Communications Conference (GLOBECOM)*, 2023.
6. Yanqing Lu, Meng Zhang, and **Ming Tang***, "Caching for Edge Inference at Scale: A Mean Field Multi-Agent Reinforcement Learning Approach," *Proc. IEEE Global Communications Conference (GLOBECOM)*, 2023.
7. Chuiyang Meng, **Ming Tang**, Mehdi Setayesh, and Vincent W.S. Wong, "GNN-based Neighbor Selection and Resource Allocation for Decentralized Federated Learning," *Proc. IEEE Global Communications Conference (GLOBECOM)*, 2023.
8. Ning Yang, Junrui Wen, Meng Zhang, and **Ming Tang**, "Multi-objective Deep Reinforcement Learning for Mobile Edge Computing," *Proc. The International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless (WiOpt)*, 2023.
9. **M. Tang** and V. W.S. Wong, "Tackling System Induced Bias in Federated Learning: Stratification and Convergence Analysis," *Proc. IEEE International Conference on Computer Communications (INFOCOM)*, May 2023.
10. **M. Tang** and V. W.S. Wong, "An Incentive Mechanism for Cross-Silo Federated Learning: A Public Goods Perspective," *Proc. IEEE International Conference on Computer Communications (INFOCOM)*, May 2021.

11. **M. Tang** and J. Huang, "How to Earn Money in Live Streaming Platforms?—A Study of Donation-Based Markets," *Proc. IEEE International Conference on Computer Communications (INFOCOM)*, Paris, France, Apr. 2019.
12. **M. Tang**, S. Wang, L. Gao, J. Huang and L. Sun, "MOMD: A Multi-Object Multi-Dimensional Auction for Crowdsourced Mobile Video Streaming," *Proc. IEEE International Conference on Computer Communications (INFOCOM)*, Atlanta, GA, May 2017.
13. **M. Tang**, L. Gao, and J. Huang, "A General Framework for Crowdsourcing Mobile Communication, Computation, and Caching," *Proc. IEEE Global Communications Conference (GLOBECOM)*, Singapore, Singapore, Dec. 2017.
14. **M. Tang**, L. Gao, H. Pang, J. Huang and L. Sun, "A Multi-Dimensional Auction Mechanism for Mobile Crowdsourced Video Streaming," *Proc. The International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless (WiOpt)*, Tempe, AZ, May, 2016.
15. L. Gao, **M. Tang**, H. Pang, J. Huang, and L. Sun, "Performance Bound Analysis for Crowdsourced Mobile Video Streaming," *Proc. Conference on Information Systems and Sciences (CISS)*, Princeton, NJ, Mar. 2016.
16. H. Pang, P. Wang, L. Gao, **M. Tang**, J. Huang and L. Sun, "Crowdsourced Mobility Prediction Based on Spatio-Temporal Contexts," *Proc. IEEE International Conference on Communications (ICC)*, Kuala Lumpur, Malaysia, May 2016.

- Patent

1. Lifeng Sun, Shou Wang, **Ming Tang**, Lin Gao, and Jianwei Huang, "End-to-end peer video assistance transmission method", CN patent No.105898550B, March 2019

Presentation

- Invited talk "Deep Reinforcement Learning for Task Offloading in Mobile Edge Systems" at IEEE SECON Workshop on the Economics of Fog, Edge and Cloud Computing, Sep. 2022.

Teaching

- **Lecturer**, Dept. of Computer Science and Engineering, Southern University of Science and Technology
 - CS 201 Discrete Mathematics for Computer Science (Spring 2022, Spring 2023, Spring 2024)
 - CS 305 Computer Networking (Fall 2022, Fall 2023)
- **Guest Lecturer**, Dept. of Electrical and Computer Engineering, The University of British Columbia
 - EECE 571G Blockchain Software Engineering (Spring 2020): Game Theory Fundamentals

Research Grant

- Principle Investigator , "Mobile edge computing-based hierarchical cross-silo federated learning framework" (reference number 62202214), The Young Scientists Fund of the National Natural Science Foundation of China, 01/2023 - 12/2025, RMB 300,000.
- Principle Investigator , "Federated learning framework for time-varying data" (reference number 2023A151512819), Natural Science Foundation of Guangdong, 01/2023 - 12/2025, RMB 100,000.

Awards

- **2022 Best Paper Award from IEEE Transactions on Mobile Computing**, IEEE Computer Society Publications Board, Dec. 2023

- **Global Scholarship Programme for Research Excellence**, CUHK, 2017-2018
- **Overseas Research Attachment Programme**, Faculty of Engineering, CUHK, 2017-2018
- **Best-in-Session Presentation Award**, IEEE INFOCOM, 2017
- **Student Travel Grant**, IEEE Communications Society for attending IEEE INFOCOM, 2017
- **Best Student Presentation Award**, Network Communications and Economics Lab, CUHK, 2017
- **Hong Kong PhD Fellowship**, Hong Kong, 2014-2017
- **Outstanding Graduates Award** and **Best Undergraduate Thesis Award**, Sichuan University, 2014
- **Model Student Award** (top 30 students in the university), Sichuan University, 2012
- **National Scholarship** (ranking 1/328), China, 2011

Academic Services

- **Associate Editor**
 - IEEE Open Journal of the Communications Society
 - IEEE Internet of Things Journal
- **Executive Member**
 - CCF Computational Economics
- **Technical Program Committee (TPC) Members**
 - IEEE Global Communications Conference (GLOBECOM)
 - IEEE International Conference on Distributed Computing Systems (ICDCS)
 - IEEE International Conference on Communications (ICC)
 - IEEE Wireless Communications and Networking Conference (WCNC)
 - IEEE 5G World Forum (5GWF)
 - International Teletraffic Congress (ITC)
- **Technical Reviewers**
 - IEEE Transactions on Mobile Computing (TMC)
 - IEEE Journal on Selected Areas in Communications (JSAC)
 - IEEE Transactions on Big Data (TBD)
 - IEEE Transactions on Communications (TCOM)
 - IEEE Internet of Things Journal (IoT)
 - IEEE Transactions on Vehicular Technology (TVT)
 - Frontiers in Communications and Networks
 - IEEE International Conference on Computer Communications (INFOCOM)
 - IEEE Wireless Communications and Networking Conference (WCNC)
 - International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt)
 - IEEE International Conference on Communications (ICC)