

Haoyue Tang

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<https://loveisbasa.github.io/thy.github.io/index.html>

Employment

Meta AI (Facebook Applied AI Research), Sunnyvale, CA, USA

Postdoctoral Associate, 2023.04-Now

Solving Image Inverse Problems via Policy Gradient (submitted to AISTATS2024, short version to appear NeurIPS2023 Workshop)

Yale University, NSF AI Institute for Edge Computing Leveraging Next Generation Networks

Postdoctoral Research Associate, 2022.01-2023.04

Online Learning for Data Freshness Optimization in Networking Systems (Mobihoc 2022, IEEE Trans on Information Theory, IEEE Trans on Networking)

Microsoft Research, Beijing, China

Research Intern, “Stars of Tomorrow”, 2020.11-2021.11

Improve out-of-distribution and transfer learning accuracy using causal learning (NeurIPS 2021)

Develop new dual generation models using joint probability compatibility (NeurIPS 2021)

Education

Tsinghua University, Beijing, China

Ph.D.(with honors), Department of Electrical Engineering, 2017 to 2021

B.S., Electrical Engineering, 2013-2017

Research on wireless networking, with emphasis on data freshness oriented scheduling, online learning and mechanism design.

Research Interest

My research lies in the broad area of information theory, stochastic optimization and applied probabilities, with applications in communication networks, statistical learning and generative models. My research efforts have been recently dedicated to generative models and time-sensitive networking.

Publication¹

Citations

Total number of citations is 429, the most cited publication has 118 citations (source: Google Scholar on 24/11/2023)

¹(* indicates students working on projects with me)

Preprints

1. **H. Tang**, T. Xie, A. Feng, H. Wang, C. Zhang and Y. Bai, "Solving Inverse Problems via Posterior Sampling: A Policy Gradient Viewpoint", submitted to AISTATS 2024.

Refereed Journal Articles

2. **H. Tang**, Y. Sun, and L. Tassiulas, "Sampling of the Wiener Process for Remote Estimation over a Channel with Unknown Delay Statistics", accepted, *IEEE Transactions on Networking*.
3. Y. Chen*, **H. Tang**, J. Wang, P. Yang and L. Tassiulas, "Sampling for Remote Estimation of an Ornstein-Uhlenbeck Process through Channel with Unknown Delay Statistics", accepted, *Journal of Communications and Networks*.
4. S. Yang, L. Li, **H. Tang** and J. Wang, "Tradeoff between Diversity and Multiplexing Gains in Block Fading Optical Wireless Channels," in *IEEE Transactions on Information Theory*, vol. 69, no. 6, pp. 3415-3430, June 2023.
5. **H. Tang**, Y. Chen, J. Wang, P. Yang and L. Tassiulas, "Age Optimal Sampling Under Unknown Delay Statistics," in *IEEE Transactions on Information Theory*, vol. 69, no. 2, pp. 1295-1314, Feb. 2023.
6. Y. Chen*, **H. Tang**, J. Wang, and J. Song, "Optimizing Age Penalty in Time-Varying Networks with Markovian and Error-Prone Channel State," *Entropy*, vol. 23, no. 1, p. 91, Jan. 2021.
7. **H. Tang**, J. Wang, L. Song and J. Song, "Minimizing Age of Information With Power Constraints: Multi-User Opportunistic Scheduling in Multi-State Time-Varying Channels," in *IEEE Journal on Selected Areas in Communications*, vol. 38, no. 5, pp. 854-868, May 2020.
8. **H. Tang**, J. Wang, Z. Tang and J. Song, "Scheduling to Minimize Age of Synchronization in Wireless Broadcast Networks With Random Updates," in *IEEE Transactions on Wireless Communications*, vol. 19, no. 6, pp. 4023-4037, June 2020.
9. **H. Tang**, J. Wang and L. He, "Off-Grid Sparse Bayesian Learning-Based Channel Estimation for MmWave Massive MIMO Uplink," in *IEEE Wireless Communications Letters*, vol. 8, no. 1, pp. 45-48, Feb. 2019.

Refereed Conference Articles

10. C. Zheng, **H. Tang**, M. Zang, X. Hong, A. Feng, L. Tassiulas and N. Zilberman, "DINC: toward distributed in-network computing", CoNEXT 2023.
11. **H. Tang**, T. Xie, A. Feng, H. Wang, C. Zhang and Y. Bai, "Solving Inverse Problems via Posterior Sampling: A Policy Gradient Viewpoint", accepted 2023 NeurIPS workshop on Deep Learning for Differential Equations (DLDE)
12. H. He*, **H. Tang**, J. Pan, J. Wang, J. Song and L. Tassiulas, "Age optimal sampling for unreliable channels under unknown channel statistics", accepted, WiOPT2023 workshop on Semantic Communications.
13. **H. Tang**, Y. Sun, and L. Tassiulas, "Sampling of the Wiener Process for Remote Estimation over a Channel with Unknown Delay Statistics", In *the Twenty-second International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing (MobiHoc '22)*, October 17–20, 2022, Seoul, Republic of Korea. ACM, New York, NY, USA. (Acceptance rate: 24/160=15%)
14. **H. Tang**, Y. Chen, J. Wang, J. Sun and J. Song, "Sending Timely Status Updates through Channel with Random Delay via Online Learning", *IEEE INFOCOM 2022 - IEEE Conference on Computer Communications*, 2022, pp. 1819-1827. (acceptance rate 19.9%)
15. X. Hou*, **H. Tang**, J. Wang and J. Song, "Information Directed Learning Algorithm for Minimizing Queue Length Regret," *2022 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB)*, 2022, pp. 1-5.

16. Y. Chen*, **H. Tang**, J. Wang and J. Song, "Adaptive Link Rate Selection for Throughput Maximization with Batched Thompson Sampling," *2022 IEEE International Conference on Communications Workshops (ICC Workshops)*, 2022, pp. 1-6.
17. **H. Tang**, X. Hou, J. Wang and J. Song, "Joint Link Rate Selection and Channel State Change Detection in Block-Fading Channels", *2021 IEEE Global Communications Conference (GLOBECOM)*, 2021, pp. 1-6.
18. C. Liu, **H. Tang**, T. Qin, J. Wang, Tie-Yan Liu, "On the Generative Utility of Cyclic Conditionals," *Advances in Neural Information Processing Systems* 34 (2021): 6155-6170.
19. C. Liu, X. Sun, J. Wang, **H. Tang**, T. Li, T. Qin, W. Chen, and T. Liu, "Learning Causal Semantic Representation for Out-of-Distribution Prediction", *Advances in Neural Information Processing Systems* 34 (2021): 6155-6170.
20. **H. Tang**, P. Ciblat, J. Wang, M. Wigger and R. Yates, "Cache Updating Strategy Minimizing the Age of Information with Time-Varying Files' Popularities.," *2020 IEEE Information Theory Workshop (ITW)*, 2021, pp. 1-5.
21. Y. Tan*, **H. Tang**, J. Wang and J. Song, "Early Drop: A Packet-Dropping Incentive Rate Control Mechanism to Keep Data Fresh under Heterogeneous QoS Requirements," *2021 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB)*, 2021, pp. 1-6.
22. **H. Tang**, P. Ciblat, J. Wang, M. Wigger and R. Yates, "Age of Information Aware Cache Updating with File- and Age-Dependent Update Durations," *2020 18th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOPT)*, Volos, Greece, 2020, pp. 1-6.
23. Y. Chen*, **H. Tang**, J. Wang, "Optimizing Age of Information in Multicast Unilateral Networks", *2020 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB)*, Virtual, 2020, pp. 1-4.
24. W. Zhan*, **H. Tang**, J. Wang, "Delay Optimal Cross-Layer Scheduling Over Markov Channels with Power Constraint", *2020 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB)*, Virtual, 2020, pp. 1-4.
25. Q. Zhang*, **H. Tang** and J. Wang, "Minimizing the Age of Synchronization in Power-Constrained Wireless Networks with Unreliable Time-Varying Channels," *IEEE INFOCOM 2020 - IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*, Toronto, ON, Canada, 2020, pp. 936-941.
26. **H. Tang**, J. Wang, L. Song and J. Song, "Scheduling to Minimize Age of Information in Multi-State Time-Varying Networks with Power Constraints," *2019 57th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, Monticello, IL, USA, 2019.
27. **H. Tang**, J. Wang, Z. Tang and J. Song, "Scheduling to Minimize Age of Synchronization in Wireless Broadcast Networks with Random Updates," *2019 IEEE International Symposium on Information Theory (ISIT)*, Paris, France, 2019, pp. 1027-1031.
28. **H. Tang**, J. Wang and Y. R. Zheng, "Covert communications with extremely low power under finite block length over slow fading," *IEEE INFOCOM 2018 - IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*, Honolulu, HI, 2018, pp. 657-661.
29. **H. Tang**, J. Wang and L. He, "Mutual information maximization for optimal spatial modulation MIMO system," *2017 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB)*, Cagliari, 2017, pp. 1-4.

Awards

APR. 2023 DAAD Postdoc-NeT-AI Fellowship
 OCT. 2022 EECS Rising Star, UT Austin

- APR. 2022 North American School of Information Theory Travel Grant
- APR. 2022 Zijing Scholar
- MAR. 2022 Infocom 2022 Student Grant
- JAN. 2022 Excellent Graduate of Beijing
- DEC. 2021 Women in Communications Engineering (WICE) Travel Grant for Globecom2021
- DEC. 2021 Microsoft Research Asia “Stars of Tomorrow” Excellent Intern
- APR. 2021 Tencent “Wizz Bird” Elite Research Student Program
- DEC. 2020 Stars of Haiying (awarded to PhD candidates in Haidian District, top 1 in each department)
- OCT. 2020 National Scholarship (top 2% in EE Department)
- OCT. 2020 Undergraduate Student Research Training First Prize (to my students Q. Zhang and W. Zhan)
- NOV. 2019 Best Paper Award, Department of Electronic Engineering PhD Forum, Tsinghua University
- SEP. 2019 First Class Scholarship for Comprehensive Excellence, Tsinghua University
- JUL. 2019 “Deng-Feng” Travel Award, Tsinghua University (for ISIT2019)
- APR. 2019 Stars of EE Department (Highest Honor for Graduate Student in EE Department for Research Excellence and Specialities), Tsinghua University
- 2014-2016 Zhou Huiqi Scholarship for overall excellence, Tsinghua University
- MAY. 2015 China Scholarship Council Excellent **Undergraduate** Fellowship
- Nov.** 2012 Silver Medal in 29th National Physics Olympics Contest(Ranking 61 out of 92000)

Invited Talk

Solving Inverse Problems with Pretrained Diffusion Models: A Policy Gradient Viewpoint

Seminar, Meta AI, Aug. 2023

Automated Networks Configurations for Time-Sensitive Applications

Seminar, Notre Dame University, Feb. 2023

Data Freshness Oriented Communication System Design: From Sampling to Scheduling

Seminar, Auburn University, Dec. 2022

Online Sampling for Data Freshness Optimization

EECS Rising Stars Workshop, UT Austin, Austin, Oct. 2022

Tsinghua University EE Department Graduate Forum/ Tsinghua-Berkeley Shenzhen Institute, May 2022

Graduation Day, Information Theory and Applications Workshop (ITA), UCSD, May 2022

Seminar, Institute of Network Science, Yale University, Jan 2022

Data Freshness oriented Scheduling in Time-Varying Networks

Young Researcher Forum, Sun Yat-Sen University, Dec. 2019

Seminar, School of Information Science, Shanghai University of Science and Technology, Oct. 2021

Teaching Experience

Communication Signal Processing

Spring 2021

Teaching Assistant, with Prof. Jintao Wang, at Tsinghua University

Communication Networks

Fall 2020

Guest Lecture on Information Freshness, with Prof. Jintao Wang, at Tsinghua University

Former Undergraduate Students working on Projects with me

Yuchao Chen: now PhD student@Tsinghua University (with Prof. Jintao Wang)

Chenghao Deng: now PhD student@the University of Maryland, College Park (with Prof. Furong Huang)

Wenhao Zhan: previously UGVR participant (with Prof. Ayfer Ozgur, 1/14 mainland China)
now PhD student@Princeton (with Prof. Yuxin Chen and Jason Lee)

Qining Zhang: now PhD student@University of Michigan (with Prof. Lei Ying)

Jinheng Zhang: ongoing

Yiqin Tan: now master student@IIIS, Tsinghua University (with Prof. Longbo Huang)

Xinyu Hou: now Research Engineer working in industry

Guozhi Chen: currently doing PhD

Academic Service**Reviewer**

IEEE Journal on Selected Areas in Information Theory

IEEE Transactions on Information Theory

IEEE/ACM Transactions on Networking

IEEE Journal on Selected Areas in Communications

IEEE/ACM Transactions on Mobile Computing

IEEE Transactions on Communications

IEEE Transactions on Wireless Communications

IEEE Communication Letters

IEEE Wireless Communication Letters

Journal Communication Networks

NeurIPS 2023 Workshop

IEEE International Conference on Computer Communications (Infocom) 2022, 2023

IEEE International Conference on Communications (ICC) 2022

IEEE Global Communications Conference (Globecom) 2021-2022

International Symposium on Information Theory (ISIT) 2020-2022

Information Theory Workshop 2022

Reference**Dr. Leandros Tassiulas**, Postdoctoral Research Advisor

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Dr. Jintao Wang, PhD Advisor

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Dr. Roy Yates

Distinguished Professor, Electrical & Computer Engineering, Rutgers University
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Dr. Michèle Wigger

Professor at Telecom Paris
michele.wigger@telecom-paris.fr

Dr. Yin Sun

Assistant Professor, Department of Electrical and Computer Engineering, Auburn University

November 29, 2023