

# Haoyue Tang

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

## Education

**Tsinghua University**, Beijing, China

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

B.S., Electrical Engineering, 2013-2017

## Employment

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

Postdoctoral Research Associate, 2022.01-

**Tencent Inc.**, Beijing, China

Research Intern, “Tencent Wizz Bird Elite Student Programme”, 2021.11-2022.01

Develop load balancing algorithm for database systems

**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)

Studied doubly robust contextual bandit algorithms in the presence of model mismatch

## Research Interest

I’ve been very excited about developing **learning and optimization** techniques to improve the connectivity and transmission robustness of networked system. The goal is to support emerging applications such as the virtual and augmented reality (VR/AR). The involved techniques include stochastic optimization, online learning, causal inference and non-parametric statistics.

## Awards

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)

## Publication<sup>1</sup>

### Citations

Total number of citations is 274, the most cited publication has 84 citations (source: Google Scholar on 12/05/2022)

### Preprints

1. **H. Tang**, Y. Sun, and L. Tassiulas, “Sampling of the Wiener Process for Remote Estimation over a Channel with Unknown Delay Statistics”, submitted, IEEE Transactions on Networking, <https://arxiv.org/abs/2207.08020>
2. J. Zhang, **H. Tang**, J. Wang, L. Tassiulas and S. Kompella, ”Minimizing Age of Information in a Non-Stationary Environment”, in preparation.

### Refereed Journal Articles

3. **H. Tang**, Y. Chen, J. Wang, P. Yang and L. Tassiulas, ”Age Optimal Sampling Under Unknown Delay Statistics”, IEEE Transactions on Information Theory, accepted, <https://ieeexplore.ieee.org/document/10004990>
4. 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.
5. **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.
6. **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.
7. **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.

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<sup>1</sup>(\* indicates students working on projects with me)

### Refereed Conference Articles

8. **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%)
9. **H. Tang**, Y. Chen, J. Wang, J. Sun and J. Song, "Sending Timely Status Updates through Channel with Random Delay via Online Learning", H. Tang, Y. Chen, J. Sun, J. Wang 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%)
10. 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.
11. 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.
12. **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.
13. 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.
14. 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.
15. **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.
16. 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.
17. **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.
18. 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.
19. 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.
20. 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.
21. **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.
22. **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.

23. **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.
24. **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.

## Invited Talk

### Automated Networks Configurations for Time-Sensitive Applications

Seminar, Southwest Jiaotong University, Dec. 2022

### 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/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  
IEEE International Conference on Computer Communications (Infocom) 2022  
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

John C. Malone Professor of Electrical Engineering & Computer Science, Yale University  
leandros.tassiulas@yale.edu

### **Dr. Jintao Wang**, PhD Advisor

Professor, Electrical Engineering, Tsinghua University  
wangjintao@tsinghua.edu.cn

### **Dr. Roy Yates**

Distinguished Professor, Electrical & Computer Engineering, Rutgers University  
ryates@rutgers.edu

### **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  
yinsun@auburn.edu

### **Dr. Zhi Sun**

Associate Professor, Electrical Engineering, Tsinghua University  
zhisun@tsinghua.edu.cn

January 11, 2023