

# Haiyun He

## Curriculum Vitae

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### Research Interests

Information theory (hypothesis testing, inference and estimation), statistical learning, machine learning, wireless communications

### Education

- 2018-2022 **National University of Singapore,**  
*Ph.D. in Electrical and Computer Engineering,*  
Thesis topic: “Fundamental Performance Limits of Statistical Problems: From Detection Theory to Semi-Supervised Learning”.  
Advisor: Prof. Vincent Y. F. Tan
- 2016-2017 **National University of Singapore,**  
*M.Sc. in Electrical Engineering,*  
Project topic: “Joint Altitude and Beamwidth Optimization for UAV-Enabled Wireless Communications”.  
Advisor: Prof. Rui Zhang
- 2012-2016 **Beihang University (BUAA/Beijing University of Aeronautics and Astronautics), Beijing, China,**  
*B.Eng. in Electrical and Information Engineering.*

### Professional Experience

- Jan 2023– **Postdoctoral Associate,** CORNELL UNIVERSITY, USA.  
Hosted by Prof. Ziv Goldfeld and Prof. Christina Lee Yu
- Jun 2022-Dec 2022 **Postdoctoral Fellow,** NATIONAL UNIVERSITY OF SINGAPORE, SINGAPORE.  
Hosted by Prof. Vincent Y. F. Tan
- Jan 2020-Apr 2020 **Visiting Student,** UNIVERSITY OF TORONTO, TORONTO, CANADA.  
Hosted by Prof. Ashish Khisti
- Feb 2018-Jul 2018 **Research Engineer,** NATIONAL UNIVERSITY OF SINGAPORE, SINGAPORE.  
Hosted by Prof. Vincent Y. F. Tan
- Feb 2016-Jun 2016 **CSC Exchange Undergraduate Student,** POLYTECHNIC UNIVERSITY OF TURIN, TURIN, ITALY.  
Department of Electronics and Telecommunications

### Publications

- Journal Papers
1. **Haiyun He**, Hanshu Yan and Vincent Y. F. Tan, “Information-Theoretic Characterization of the Generalization Error for Iterative Semi-Supervised Learning”, *Journal of Machine Learning Research*, Vol.23, No. 287, Pages 1–52, Aug. 2022 [[arXiv](#)].
  2. **Haiyun He**, Qiaosheng (Eric) Zhang and Vincent Y. F. Tan, “Optimal Change-Point Detection with Training Sequences in the Large and Moderate Deviations Regimes”, *IEEE Transactions on Information Theory*, Vol. 67, No. 10, Pages 6758–6784, Oct. 2021 [[arXiv](#)].
  3. **Haiyun He**, Lin Zhou and Vincent Y. F. Tan, “Distributed Detection with Empirically Observed Statistics”, *IEEE Transactions on Information Theory*, Vol. 66, Pages 4349–4367, July 2020 [[arXiv](#)].
  4. **Haiyun He**, Shuowen Zhang, Yong Zeng and Rui Zhang, “Joint Altitude and Beamwidth Optimization for UAV-Enabled Multiuser Communications”, *IEEE Communications Letters*, Vol. 22, No. 2, Pages 344–347, Feb. 2018 [[arXiv](#)].

- Conference Papers
1. **Haiyun He**, Gholamali Aminian, Yuheng Bu, Miguel Rodrigues, Vincent Y. F. Tan, "How Does Pseudo-Labeling Affect the Generalization Error of the Semi-Supervised Gibbs Algorithm?", Proc. of 26th International Conference on Artificial Intelligence and Statistics (AISTATS), Valencia, Spain, Apr 2023 (AR  $\approx$  29%)
  2. **Haiyun He**, Qiaosheng (Eric) Zhang and Vincent Y. F. Tan, "Optimal Resolution of Change-Point Detection with Empirically Observed Statistics and Erasures", ISITA 2020, Virtual Conference.
  3. **Haiyun He**, Lin Zhou, and Vincent Y. F. Tan, "Distributed Detection with Empirically Observed Statistics", ITW 2019, Visby, Gotland, Sweden.

## Teaching Experience

Instructor ○ AY 22/23 Cornell ORIE 4741/5741 Learning with Big Messy Data

Teaching Assistant

- AY 18/19 NUS EE4603 Biomedical Imaging Systems
- AY 19–22 NUS EE5139 Information Theory and its Applications
- AY 20/21 NUS CG2023 Signals and Systems
- AY 20/21 NUS EE5137 Stochastic Processes

## Honors and Awards

2021 EASIT 2021 Best Poster Award  
 2018 NUS Research Scholarship, 2018-2022  
 2016 Outstanding Graduate of Beihang University  
 2015 "Internet+" Innovation and Entrepreneurship Competition top 10 in Beijing, top 50 in China (*Project of Smart Band*)  
 2015 Honorable Mention of COMAP's Mathematical Contest in Modeling (MCM)  
 2013,2014 First-class Scholarship of Beihang University

## Presentations and Academic Activities

2022 EASIT 2022, Virtual Conference  
 Poster: "*Information-Theoretic Characterization of the Generalization Error for Iterative Semi-Supervised Learning*"

2021 BIID'9, Virtual Conference  
 Main program talk: "*Optimal Change-Point Detection with Training Sequences in the Large and Moderate Deviations Regimes*"

2021 EASIT 2021, Virtual Conference  
 Poster: "*Optimal Change-Point Detection with Training Sequences in the Large and Moderate Deviations Regimes*"

2021 CSCIT 2021, Virtual Conference

2020 ISITA 2020, Virtual Conference  
 Oral presentation: "Optimal Resolution of Change-Point Detection with Empirically Observed Statistics and Erasures"

2019 ITW 2019, Visby, Gotland, Sweden  
 Oral presentation: "Distributed Detection with Empirically Observed Statistics"

2019 CSCIT 2019, CUHK, Hong Kong, China  
 Poster: "Distributed Detection with Empirically Observed Statistics"

2018 ISIT 2018, Vail, Colorado, USA

2017 GlobeComm 2017, Singapore (Volunteer)

## Service

- Conference Reviewer
  - International Conference on Machine Learning (ICML) (2022, 2023)
  - International Symposium on Information Theory (ISIT) (2020, 2021, 2022, 2023)
  - China Communications, 2018
  - IEEE International Conference on Communications Workshops (ICC Workshops), 2018

- Journal Reviewer
  - IEEE Transactions on Information Theory
  - IEEE Communications Letters
  - IEEE Transactions on Signal Processing
  - IEEE Transactions on Signal and Information Processing over Networks
  - IEEE Internet of Things Journal
  - Neurocomputing

## Skills

- Programming Matlab, C/C++, Python
- Languages Chinese (Native), Cantonese (Native), English (Fluent), Japanese (Beginner)

## Interests

- Music, Movie, Swimming, Japanese