Hao He

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA — 2017 - present
Ph.D. student in Computer Science
M.S. in Computer Science — 2017 - Feb 2020
• Advisor: Prof. Dina Katabi GPA: 5.0/5.0

Peking University, China — 2013 - 2017
B.S. in Computer Science
• Major GPA: 3.93/4.00 (rank 1st)

EXPERIENCE

Research Assistant, MIT — Sep 2017 to Present
Advisor: Prof. Dina Katabi

Health-care Solutions with Wireless Sensing and Machine Learning

• The first model to predict oxygenation from breathing signals. Enable the WiFi-based remote sensing of blood oxygen level.
• Propose a new concept of *continousuly indexed domain adaptation*. The method brings significant improvement for health care applications like sleep stage classification.
• Propose the first convolutional neural network for WiFi-based fall detection.
• Propose the first WiFi-based respiration monitoring system that can recover the breathing signals of multiple individuals even when they are separated by zero distance.

Deep Learning for System Design

• Propose the first graph neural network that optimizes high-frequency (THz) circuits.

Research Intern, Microsoft Research — Sep 2016 to Aug 2017
Mentor: David Wipf

Neural Sparse Bayesian Learning Algorithm

• Propose a novel RNN that solves hard sparse matrix inverse problem with a theory of translating the Sparse Bayesian Learning algorithm to recurrent neural network cell.

Mentor: Stephen Lin

White Box Photo Post-Processing Framework

• Propose the first reinforcement learning augmented GANs framework for photo retouching under arbitary resolutions.

PUBLICATIONS **Google Scholar Profile**

NEW MANUSCRIPTS

Learning Blood Oxygen from Respiration Signals
Hao He*, Yingcong Chen*, Yuan Yuan*, Dina Katabi. *in Submission.*

Information-Preserving Contrastive Learning for Self-Supervised Representations
Tianhong Li*, Lijie Fan, Yuan Yuan, **Hao He**, Dina Katabi. *in Submission.*

CONFERENCE PAPERS

Continuously Indexed Domain Adaptation.
Hao Wang*, **Hao He***, Dina Katabi
International Conference on Machine Learning (ICML), 2020

Learning Compositional Koopman Operators for Model-Based Control
Yunzhu Li*, **Hao He***, Jiajun Wu, Dina Katabi, Antonio Torralba
International Conference on Learning Representations (ICLR), 2020

Circuit-GNN: Graph Neural Networks for Distributed Circuit Design
Hao He*, Guo Zhang*, Dina Katabi
International Conference on Machine Learning (ICML), 2019

ProbGAN: Towards Probabilistic GAN with Theoretical Guarantees
Hao He, Hao Wang, Guang-He Lee, Yonglong Tian
International Conference on Learning Representations (ICLR), 2019

Hierarchical Bidirectional Inference Networks for Health Profiling
Hao Wang, Chengzhi Mao, **Hao He**, Dina Katabi, Tommi jaakkola
The Thirty-Third AAAI Conference on Artificial Intelligence (AAAI), 2019

RF-Based Fall Monitoring Using Convolutional Neural Networks
Hao He*, Yonglong Tian*, Guang-he Lee*, Dina Katabi, Chen-yu Hsu
ACM International Joint Conference on Pervasive and Ubiquitous Computing, 2018

Extracting Multi-Person Respiration from Entangled RF Signals
Shichao Yue, **Hao He**, Dina Katabi
ACM International Joint Conference on Pervasive and Ubiquitous Computing, 2018

Exposure: A White-Box Photo Post-Processing Framework
Yuanming Hu, **Hao He**, Chenxi Xu, Baoyuan Wang, Stephen Lin
ACM Transactions on Graphics (TOG), 2018

From Bayesian Sparsity to Gated Recurrent Nets
Hao He, Bo Xin, Satoshi Ikehata, David Wipf
Conference on Neural Information Processing Systems (NeurIPS), 2017 *(Oral)*

WORKSHOP PAPERS

Learning Caching Policies with Subsampling
Haonan Wang, **Hao He**, Mohammad Alizadeh, Hongzi Mao
Machine Learning for Systems Workshop, NeurIPS, 2019

Towards Safe Online Reinforcement Learning in Computer Systems
Hongzi Mao, Malte Schwarzkopf, **Hao He**, Mohammad Alizadeh
Machine Learning for Systems Workshop, NeurIPS, 2019

SERVICES

Program Committee for AAAI, UAI	2021
Reviewer for ICLR, CVPR, ICML	2021
Program Committee for AAAI, IJCAI, UAI	2020
Reviewer for ICML, NeurIPS	2020
Program Committee for UAI, GraphReason@ICML, GraphLearning@NeurIPS	2019
Reviewer for ICML, NeurIPS	2019
Program Committee for TFADG@ICML	2018

COURSES

System: Computer Network (6.892) (A+)
AI: Algorithm for Inference (6.438) (A), Information and Inference (6.437) (A), Fundamentals of Probability(6.436) (A), Bayesian Modelling and Inference (6.882) (A), Non-Asymptotic Statistics (9.521) (PE)
Theory: Learning-Augmented Algorithms (6.890) (A), An Algorithmist's Toolkit (18.408) (A+)

AWARDS

- National Scholarship for Excellent Academic Performance, China (highest, twice)
- Arawana Scholarship for Excellent Academic Performance, Peking University
- ACM-ICPC 2015 Asia Regional Shenyang Site, Gold Medal
- ACM-ICPC 2014 Asia Regional Anshan Site, Gold Medal