

RESEARCH INTERESTS

Reinforcement Learning, Online Learning & Multi-Armed Bandits, Statistical Machine Learning, Tensor Learning

EDUCATIONS

Ph.D. in Statistics Sep. 2014 - Dec. 2019

Department of Statistics, Purdue University

Thesis Advisor: Dr. Guang Cheng

B.S. in Statistics Sep. 2010 - Aug. 2014

School of Mathematics, Nankai University

Thesis Advisor: Dr. Changliang Zou

PROFESSIONAL EXPERIENCES

▲ Deepmind, London, UK Nov. 2020 - Present

Research Scientist

▲ Department of Electrical Engineering, Princeton University, NJ Dec. 2019 - Nov. 2020

Postdoctoral Researcher

Mentor(s): Dr. Mengdi Wang

▲ Deepmind, London, UK May 2019 - Sep. 2019

Research Intern

Mentor(s): Dr. Tor Lattimore, Dr. Csaba Szepesvári

▲ Adobe Research, San Jose, CA May 2018 - Aug. 2018

Research Intern

Mentor(s): Dr. Zheng Wen

VISITING EXPERIENCES

▲ Simons Institute, Berkeley, CA Aug. 2020 - Dec. 2020

Visiting Postdoc [[Profile](#)]

Theory of Reinforcement Learning Program

▲ School of Mathematics, Institute for Advanced Study, NJ Jan. 2020 - Apr. 2020

Visiting Postdoc

Special Year on Optimization, Statistics, and Theoretical Machine Learning

JOURNAL PUBLICATIONS

▲ Sparse Tensor Additive Regression

Botao Hao, Boxiang Wang, Pengyuan Wang, Emma Jingfei Zhang, Jian Yang, Will Wei Sun

Journal of Machine Learning Research (2021). [[ArXiv](#)]

▲ Sparse and Low-rank Tensor Estimation via Cubic Sketchings

Botao Hao, Anru Zhang, and Guang Cheng

IEEE Transactions on Information Theory (2020). [[ArXiv](#)]

▲ Nonparametric Bayesian Aggregation for Massive Data

Zuofeng Shang, **Botao Hao**, and Guang Cheng

Journal of Machine Learning Research (2019). [[ArXiv](#)]

▲ Simultaneous Clustering and Estimation of Heterogeneous Graphical Models

Botao Hao, Will Wei Sun, Yufeng Liu, and Guang Cheng
Journal of Machine Learning Research (2018). [[ArXiv](#)]

CONFERENCE PUBLICATIONS

- ▲ **Bootstrapping Statistical Inference for Off-Policy Evaluation**
Botao Hao, Xiang Ji, Yaqi Duan, Hao Lu, Csaba Szepesvári, Mengdi Wang
ICML 2021. [[ArXiv](#)]
- ▲ **Sparse Feature Selection Makes Batch Reinforcement Learning More Sample Efficient**
Botao Hao, Yaqi Duan, Tor Lattimore, Csaba Szepesvári, Mengdi Wang
ICML 2021. [[ArXiv](#)]
- ▲ **Online Sparse Reinforcement Learning**
Botao Hao, Tor Lattimore, Csaba Szepesvári, Mengdi Wang
AISTATS 2021. [[ArXiv](#)]
- ▲ **Adaptive Approximate Policy Iteration**
Botao Hao, Nevena Lazic, Yasin Abbasi-Yadkori, Pooria Joulani, Csaba Szepesvári
AISTATS 2021. [[ArXiv](#)]
- ▲ **High-Dimensional Sparse Linear Bandits**
Botao Hao, Tor Lattimore, Mengdi Wang
NeurIPS 2020. [[ArXiv](#)]
- ▲ **Adaptive Exploration in Linear Contextual Bandit**
Botao Hao, Tor Lattimore, and Csaba Szepesvári
AISTATS 2020. [[ArXiv](#)]
- ▲ **Sparse and Low-rank Tensor Estimation via Cubic Sketchings**
Botao Hao, Anru Zhang, and Guang Cheng
AISTATS 2020. [[Link](#)]
- ▲ **Bootstrapped Upper Confidence Bound**
Botao Hao, Yasin Abbasi-Yadkori, Zheng Wen, and Guang Cheng
NeurIPS 2019. [[ArXiv](#)]

BOOK CHAPTERS

- ▲ **Tensors in Modern Statistical Learning** in Handbook of Computational Statistics and Data Science
Will Wei Sun, **Botao Hao**, Lexin Li
Submitted. [[Preprint](#)]

PREPRINTS

- ▲ **Optimization Issues in KL-Constrained Approximate Policy Iteration**
Nevena Lazic, **Botao Hao**, Yasin Abbasi-Yadkori, Dale Schuurmans, Csaba Szepesvári
Submitted. [[ArXiv](#)]
- ▲ **Interacting Contour Stochastic Gradient Langevin Dynamics**
Wei Deng, Siqi Liang, **Botao Hao**, Guang Lin, Faming Liang
Submitted.
- ▲ **Low-rank Tensor Bandits**
Botao Hao, Jie Zhou, Zheng Wen, Will Wei Sun
Submitted. [[ArXiv](#)]
- ▲ **Residual Bootstrap Exploration for Bandit Algorithms**
Chi-Hua Wang*, Yang Yu*, **Botao Hao**, Guang Cheng
Submitted. [[ArXiv](#)]

HONORS AND AWARDS

- ▲ Bilsland Dissertation Fellowship 2019-2020
Nominated and selected by members of the graduate faculty to support outstanding Ph.D. candidates in the final year of doctoral degree completion across the whole university.
- ▲ NeurIPS 2019 Travel Award

INVITED TALKS

- ▲ Deepmind for Google, Mountain View, CA Jan. 2020
- ▲ Institute of Statistics, Nankai University, Tianjin Dec. 2018
- ▲ International Conference on Data Science, Shanghai Dec. 2017
- ▲ The 25th ICSA Applied Statistics Symposium, Chicago Jun. 2017
- ▲ Conference on Statistical Learning and Data Science, Chapel Hill, NC Jun. 2016

TEACHING EXPERIENCES

- ▲ Lab Instructor, STAT 301: Elementary Statistical Methods, Spring 2015, Summer 2015, Fall 2015
- ▲ Lab Instructor, STAT 113: Statistics and Society, Summer 2017
- ▲ Grader, STAT 519: Introduction to Probability Theory, Fall 2014, Spring 2015, Fall 2016, Fall 2017
- ▲ Grader, STAT 516: Basic Probability and Applications, Fall 2015

SERVICES

- ▲ Session chair for Machine Learning/Intelligence Cluster at 2020 INFORMS annual meeting
- ▲ Co-chair of Ubicomp 2019 Workshop on [Continual and Multimodal Learning for Internet of Things](#), London, UK
- ▲ Reviewers for Journals:
 - Annals of Statistics
 - Journal of the American Statistical Association
 - Journal of Machine Learning Research
 - Journal of Multivariate Analysis
 - Computational Statistics and Data Analysis
 - The IEEE Control Systems Letters
 - Statistica Sinica
 - Biostatistics
 - IEEE Journal on Selected Areas in Information Theory
 - Transactions on Pattern Analysis and Machine Intelligence
- ▲ Reviewers for Conferences: AAAI 2021, ICLR 2021, NeurIPS 2019-2021, AISTATS 2020-2021, ICML 2020-2021, UAI 2020-2021