BOJIAN HOU

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EDUCATION

Nanjing University (NJU) **Ph.D.**
Department of Computer Science and Technology *Sep.2014-Jun.2020*
Supervisor: Prof. Zhi-Hua Zhou

Nanjing University (NJU) **Bachelor of Science**
Department of Computer Science and Technology *Sep.2010-Jun.2014*

WORK EXPERIENCE

University of Pennsylvania *Jan.2022-Present* **Postdoctoral Researcher**

Cornell University *May.2021-Jan.2022* **Postdoctoral Associate**

4th Paradigm Co. *Aug.2020-Apr.2021* **Research Scientist**

RESEARCH INTEREST

I have broad interests in **machine learning** and **data mining**, and their potential applications to biomedical data.

During my doctoral studies, I developed a novel learning scenario known as feature evolvable learning, where data features would evolve in an open and dynamic environment. The goal was to keep optimal online learning performance in dynamic feature space. I also studied semi-supervised learning and interpretability problems, such as storage-fit learning with unlabeled data and learning the interpretable structure from RNNs, respectively.

At my postdoctoral position, I mainly built natural language processing models to do medical literature mining, conducted multimodal survival analysis for medical images and clinical data, and investigated the potential issues of the interpretability methodologies for medical data.

In summary, my research interests include:

- **Natural Language Processing**: using pre-trained models to understand natural language.
- **Interpretability**: studying the interpretability of black-box machine learning models.
- **Feature Evolvable Learning**: studying learning scenarios where data features evolve.
- **Multimodal Learning**: learning models by combining diverse data with different modalities.
- **Semi-Supervised Learning**: learning models from both labeled and unlabeled data.
- **Online Learning**: learning models from a continuous stream of data.
- **Deep Learning**: leveraging deep neural networks to handle complex spatial and temporal data.

PUBLICATIONS

Conference

1. **Bo-Jian Hou**, Lijun Zhang, and Zhi-Hua Zhou. *Learning with Feature Evolvable Streams.* **In: Advances in Neural Information Processing Systems 30 (NIPS'17), Long Beach, CA**, 2017, 30: 1417-1427. (Ranked #2 in Artificial Intelligence by Google Scholar)

2. **Bo-Jian Hou**, Yu-Hu Yan, Peng Zhao and Zhi-Hua Zhou. *Storage Fit Learning with Feature Evolvable Streams*. **In: Proceedings of the AAAI Conference on Artificial Intelligence (AAAI'21), Virtual Conference**, 2021, 35(9), 7729-7736. (Ranked #4 in Artificial Intelligence by Google Scholar)

3. **Bo-Jian Hou**, Lijun Zhang, and Zhi-Hua Zhou. *Storage Fit Learning with Unlabeled Data*. **In: Proceedings of the 26th International Joint Conference on Artificial Intelligence (IJCAI'17), Melbourne, Australia**, 2017, 1844-1850. (Ranked #9 in Artificial Intelligence by Google Scholar)

4. Yi He, Jiaxian Dong, **Bo-Jian Hou**, Yu Wang, and Fei Wang. *Online Learning in Variable Feature Spaces with Mixed Data*. **In: Proceedings of the 21st IEEE International Conference on Data Mining (ICDM'21), Auckland, New Zealand**, 2021, 181-190. (Ranked #6 in Data Mining & Analysis by Google Scholar)

5. Heng Lian, John S. Atwood, **Bo-Jian Hou**, Jian Wu, Yi He. *Online Deep Learning from Doubly-Streaming Data*. **In: Proceedings of the 30th ACM International Conference on Multimedia (ACMMM'22), Lisbon, Portugal**, 2022, in press. (Ranked #4 in Multimedia by Google Scholar)

6. **Bo-Jian Hou** and Yuan Jiang. *Learning Interpretability from RNN with Feature Evolving*. **In: CCF Conference on Artificial Intelligence (CCFAI'19), Xuzhou, China, 2019**. (Recipient of the CCFAI Outstanding Student Paper Award)

Journal

6. **Bo-Jian Hou**, Lijun Zhang, and Zhi-Hua Zhou. *Prediction with Unpredictable Feature Evolution*. **IEEE Transactions on Neural Networks and Learning Systems (TNNLS)**, 2021, in press. (Impact factor: 14.255, Ranked #7 in Artificial Intelligence by Google Scholar)

7. **Bo-Jian Hou** and Zhi-Hua Zhou. *Learning with Interpretable Structure from Gated RNN*. **IEEE Transactions on Neural Networks and Learning Systems (TNNLS)**, 2020, 31(7): 2267-2279. (Impact factor: 14.255, Ranked #7 in Artificial Intelligence by Google Scholar)

8. **Bo-Jian Hou**, Lijun Zhang, Zhi-Hua Zhou. *Learning with Feature Evolvable Streams*. **IEEE Transactions on Knowledge and Data Engineering (TKDE)**, 2019, 33(6): 2602-2615. (Impact factor: 9.235, Ranked #2 in Data Mining & Analysis by Google Scholar)

9. Jie Ren, **Bojian Hou**, and Yuan Jiang. *Deep Forest for Multiple Instance Learning*. **Journal of Computer Research and Development**, 2019, 56(8): 1670-1676. (Impact factor: 1.043)

10. Mingquan Lin, **Bojian Hou**, Lei Liu, Mae Gordon, Michael Kass, Fei Wang, Sarah H. Van Tassel, Yifan Peng. *Automated diagnosing primary open-angle glaucoma from fundus image by simulating human's grading with deep learning*. **Scientific Reports**, 2022, in press. (Impact factor: 4.379)

Manuscript

11. **Bojian Hou**, Hao Zhang, Gur Ladizhinsky, Ali Kayyal, Stephen Yang, Volodymyr Kuleshov, Fei Wang and Qian Yang. *Clinical Evidence Engine: Proof-of-Concept For a Clinical-Domain-Agnostic Decision Support Infrastructure*. **arXiv preprint** arXiv:2111.00621, 2021

12. Jing-Xiao Liao, **Bo-Jian Hou**, Hang-Cheng Dong, Hao Zhang, Jianwei Ma, Jinwei Sun, Shiping Zhang, Feng-Lei Fan. *Heterogeneous Autoencoder Empowered by Quadratic Neurons*. **arXiv preprint** arXiv:2204.01707, 2022

13. Dayang Wang, Feng-Lei Fan, **Bo-Jian Hou**, Hao Zhang, Rongjie Lai, Hengyong Yu, Fei Wang. *Manifoldron: Direct Space Partition via Manifold Discovery*. **arXiv preprint** arXiv:2201.05279, 2022

14. Zhen Zhou, Hongming Li, Chau B. Tran, Rongyao Hu, Guray Erus, Elizabeth Mamourian, Ahmed Abdulkadir, Junhao Wen, Ilya Nasrallah, Dhivya Srinivasan, **Bojian Hou**, Nick R. Bryan, David A. Wolk, Lori Beason-Held, Susan M. Resnick, Haochang Shou, Christos Davatzikos, Yong Fan and the ISTAGING Consortium. *Cross-Scale Functional Connectivity Patterns of The Aging Brain Learned From The Multi-Cohort Istaging Stduy.* Submitted to **IEEE International Symposium on Biomedical Imaging (ISBI'23)**, 2023

15. **Bojian Hou**, Hongming Li, Zhicheng Jiao, Zhen Zhou, Hao Zhang, Yong Fan. *Deep Clustering Survival Machines with Interpretable Expert Distributions.* Submitted to **IEEE International Symposium on Biomedical Imaging (ISBI'23)**, 2023

16. Mingquan Lin, Yuyun Xiao, **Bojian Hou**, Tingyi Wanyan, Mohit Manoj Sharma, Zhangyang Wang, Fei Wang, Sarah Van Tassel, Yifan Peng. *Evaluate Underdiagnosis and Overdiagnosis Bias of Deep Learning Model on Primary Open-Angle Glaucoma Diagnosis in Under-Served Populations.* Submitted to **AMIA 2023 Informatics Summit**, 2023

AWARDS & HONORS

Excellent Doctoral Dissertation Award of Jiangsu Province 2021

Excellent Doctoral Dissertation Award of Nanjing University 2021

JSAI Excellent Doctoral Dissertation Award 2020

CS Excellent Doctoral Dissertation Award of Nanjing University 2020

Outstanding Graduate Student Award of Nanjing University 2020

CCFAI Outstanding Student Paper Award. 2019

The Program A for Outstanding PhD Candidate of Nanjing University 2019

National Scholarship for Ph.D. 2017

NeurIPS Volunteer Award 2017

IJCAI Travel Award 2017

Outstanding Undergraduate Student Award of Nanjing University 2014

National Endeavor Scholarship 2012

PROFESSIONAL ACTIVITIES

Program Committee (PC) Member or Reviewer of Conferences

· PC Member of NeurIPS'22 (The 36th Annual Conference on Neural Information Processing Systems)
· PC Member of ICML'22 (The 39th International Conference of Machine Learning)
· PC Member of NeurIPS'21 (The 35th Annual Conference on Neural Information Processing Systems)
· SPC Member of IJCAI'21 (The 30th International Joint Conference on Artificial Intelligence)
· PC Member of ICML'21 (The 38th International Conference of Machine Learning)
· PC Member of AAAI'21 (The 35th AAAI Conference on Artificial Intelligence) (**I was selected as one of the top 25% PC members at this conference.**)
· Reviewer of KDD'20 (The 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining)
· PC Member of NeurIPS'20 (The 34th Annual Conference on Neural Information Processing Systems)
· PC Member of AISTATS'20 (The 23rd International Conference on Artificial Intelligence and Statistics)
· PC Member of ICLR'20 (The 8th International Conference on Learning Representations)
· PC Member of AAAI'20 (The 34th AAAI Conference on Artificial Intelligence)
· PC Member of DFM'19 (The 1st ICDM Workshop on Dynamic Feature Mining)

· Reviewer of PRICAI'19 (The 16th Pacific Rim International Conference on Artificial Intelligence)
· PC Member of CCML'19 (The 17th China Conference on Machine Learning)
· PC Member of NeurIPS'19 (The 33rd Annual Conference on Neural Information Processing Systems)
· PC Member of ICML'19 (The 36th International Conference of Machine Learning)
· PC Member of AISTATS'19 (The 22nd International Conference on Artificial Intelligence and Statistics)
· PC Member of ICLR'19 (The 7th International Conference on Learning Representations)
· PC Member of AAAI'19 (The 33rd AAAI Conference on Artificial Intelligence)
· PC Member of NeurIPS'18 (The 32nd Annual Conference on Neural Information Processing Systems)

Reviewer of Journals

· Reviewer of TPAMI (IEEE Transactions on Pattern Analysis and Machine Intelligence)
· Reviewer of TNNLS (IEEE Transactions on Neural Networks and Learning Systems)
· Reviewer of TII (IEEE Transactions on Industrial Informatics)
· Reviewer of Nature Methods
· Reviewer of Machine Learning
· Reviewer of TKDD (ACM Transactions on Knowledge Discovery from Data)
· Reviewer of Scientific Reports.
· Reviewer of KIS (Knowledge and Information Systems)
· Reviewer of FCS (Frontiers of Computer Science)

Other Services

· Web Chair of MLA'16 (The 14th Chinese Workshop on Machine Learning and Applications)
· Web Chair of MLA'15 (The 13rd Chinese Workshop on Machine Learning and Applications)
· Web Chair of LAMDA Group from Sept. 2014 to Sept. 2017 (Including updating each page of LAMDA website, maintaining mail server, maintaining course FTP etc.)

TEACHING ASSISTANTS

Computational Thinking (for undergraduate students). Fall, 2016

Introduction to Java (for undergraduate students). Fall, 2014

TECHNICAL STRENGTHS

Programming:	Python, Java, C/C++, MATLAB, Bash, LaTex, HTML, CSS
Machine Learning Platforms:	PyTorch, Tensorflow, Keras, Pandas, Scikit-Learn, SciPy
Other Tools:	Word, Powerpoint, Excel, Origin, Mendeley

LEADERSHIP

2014 Class Representative of Department of Computer Science and Technology at Nanjing University Sep. 2010 - Jun. 2014

President of Graduate English Club of Nanjing University Sep. 2014 - Jun. 2016