Shen-Huan LYU | Ph.D.

College of Computer and Information, Hohai University
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Education

2017 - 2022: **Nanjing University (NJU)**

Ph.D. in Computer Science

Department of Computer Science & Technology

Supervisor: Prof. Zhi-Hua Zhou

2013 - 2017: **University of Science and Technology of China (USTC)**

B.Sc. in Statistics

Department of Statistics

Research Interests

My current research interests mainly include Machine Learning and Data Mining. More specifically, I am interested in the following topics:

- Ensemble Learning

- Learning Theory and Optimization

Publications

*: Equal Contribution

Conference Papers

[NeurIPS 2019]: **Shen-Huan Lyu**, Liang Yang, and Zhi-Hua Zhou. A Refined Margin Distribution Analysis for Forest Representation Learning. In: **Advances in Neural Information Processing Systems 32 (NeurIPS'19)**, pp. 5531-5541, Vancouver, CA, 2019. **(CCF-A)**

[ICDM 2021]: Yi-He Chen*, **Shen-Huan Lyu***, and Yuan Jiang. Improving Deep Forest by Exploiting High-order Interactions. In: **Proceedings of the 21th IEEE International Conference on Data Mining (ICDM'21)**, pp. 1030-1035, Auckland, NZ, 2021. **(CCF-B)**

[NeurIPS 2022]: **Shen-Huan Lyu**, Yi-Xiao He, and Zhi-Hua Zhou. Depth is More Powerful than Width in Deep Forest. In: **Advances in Neural Information Processing Systems 35 (NeurIPS'22)**, pp. 29719-29732, New Orleans, US, 2022. **(CCF-A, Oral)**

[AISTATS 2023]: Qin-Cheng Zheng, **Shen-Huan Lyu**, Shao-Qun Zhang, Yuan Jiang, and Zhi-Hua Zhou. GridCART: A CART with Convergence Guarantee. In: **Proceedings of the 22nd International Conference on Artificial Intelligence and Statistics (AISTATS'22)**, pages to appear, Valencia, ES, 2023. **(CCF-C)**

Journal Papers

[NN 2022]: **Shen-Huan Lyu**, Lu Wang, and Zhi-Hua Zhou. Improving Generalization of Neural Networks by Leveraging Margin Distribution. **Neural Networks**, 151:48-60, 2022. **(CCF-B)**

[CJE 2022]: **Shen-Huan Lyu**, Yi-He Chen, and Zhi-Hua Zhou. A Region-based Analysis for Feature Concatenation in Deep Forests. **Chinese Journal of Electronics**, 31(6):1072-1080, 2022. **(CCF-A in Chinese)**

[JOS 2024]: **Shen-Huan Lyu**, Yi-He Chen, and Zhi-Hua Zhou. Interaction Representations Based Deep Forest Method in Multi-Label Learning. **Journal of Software**, 2024. **(CCF-A in Chinese)**

[TKDD 2024]: Yi-Xiao He, **Shen-Huan Lyu**, and Yuan Jiang. Interpreting Deep Forest through Feature Contribution and MDI Feature Importance. **ACM Transactions on Knowledge Discovery from Data**, 2024.

(CCF-B)

Preprints

[Draft]: Yi-Xiao He, Dan-Xuan Liu, **Shen-Huan Lyu**, Chao Qian, and Zhi-Hua Zhou. Multi-Class Imbalance Problem: A Multi-Objective Solution. **Information Sciences**, under review. **(CCF-B)**

[Draft]: **Shen-Huan Lyu**, Yi-Xiao He, Baoliu Ye. BODTs: Boosting Oblique Decision Trees via Feature Concatenation Mechanism. **IJCAI'24**, under review. **(CCF-A)**

Academic Service

Program Committee Member of Conferences:

- ICML: 2021 - 2024
- NeurIPS: 2020 - 2024
- AAAI: 2019, 2022, 2023
- IJCAI: 2020 - 2024
- ICLR: 2021, 2023
- AISTATS: 2019, 2022

Reviewer of Journal:

- Artificial Intelligence (AIJ)
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- ACM Transactions on Knowledge Discovery from Data (TKDD)
- Machine Learning (MLJ)

Honors and Awards

[1]: Excellent Doctoral Dissertation of Jiangsu Artificial Intelligence Society (Ranked 1/3), Nanjing, 2023.

[2]: Artificial Intelligence Scholarship in Nanjing University, Nanjing, 2019.

[3]: Presidential Special Scholarship for first-year Ph.D. Student in Nanjing University, Nanjing, 2017.

[4]: The Second Class Academic Scholarship in Nanjing University, Nanjing, 2020.

[5]: The University Silver Prize Scholarship for Excellent Student in University of Science and Technology of China, Hefei, 2014-2016.

Teaching Assistant

[1]: C++ Programming. (With Prof. Hao Hu; For Undergraduate Students, Spring, 2019)

[2]: LAMDA Machine Learning Summer Seminar. (For New Students in LAMDA, Summer, 2018)

[3]: Introduction to Machine Learning. (With Prof. Zhi-Hua Zhou; For Undergraduate Students, Spring, 2018)

[4]: LAMDA-1 Theory Seminar. (Topics: Forest Theory, Neural Network Theory, Generalization Theory, and Diversity; For Students in LAMDA-1, Spring, 2022)