Yu-Jie Zhang

The University of Tokyo

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EDUCATION

The University of Tokyo, Japan
Ph.D. candidate, Complexity Science and Engineering

October 2021 - Present
Supervisor: Prof. Masashi Sugiyama

Nanjing University, China
M.Sc., Computer Science and Technology

June 16, 2021
Supervisor: Prof. Zhi-Hua Zhou

Tongji University, China
B.Sc., Electronic Science and Technology

July 01, 2018
GPA: 4.91/5.00, ranking 1/32

RESEARCH EXPERIENCE

I am generally interested in exploring the theoretical foundations of machine learning and developing methods with robust theoretical guarantees. Currently, I am focused on developing provably adaptive and reliable methods for non-stationary and open-world environments. My research topics include *online learning*, *bandit algorithms*, *reinforcement learning*, and *learning with imperfect data*.

- **Online Learning in Non-stationary Environments:** We develop online learning methods that adapt promptly to non-stationary environment with *dynamic regret guarantees*.

- **Sequential Decision Making with Non-Linear Rewards:** We study contextual bandits with *non-linear feedback functions* and their applications to reinforcement learning theory.

- **Learning with Imperfect data:** We develop reliable methods to learn with weak supervision and handle unknown classes in the test stage with *excess risk guarantees*.

PUBLICATIONS

Preprints

[1] Long-Fei Li, **Yu-Jie Zhang**, Peng Zhao, and Zhi-Hua Zhou. Provably Efficient Reinforcement Learning with Multinomial Logit Function Approximation.

Conference Publications

[2] Yu-Yang Qian, Peng Zhao, **Yu-Jie Zhang**, Masashi Sugiyama, Zhi-Hua Zhou. Efficient Non-stationary Online Learning by Wavelets with Applications to Online Distribution Shift Adaptation. In: Proceedings of the 41st International Conference on Machine Learning (**ICML**), 2024.

[3] Wei Wang, Takashi Ishida, **Yu-Jie Zhang**, Gang Niu, and Masashi Sugiyama. Learning with Complementary Labels Revisited: A Consistent Approach via Negative-Unlabeled Learning. In: Proceedings of the 41st International Conference on Machine Learning (**ICML**), 2024.

[4] **Yu-Jie Zhang** and Masashi Sugiyama. Online (Multinomial) Logistic Bandit: Improved Regret and Constant Computation Cost. In Advances in Neural Information Processing Systems 36 (**NeurIPS**), 2023. [**Spotlight**]

[5] **Yu-Jie Zhang**, Zhen-Yu Zhang, Peng Zhao, and Masashi Sugiyama. Adapting to Continuous Covariate Shift via Online Density Ratio Estimation. In Advances in Neural Information Processing Systems 36 (**NeurIPS**), 2023.

[6] Xin-Qiang Cai, **Yu-Jie Zhang**, Chao-Kai Chiang and Masashi Sugiyama. Imitation Learning from Vague Feedback. In Advances in Neural Information Processing Systems 36 (**NeurIPS**), 2023.

[7] Yong Bai*, **Yu-Jie Zhang***, Peng Zhao, Masashi Sugiyama, and Zhi-Hua Zhou. Adapting to Online Label Shift with Provable Guarantees. In Advances in Neural Information Processing Systems 35 (**NeurIPS**), 2022. (* equal contribution)

[8] Zhen-Yu Zhang, Yu-Yang Qian, **Yu-Jie Zhang**, Yuan Jiang, Zhi-Hua Zhou. Adaptive Learning for Weakly Labeled Streams. In Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD**), 2022.

[9] **Yu-Jie Zhang**, Yu-Hu Yan, Peng Zhao and Zhi-Hua Zhou. Towards Enabling Learnware to Handle Unseen Jobs. In Proceedings of the 35th AAAI Conference on Artificial Intelligence (**AAAI**), 2021.

[10] Peng Zhao, **Yu-Jie Zhang** and Zhi-Hua Zhou. Exploratory Machine Learning with Unknown Unknowns. In Proceedings of the 35th AAAI Conference on Artificial Intelligence (**AAAI**), 2021.

[11] **Yu-Jie Zhang**, Peng Zhao, Lanjihong Ma and Zhi-Hua Zhou. An Unbiased Risk Estimator for Learning with Augmented Classes. In Advances in Neural Information Processing Systems 33 (**NeurIPS**), 2020.

[12] Peng Zhao, **Yu-Jie Zhang**, Lijun Zhang and Zhi-Hua Zhou. Dynamic Regret of Convex and Smooth Functions. In Advances in Neural Information Processing Systems 33 (**NeurIPS**), 2020.

[13] **Yu-Jie Zhang**, Peng Zhao, and Zhi-Hua Zhou. A Simple Online Algorithm for Competing with Dynamic Comparators. In Proceedings of the 36th Conference on Uncertainty in Artificial Intelligence (**UAI**), 2020.

Journal Publications

[14] Sijia Chen, **Yu-Jie Zhang**, Wei-Wei Tu, Peng Zhao, and Lijun Zhang. Optimistic Online Mirror Descent for Bridging Stochastic and Adversarial Online Convex Optimization. Journal of Machine Learning Research (**JMLR**), to appear, 2024.

[15] Peng Zhao, **Yu-Jie Zhang**, Lijun Zhang, and Zhi-Hua Zhou. Adaptivity and Non-stationarity: Problem-dependent Dynamic Regret for Online Convex Optimization. Journal of Machine Learning Research (**JMLR**), 25(98):1−52, 2024.

[16] Peng Zhao, Jia-Wei Shan, **Yu-Jie Zhang** and Zhi-Hua Zhou. Exploratory Machine Learning with Unknown Unknowns. Artificial Intelligence (**AIJ**), 327:104059, 2024.

AWARDS & HONORS

- Top Reviewer for NeurIPS, 2023
- Top Reviewer for UAI, 2023
- Top Reviewer for NeurIPS, 2022
- The University of Tokyo Fellowship, Tokyo, 2021
- Outstanding Master Dissertation Award by Jiangsu Computer Society, Nanjing, 2021
- Excellent Graduate of Nanjing University, Nanjing, 2021
- National Graduate Scholarship for Master Student, MOE of PRC, 2020

ACADEMIC SERVICE

- **Reviewer for Conference**: NeurIPS (2021-2024), ICML (2022-2024), ICLR (2022-2024), AISTATS (2021-2024), UAI (2022-2024), AAAI (2021, 2024), IJCAI (2020-2023), ECAI (2020).

- **Reviewer for Journal**: Journal of Machine Learning Research (JMLR), IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Frontiers of Computer Science.