YANG LI（郦洋）

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中文简介

上海交通大学人工智能学院一年级博士生，研究方向为机器学习求解离散优化以及生成式模型，主要成果包括：

- 把 consistency model （or diffusion model）类似的思想引入到经典预测场景，提出新的监督（标签）学习范式，把网络学习的映射关系从 x 预测 y 变成从 x + y_t 预测 y，说明 label 作为部分信息引入模型输入也能帮助模型学习，希望开辟 ML 中如何利用标签的新思路，在 LLM SFT、visual segmentation、complex graph problems 上验证效果。
- 关于生成式智能决策, 提出了领先的学习优化求解框架及求解器 T2T 和 Fast T2T，首次提出基于扩散模型的训练到测试两阶段求解框架，同时提出优化场景下适配的一致性模型，在智能最优化决策的机器学习方法中取得大幅提升，其核心理念被 Nvidia 北美研究团队用于网表优化应用中。
- 关于优化问题数据生成, 针对基础优化问题如 SAT 问题和 MILP 问题为缓解工业场景数据瓶颈提出基于图模型的数据生成算法，首次生成计算复杂度近似的优化问题数据。算法被集成到华为天筹 OptVerse AI 求解器中，求解器成果在 Hans Mittelmann 国际权威数学优化求解器榜单中排名第一，并在 2023 年世界人工智能大会上获得最高奖 SAIL 奖。
- 智能决策机器学习框架的研究线设计机器学习求解路径规划问题、更广泛优化问题的框架，对领域技术总结归纳和策略重组，为领域发展提供工具包和指导方向。探索预测、决策联合过程中预测决策一体化方法的框架，重新思考不同场景下预测决策一体化技术的应用。在传统启发式算法中引入在线学习决策自动化调整算法，独立编码开发了 Kissat-Adaptive-Restart 求解器并在华为海思的 EDA 业务场景中取得了显著成果，平均性能提升约 18%，最大提升达 97%。
- 为生成模型如对抗生成网络等引入一个新的优化维度，即隐变量优化，显著提升生成模型表现，同时从采样角度提出算法解决生成多样性问题，成果获评 NeurIPS22 Spotlight Paper。

一作/共同一作发表相关论文 10 篇，包含 CCF/CAAI A 类顶级会议论文 8 篇，共发表 A 类论文 15 篇，包括 NeurIPS、ICML、ICLR 等，曾获 NeurIPS 和 ICML 的 Spotlight 论文（前 5% 和 3.5%）。参与机器学习求解离散优化资源库开源项目、华为重要技术开源等工作，开源社区获超两千星。本科、研究生学业前 1-2%，获研究生国家奖学金（系 1%）、本科生国家奖学金（全国 0.2%）、上海市优秀毕业生(系 5%)、华为奖学金（系 3%）、鹰角奖学金 (系 3%)、上海交大一等优秀奖学金（系 1%）等荣誉。

EDUCATION

Shanghai Jiao Tong University (SJTU), Shanghai, China — Mar. 2025 – Present

Doctor (Upgraded from Master's Program), School of Artificial Intelligence
Major: Computer Science and Technology, Supervisor: Weinan E and Junchi Yan

Shanghai Jiao Tong University (SJTU), Shanghai, China — Sep. 2022 – Mar. 2025

Master, School of Computer Science, Supervisor: Junchi Yan

- GPA: 3.83/4.0. Rank Reference: 3 out of 211 achieving the Graduate National Scholarship
- Courses: 90.0% at A level

Shanghai Jiao Tong University (SJTU), Shanghai, China — Sep. 2018 – Jul. 2022

Bachelor, School of Computer Science

- GPA: 91.03/100 (or 3.93/4.3), Rank: 3/129
- Foundation Courses: 73.33% above A, 40.00% above A+
- Subject Courses: 80% above A, 50.00% above A+

PUBLICATIONS

First-authored (in Chronological Order):

1. **Generative Modeling Reinvents Supervised Learning: Label Repurposing by Predictive Consistency Learning**

Yang Li, Jiale Ma, Yebin Yang, Qitian Wu, Hongyuan Zha, Junchi Yan
Forty-Second International Conference on Machine Learning ICML 2025

2. **Unify ML4TSP: Drawing Methodological Principles for TSP and Beyond from Streamlined Design Space of Learning and Search**
Yang Li, Jiale Ma, Wenzheng Pan, Runzhong Wang, Haoyu Geng, Nianzu Yang, Junchi Yan
International Conference on Learning Representations, ICLR 2025
3. **Fast T2T: Optimization Consistency Speeds Up Diffusion-Based Training-to-Testing Solving for Combinatorial Optimization**
Yang Li, Jinpei Guo, Runzhong Wang, Hongyuan Zha, Junchi Yan
Advances in Neural Information Processing Systems, NeurIPS 2024
4. **MixSATGEN: Learning Graph Mixing for SAT Instance Generation**
Xinyan Chen*, Yang Li*, Runzhong Wang, Junchi Yan (*: equal contribution)
International Conference on Learning Representations, ICLR 2024
5. **T2T: From Distribution Learning in Training to Gradient Search in Testing for Combinatorial Optimization**
Yang Li, Jinpei Guo, Runzhong Wang, Junchi Yan
Advances in Neural Information Processing Systems, NeurIPS 2023
6. **HardSATGEN: Understanding the Difficulty of Hard SAT Formula Generation and A Strong Structure-Hardness-Aware Baseline**
Yang Li, Xinyan Chen, Wenxuan Guo, Xijun Li, Wanqian Luo, Junhua Huang, Hui-Ling Zhen, Mingxuan Yuan, Junchi Yan
SIGKDD Conference on Knowledge Discovery and Data Mining, KDD 2023
7. **IID-GAN: an IID Sampling Perspective for Regularizing Mode Collapse**
Yang Li*, Liangliang Shi*, Junchi Yan (*: equal contribution)
International Joint Conference on Artificial Intelligence, IJCAI 2023
8. **Improving Generative Adversarial Networks via Adversarial Learning in Latent Space**
Yang Li, Yichuan Mo, Liangliang Shi, Junchi Yan
Advances in Neural Information Processing Systems, NeurIPS 2022 (Spotlight Top 5%)
9. **Kissat_Adaptive_Restart, Kissat_Cfexp: Adaptive Restart Policy and Variable Scoring Improvement**
Yang Li, Yuqi Jia, Wanqian Luo, Hui-Ling Zhen, Xijun Li, Mingxuan Yuan, Junchi Yan
Proceedings of SAT Competition 2022
10. **The SAT Encoding for Graph Isomorphism**
Yang Li, Yuqi Jia, Wanqian Luo, Hui-Ling Zhen, Xijun Li, Mingxuan Yuan, Junchi Yan
Proceedings of SAT Competition 2022

Other (in Chronological Order):

1. **COExpander: Adaptive Solution Expansion for Combinatorial Optimization**
Jiale Ma, Wenzheng Pan, Yang Li, Junchi Yan
Forty-Second International Conference on Machine Learning ICML 2025
2. **UniCO: On Unified Combinatorial Optimization via Problem Reduction to Matrix-Encoded General TSP**
Hao Xiong, Wenzheng Pan, Jiale Ma, Wentao Zhao, Yang Li, Junchi Yan
International Conference on Learning Representations, ICLR 2025
3. **Learning Plaintext-Ciphertext Cryptographic Problems via ANF-based SAT Instance Representation**
Xinhao Zheng, Yang Li, Cunxin Fan, Huaijin Wu, Xinhao Song, Junchi Yan
Advances in Neural Information Processing Systems, NeurIPS 2024
4. **There is No Silver Bullet: Benchmarking Methods in Predictive Combinatorial Optimization**
Haoyu Geng, Han Ruan, Runzhong Wang, Yang Li, Yang Wang, Lei Chen, Junchi Yan
Advances in Neural Information Processing Systems, NeurIPS 2024
5. **正线性约束组合优化问题的非自回归学习求解 | Learning to Solve Combinatorial Optimization under Positive Linear Constraints via Non-Autoregressive Neural Networks**
汪润中, 郦洋, 严骏驰, 杨小康 | Runzhong Wang, Yang Li, Junchi Yan, Xiaokang Yang
中国科学：信息科学 | SCIENTIA SINICA Informationis 2024.
6. **ACM-MILP: Adaptive Constraint Modification via Grouping and Selection for Hardness-Preserving**

MILP Instance Generation
Ziao Guo, Yang Li, Chang Liu, Wenli Ouyang, Junchi Yan
International Conference on Machine Learning, ICML 2024 (Spotlight Top 3.5%)

7. **Molecule Generation for Drug Design: a Graph Learning Perspective**
Nianzu Yang, Huaijin Wu, Kaipeng Zeng, Yang Li, Junchi Yan
Fundamental Research, 2024
8. **Machine Learning Insides OptVerse AI Solver: Design Principles and Applications**
Xijun Li, Fangzhou Zhu, Hui-Ling Zhen, Weilin Luo, Meng Lu, Yimin Huang, Zhenan Fan, Zirui Zhou, Yufei Kuang, Zhihai Wang, Zijie Geng, Yang Li, Haoyang Liu, Zhiwu An, Muming Yang, Jianshu Li, Jie Wang, Junchi Yan, Defeng Sun, Tao Zhong, Yong Zhang, Jia Zeng, Mingxuan Yuan, Jianye Hao, Jun Yao, Kun Mao
arXiv preprint, 2024
9. **The Policy-gradient Placement and Generative Routing Neural Networks for Chip Design**
Ruoyu Cheng, Xianglong Lyu, Yang Li, Junjie Ye, Jianye Hao, Junchi Yan
Advances in Neural Information Processing Systems, NeurIPS 2022

Experience

ReThinkLab, Shanghai Jiao Tong University, Shanghai, China — Jul. 2021 – Present

Researcher Supervisor: Prof. Junchi Yan, Prof. Weinan E

See Publications for research outputs.

- Undergraduate researcher and master researcher, having published **5 first-authored papers** in top-tier ML conferences to date.
- My research interests lie in **machine learning for combinatorial optimization and generative models.**
- We maintain a list of resources that utilize machine learning technologies to solve combinatorial optimization problems in **awesome-ml4co** (`https://github.com/Thinklab-SJTU/awesome-ml4co`). The repository covers the learning-based efforts for 34 different combinatorial optimization problems and includes over 300 papers in the ML4CO community. The repository has gained over 1,000 stars on GitHub.

Learning Optimization Solver Project, with **Huawei Noah′ s Ark Lab** — Apr. 2022 – Feb. 2023

Researcher Leader/Mentor: Xijun Li and Prof. Junchi Yan

Main objects lie in the developing superior SAT solvers and exploring insightful ideas regarding the SAT problem, ultimately making valuable contributions to both the research community and practical applications.

- The **SAT solver Kissat_Adaptive_Restart** that I was personally responsible for achieved 12th place in Anniversary Track and 26th place in Main Track worldwide.
- The solving strategy is **integrated into Huawei's practical applications**, with an average performance gain of around 18% and a maximum performance improvement of 97%.
- My first-authored paper on SAT instance generation "HardSATGEN: Understanding the Difficulty of Hard SAT Formula Generation and A Strong Structure-Hardness-Aware Baseline" was accepted in **KDD 2023**.
- The data-level contribution is integrated into **HUAWEI CLOUD's OptVerse AI Solver**. OptVerse AI Solver solves problems with hundreds of millions of variables, at 100x computing speed thanks to distributed parallel acceleration. OptVerse AI Solver ranked first on the Hans Mittelmann Benchmark for Simplex LP solvers and won the most prestigious award at the World Artificial Intelligence Conference 2023: SAIL (Super AI Leader) Award.

Honors and Awards

NeurIPS 2024 Top Reviewer	2024
National Scholarship (top 0.2% in the nation)	2019
Graduate National Scholarship (top 1% in the CS department)	2023
Outstanding Graduate of Shanghai (top 3%)	2022
Huawei Fellowship (top 3%)	2020
HyperGryph Fellowship (top 3%)	2021
1st-Class Academic Excellence Scholarship (top 1%)	2019
Merit Student of Shanghai Jiao Tong University	2019, 2020
1st-Class Academic Scholarship for Graduate Students	2022

Special Prize for Social Practice of SJTU	2020
First Prize for Social Practice of SJTU	2019
Advanced Individuals in Social Practice of SJTU	2020

MISCELLANEOUS

- Academic Service: I serve as the reviewer for top-tier ML conferences, e.g. NeurIPS, ICML, ICLR, and journals, e.g. TPAMI.
- Blog: https://yangco-le.github.io/
- GitHub: https://github.com/yangco-le
- Languages: English - Experienced, Mandarin - Native speaker