

# RUNZHONG WANG

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## INTEREST

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Machine Learning, Graph Learning and related Optimization Problems. I am also interested in tackling real-world problems with social impact via my technical expertise.

## EDUCATION

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**Shanghai Jiao Tong University University** *Sept 2019-Jun 2023 (expected)*  
PhD student, Computer Science and Engineering  
Advisors: Prof. Xiaokang Yang and Prof. Junchi Yan

**Shanghai Jiao Tong University University** *Sept 2015-Jun 2019*  
Bachelor of Engineering, Information Engineering

## PUBLICATION

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- Runzhong Wang**, Junchi Yan and Xiaokang Yang. “Neural Graph Matching Network: Learning Lawler’s Quadratic Assignment Problem with Extension to Hypergraph and Multiple-graph Matching.” *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2022.
- Runzhong Wang**, Zhigang Hua, Gan Liu, Jiayi Zhang, Junchi Yan, Feng Qi, Shuang Yang, Jun Zhou, Xiaokang Yang. “A Bi-Level Framework for Learning to Solve Combinatorial Optimization on Graphs.” *Neural Information Processing Systems (NeurIPS)*, 2021.
- Runzhong Wang**, Tianqi Zhang, Tianshu Yu, Junchi Yan and Xiaokang Yang. “Combinatorial Learning of Graph Edit Distance via Dynamic Embedding.” *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
- Runzhong Wang**, Junchi Yan and Xiaokang Yang. “Graduated Assignment for Joint Multi-Graph Matching and Clustering with Application to Unsupervised Graph Matching Network Learning.” *Neural Information Processing Systems (NeurIPS)*, 2020.
- Runzhong Wang**, Junchi Yan and Xiaokang Yang. “Combinatorial Learning of Robust Deep Graph Matching: an Embedding based Approach.” *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 2020.
- Runzhong Wang**, Junchi Yan and Xiaokang Yang. “Learning Combinatorial Embedding Networks for Deep Graph Matching.” *International Conference on Computer Vision (ICCV Oral)*, 2019.
- Runzhong Wang\***, Hao-shu Fang\*, Jianhua Sun\*, Minghao Gou, Yong-Lu Li, Cewu Lu. “InstaBoost: Boosting Instance Segmentation via Probability Map Guided Copy-Pasting.” *International Conference on Computer Vision (ICCV)*, 2019.
- Chang Liu, Chenfei Lou, **Runzhong Wang**, Alan Yuhan Xi, Li Shen, Junchi Yan. “Deep Neural Network Fusion via Graph Matching with Applications to Model Ensemble and Federated Learning.” *International Conference on Machine Learning (ICML)*, 2022.
- Qibing Ren, Qingquan Bao, **Runzhong Wang**, Junchi Yan. “Appearance and structure aware robust deep visual graph matching: Attack, defense and beyond.” *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022.

10. Tianshu Yu, **Runzhong Wang**, Junchi Yan and Baoxin Li. “Deep Latent Graph Matching.” *International Conference on Machine Learning (ICML)*, 2021.
11. Tianshu Yu, **Runzhong Wang**, Junchi Yan and Baoxin Li. “Learning Deep Graph Matching with Channel-Independent Embedding and Hungarian Attention.” *International Conference on Learning and Representations (ICLR)*, 2020.
12. “Relaxed Combinatorial Optimization Networks with Self-Supervision: Theoretical and Empirical Notes on the Cardinality-Constrained Case.” With Li Shen, Yiting Chen, Xiaokang Yang, Junchi Yan, and Dacheng Tao. *Under review of International Conference on Learning and Representations (ICLR)*, 2023.
13. “Deep Learning of Partial Graph Matching.” With Ziao Guo, Shaofei Jiang, Xiaokang Yang, and Junchi Yan. *Under review of Computer Vision and Pattern Recognition (CVPR)*, 2023.

\* equal contribution

## OPEN-SOURCE PROJECTS

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- awesome-ml4co** <https://github.com/Thinklab-SJTU/awesome-ml4co> **803 stars**  
 An up-to-date collection of awesome machine learning for combinatorial optimization papers.
- ThinkMatch** <https://github.com/Thinklab-SJTU/ThinkMatch> **670 stars**  
 The most comprehensive deep graph matching library and the de-facto standard research protocol.
- pygmtools** <https://github.com/Thinklab-SJTU/pygmtools> **155 stars**  
 An easy-to-use library for two graph matching, multi-graph matching and neural graph matching.
- PPO-BiHyb** <https://github.com/Thinklab-SJTU/PPO-BiHyb> **66 stars**  
 A general bi-level framework for learning to solve combinatorial optimization on graphs.
- InstaBoost** <https://github.com/GothicAi/Instaboost> **392 stars**  
 A data-augmentation protocol that works with parallel dataloaders for instance segmentation tasks.

## INDUSTRIAL EXPERIENCE

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**Ant Group (Hangzhou, remotely with Sunnyvale, CA)** Jan 2021 - May 2021  
*Research Intern* *Mentor: Zhigang Hua, Jun Zhou*

- I was responsible for developing a general framework for learning to solve combinatorial optimization problems on graphs, and our proposed method outperforms both learning-free heuristics and learning-based baselines. A research paper was published at NeurIPS 2021.

**JD Explore Academy (Beijing)** May 2021 - Sept 2021  
*Research Intern* *Mentor: Li Shen, Dacheng Tao*

- I was responsible for developing a cardinality constrained neural network with theoretical characterization of its constraint-violation and we explored its application in pure combinatorial optimization and joint prediction and optimization. A research paper was submitted to ICLR 2023.

**MYbank (Shanghai)** Oct 2022 - Jan 2023 (Planned)  
*Algorithm Engineer Intern* *Mentor: Bing Han*

- I was responsible for developing machine learning-aided combinatorial optimization methods for smart marketing and portfolio management. Preliminary experiment shows that optimization-based marketing strategy improves CVR by 5%, and the annual return of portfolios is improved by 20%.

## TEACHING

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**Teaching Assistant:** Deep Learning and Its Applications. Lecturer: Prof. Junchi Yan and Prof. Wei Shen. Fall 2021/Fall 2022. AI 3607, Shanghai Jiao Tong University.

**Teaching Assistant:** Deep Learning and Its Applications. Lecturer: Prof. Junchi Yan. Fall 2021. MS 326, Shanghai Jiao Tong University.

## STUDENTS

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I help my advisers and work closely with the following students at Shanghai Jiao Tong University:

**Liu Chang** (PhD Student), first-authored ICML 2022, in submission to ICLR 2023.

**Haoyu Geng** (PhD Student), preparing for SIGCOMM 2023.

**Han Lu** (PhD Student), in submission to ICLR 2023.

**Qibing Ren** (MS Student), first-authored CVPR 2022. Next: PhD at SJTU.

**Tianqi Zhang** (MS Student), co-authored CVPR 2021. Next: Bytedance (TikTok China).

**Jiayi Zhang** (MS Student), co-authored NeurIPS 2021.

**Yang Li** (MS Student), in submission to ICLR 2023.

**Zhijie Chen** (MS Student), work in progress. Next: PhD at UIUC.

**Chenfei Lou** (Undergraduate), co-authored ICML 2022. Next: MS at CMU.

**Qingquan Bao** (Undergraduate), co-authored CVPR 2022. Next: Research Assistant at MIT.

**Zenan Li** (Undergraduate), in submission to ICLR 2023. Sensetime Fellowship. Next: PhD at PKU.

**Ziao Guo** (Undergraduate), in submission to CVPR 2023. Next: PhD at SJTU.

**Shaofei Jiang** (Undergraduate), in submission to CVPR 2023. Next: PhD at SJTU.

**Jinpei Guo** (Undergraduate), in submission to CVPR 2023.

## AWARDS

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- National Scholarship, 2022
- CCF-CV Outstanding Young Researcher Award, 2021 (3 winners in China)
- Computer Science Fellowship at Shanghai Jiao Tong University, 2021 (3 winners at SJTU)
- Nomination Award of the MSRA Fellowship, 2021 (17 nominations in Asia)
- Best poster award at International Conference on Data Science 2019 (1 winner)
- Jiachi Yang Scholarship at Shanghai Jiao Tong University, 2020
- Wen-Tsun Wu Honorary Scholarship at Shanghai Jiao Tong University, 2019-2023
- Xu Zhang Scholarship at Shanghai Jiao Tong University, 2019-2023
- Outstanding Reviewer of ICML 2022

## ACADEMIC SERVICE

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- I serve as the reviewer for conferences (NeurIPS 2020/2021/2022, ICML 2022, ICLR 2022/2023, CVPR 2020/2021/2022/2023, ICCV 2021, ECCV 2022, AAAI 2021/2022, CIKM 2019, MM 2021/2022) and journals (IJCV, TPAMI, PR, TMM, TCSVT).
- I serve as the student president of Wen-Tsun Wu Honorary Doctoral Class at Shanghai Jiao Tong University since 2019.