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Wenjie Wu

Education

Shanghai, China **Shanghai Jiao Tong University** **Sep. 2022 – Present**

- M.E. in Control Science and Engineering. GPA: 3.86 / 4.00. Rank: 3 / 53. Advisor: Junchi Yan.

Shanghai, China **Shanghai Jiao Tong University** **Sep. 2018 – Jun. 2022**

- B.E. in Automation (Direction of Artificial Intelligence) with honor, June 2022. Minor: Computer Science. In-major GPA: 3.90 / 4.30. Rank: 1 / 115.

Internship

Algorithm Engineer, Intern **ByteDance** **Jun. 2024 – Oct. 2024**

- Different vendors provide paid push notification services to the Douyin app. In order to increase Douyin's DAU, A/B testing is conducted for different combinations of vendors and paid features. Samples are collected to train a push notification uplift model, and based on the prediction results, the optimal push strategy is determined to achieve a significant 0.179% increase for Honor LT.
- In the past, the number of coarse ranking inputs was too few to fully demonstrate its capabilities. Now, the number of coarse ranking items has been increased from 1k to 2k, resulting in significant LT improvement on both the main Douyin app and the Lite version. Subsequent attempts to add features, increase model complexity, and modify the sample flow did not lead to significant LT improvements. Through interpretative experiments, it was discovered that the bottleneck lies in the recall stage, and improvements in recall are needed to open up more space for refinement of coarse ranking.

Algorithm Engineer, Intern **Shanghai AI Laboratory** **Mar. 2024 – Jun. 2024**

- Multimodal large models perform poorly in extraction and understanding tasks of multi-page scientific documents. A scientific document understanding benchmark, DocGenome, is proposed, which includes 500K articles, 7 major tasks, and existing multimodal large models as baselines to help improve the understanding capabilities of multimodal models.
- Multimodal large models have shortcomings in understanding geometry and mathematical logic. A geometric multimodal large model and a unified geometric pretraining framework are proposed. Pretraining and fine-tuning are conducted on the collected geometric corpus and datasets, achieving results that surpass existing multimodal large models.

Software Engineer, Intern **XYZ Robotics** **Nov. 2021 – Feb. 2022**

- The current real-world packing scenarios require algorithms with low time complexity. By conducting complexity and time analysis of existing algorithms, a two-dimensional prefix sum algorithm is proposed to optimize the summation computation in the height map update process, achieving polynomial-level acceleration for the algorithm.
- To test the effectiveness of reinforcement learning algorithms in real-world packing scenarios, more than ten existing reinforcement learning-based packing algorithms were reviewed and tested on industrial datasets, resulting in a 5% improvement in space utilization.

Algorithm Engineer, Intern **Hikvision** **Jul. 2021 – Aug. 2021**

- The OCR text extraction results from newspaper scans contain recognition errors. By using text correction models Soft-Masked BERT and MacBERT, the sentence-level correction accuracy on the newspaper OCR dataset reached 81.5% and 72.4%, respectively, a 3% improvement compared to the results reported in the paper.

Publications

[1] **W. Wu**, Y. Wang, G. Yan, et al., "On Reducing the Execution Latency of Superconducting Quantum Processors via Quantum Job Scheduling", *ICCAD*, 2024

[2] **W. Wu**, G. Yan, X. Lu, et al., "QuantumDARTS: differentiable quantum architecture search for variational quantum algorithms", *ICML*, 2023.

[3] X. Lu, K. Pan, G. Yan, J. Shan, **W. Wu** and J. Yan, "QAS-bench: rethinking quantum architecture search and a benchmark", *ICML*, 2023.

[4] G. Yan, **W. Wu**, et al. "Quantum Circuit Synthesis and Compilation Optimization: Overview and Prospects." *In submission*, 2024.

[5] R. Xia, …, **W. Wu**, et al., "DocGenome: An Open Large-scale Scientific Document Benchmark for Training and Testing Multi-modal Large Language Models", *In submission*, 2024

[6] **W. Wu**, C. Fan, J. Huang, Z. Liu and J. Yan, "Machine Learning for the Multi-Dimensional Bin Packing Problem: Literature Review and Empirical Evaluation", *Arxiv*, 2023.

[7] **W. Wu** and J. Yan, "Research on Dynamic Bin Packing Problem and Design of Intelligent Algorithm", *Bachelor Thesis*, 2022.

Research Experience

Quantum Architecture Search **ReThinkLab, SJTU** **Sep. 2023 – May. 2024**

- Public quantum cloud resources are in short supply. To improve the utilization of quantum resources, a noise-aware quantum job scheduling method was proposed and experimentally validated on a quantum cloud platform. This successfully reduced the turnaround time to 1/10 of the baseline. The first-author paper was published at ICCAD 2024.

Quantum Job Scheduling **ReThinkLab, SJTU** **Oct. 2022 – Feb. 2023**

- In the quantum circuit search scenario, the Gumbel-Softmax technique was used to automatically search for the target quantum circuits, making the entire framework end-to-end differentiable. This significantly improved training efficiency and accuracy in ground state energy prediction and image classification tasks. The first-author paper was published at ICML 2023.

Undergraduate Internship **MARS Lab, Tsinghua University** **Apr. 2021 – Jul. 2021**

- Mentor: Hang Zhao.
- Applied knowledge distillation techniques to object detection.

Undergraduate Internship **SJTU** **Jul. 2020 – Mar. 2021**

- Mentor: Bingbing Ni.
- Diagnosed and segmented adrenal anomalies from CT scans with 3D deep learning.

Awards

2023	Grand Prize in Quantum Computing Track of ”Challenge Cup” National Contest (Top 5).
2023	First Prize in CCF ”Sinan Cup” Quantum Computing Contest.
2023 – 2024	National Scholarship for Graduate Students (Top 1%).
2022 – 2023	National Scholarship for Graduate Students (Top 1%).
2020 – 2021	National Scholarship for Undergraduate Students (Top 1%).
2020	Honorable Mention in Interdisciplinary Contest In Modeling (ICM).

Skills

- **Programming Languages:** Python, C/C++, Matlab, etc.
- **Deep Learning:** PyTorch, Gym, Numpy, etc.
- **Languages:** TOEFL: 105 (Jul. 2020), CET6: 631, CET4: 620.
- **Miscs:** Football.

Academic Services

- Reviewers in NeurIPS 2023, ICLR 2024.