Cong Zhang

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Education

Nanyang Technological University (NTU) — Singapore
Ph.D. in Computer Science; CGPA: 4.00/4.50. — *Aug 2018 – Present*

Imperial College London (ICL) — London, UK
Master of Science with Merit in Computer Science. — *Otc 2015 – Nov 2016*

University of Liverpool (UoL) — Liverpool, UK
Bachelor of Science with Honours in Mathematics; First Class Honours. — *Sep 2011 – July 2015*

Xi'an Jiaotong-Liverpool University (XJTLU) — Suzhou, China
Bachelor of Science with Honours in Applied Mathematics; First Class Honours. — *Sep 2011 – July 2015*

Research Interests

My research mainly lies in the intersection of Artificial Intelligence and Operations Research. I am particularly interested in leveraging Deep Learning and Reinforcement Learning to solve challenging combinatorial optimization problems in various application domains, such as job-shop scheduling and vehicle routing. I am a Ph.D. student from the school of computer science and engineering (SCSE) NTU supervised by Assoc Prof. Zhang Jie, Dr. Tan Puay Siew, and Dr. Xu Chi.

Honors and Awards

Singapore International Graduate Award (SINGA). 2018-2022, Singapore

- SINGA is an award offered to international students with excellent academic undergraduate and/or master's results, and strong interest in doing research leading to a doctorate (PhD) in Science and Engineering at a Singapore University by the Singapore Government. I was honored to receive this distinguished full-time scholarship in 2018.

XJTLU Excellent Undergraduate Award. 2013-2015, UoL

- For the period of study at the University of Liverpool, I received an XJTLU award which provided a 20% reduction to the tuition fees for excellent undergraduate students in both the 2013/14 and 2014/15 academic years.

XJTLU The Second Class Entry Scholarship. 2011, XJTLU

- I was awarded a Second Class Entry Scholarship, which contributed one-time RMB 30,000 towards my tuition fees.

HWG702 University Teaching for Teaching Assistant. 2019, NTU

- I successfully completed all eight modules of the HWG702 University Teaching for Teaching Assistants Programme and attained a 'recommended to teach' grade.

Research Experience

Research Assistant, SIMTech A*STAR | Advisors: Dr. Tan Puay Siew & Dr. Xu Chi *2019 – present*
I participated in the "RIE 2020 Advanced Manufacturing and Engineering (AME) IAF-PP, Cyber-Physical Production System (CPPS) - Towards Contextual and Intelligent Response" project where I jointly proposed a genetic algorithm-based approach to solve the scheduling problem in the semiconductor manufacturing system, which is submitted to Expert Systems with Applications.

Research Assistant, The Hong Kong Polytechnic University | Advisor: Dr.Chung Fu Lai *Nov 2017 – Jun 2018*

Skills

Programming Languages: Python, C/C++, Java, HTML, CSS
Frameworks & Tools: Pytorch, Pytorch-Geometric (PyG), Docker, GitHub, LaTeX
Soft Skill: English Writing and Presentation Skills

Teaching Experiences

CS2002 Object Oriented Design and Programming - Labs *Aug 2022*
Course advisor: Prof. Zhang Jie

Publication and Preprint

(∗ means equal contribution.)

[1] Chupeng Su, **Cong Zhang**, Dan Xia, Baoan Han, Chuang Wang, Gang Chen, and Longhan Xie. Evolution strategy-based optimized graph reinforcement learning for solving dynamic job shop scheduling problem. In *International Journal of Production Research*, 2022. (`IJPR-2022`, Under review)

[2] Xianli Zhang, **Cong Zhang**, Yanchao Wang, and Jie Zhang. A batching integrated genetic algorithm for complex job shop scheduling problem. In *Expert Systems with Applications*, 2022. (`ESWA-2022`, Under review)

[3] **Cong Zhang**∗, Yaoxin Wu∗, Yining Ma∗, Wen Song, Le Zhang, Zhiguang Cao, and Jie Zhang. A review on learning for optimization in manufacturing. In *IET Collaborative Intelligent Manufacturing*, 2022. (`CIM-2022`, Invited Paper, Major revision)

[4] **Cong Zhang**, Wen Song, Zhiguang Cao, Jie Zhang, Puay Siew Tan, and Xu Chi. Learning topological representations with bidirectional graph attention network for solving job shop scheduling problem. In *IEEE Transactions on Neural Networks and Learning Systems*, 2022. (`TNNLS-2022`, Pending submission)

[5] Wenhui Huang, **Cong Zhang**, Jingda Wu, Xiangkun He, Jie Zhang, and Chen Lv. Sampling efficient deep reinforcement learning through preference-guided stochastic exploration. In *IEEE Transactions on Neural Networks and Learning Systems*, 2022. (`TNNLS-2022`, Under review)

[6] **Cong Zhang**, Wen Song, Zhiguang Cao, Jie Zhang, Puay Siew Tan, and Xu Chi. Learning to search for job shop scheduling via deep reinforcement learning. In *Thirty-Seventh AAAI Conference on Artificial Intelligence*, 2023. (`AAAI-2023`: NeurIPS-2022 fast track, Under review)

[7] Jing Sun, Shuo Chen, **Cong Zhang**, and Jie Zhang. Opponent modeling with purely local information. In *Thirty-Seventh AAAI Conference on Artificial Intelligence*, 2023. (`AAAI-2023`, Under review)

[8] Rongkai Zhang∗, **Cong Zhang**∗, Zhiguang Cao, Wen Song, Puay Siew Tan, Jie Zhang, Wen Bihan, and Justin Dauwels. Learning to solve multiple-tsp with time window and rejections via deep reinforcement learning. In *IEEE Transactions on Intelligent Transportation Systems*, 2022. (`TITS-2022`)

[9] **Cong Zhang**∗, Wen Song∗, Zhiguang Cao, Jie Zhang, Puay Siew Tan, and Xu Chi. Learning to dispatch for job shop scheduling via deep reinforcement learning. In *Advances in Neural Information Processing Systems*, volume 33, pages 1621–1632. Curran Associates, Inc., 2020. (`NeurIPS-2020`)