Quantum Computing Research

Recently, I became interested in solving combinatorial optimization problems with hybrid classical-quantum and quantum-inspired algorithms. Here are the pubs in Quantum Computing and pictures of my group at SMU.

Monit Sharma and Hoong Chuin Lau. A Comparative Study of Quantum Optimization Techniques for Solving Combinatorial Optimization Benchmark Problems. https://arxiv.org/abs/2503.12121

Monit Sharma and Hoong Chuin Lau. Quantum Monte Carlo methods for Newsvendor problem with Multiple Unreliable Suppliers. http://arxiv.org/abs/2409.07183

Ningyi Xie, Xinwei Lee, Dongsheng Cai, Yoshiyuki Saito, Nobuyoshi Asai and Hoong Chuin Lau. A Feasibility-Preserved Quantum Approximate Solver for the Capacitated Vehicle Routing Problem. *Quantum Information Processing*, Issue 8/2024. Presented in *27th International Conf. on Quantum Information Processing*, Taipei, 2024. https://arxiv.org/abs/2308.08785

Monit Sharma, Hoong Chuin Lau and Rudy Raymond. Quantum Enhanced-Simulation Based Optimization for Newsvendor Problems. In Proceedings of the *IEEE Quantum Computing and Engineering Conference* (QCE), Montreal, Canada, 2024.
Presented in *27th International Conf. on Quantum Information Processing* (QIP), Taipei, January 2024. (poster) https://arxiv.org/abs/2403.17389

Monit Sharma, Jin Yan, Hoong Chuin Lau, and Rudy Raymond. Quantum Relaxation for Solving Multiple Knapsack Problems. In Proceedings of the *IEEE Quantum Computing and Engineering Conference* (QCE), Montreal, Canada, 2024. http://arxiv.org/abs/2404.19474

Siong Thye Goh, Jianyuan Bo, Sabrish Gopalakrishnan and Hoong Chuin Lau. Techniques to Enhance a QUBO Solver For Permutation-Based Combinatorial Optimization. In *Genetic and Evolutionary Computation Conference (GECCO) Workshop on Quantum Optimization*, July 2022, Boston, USA. https://dl.acm.org/doi/10.1145/3520304.3533982 (early manuscript in https://arxiv.org/abs/2009.12767)
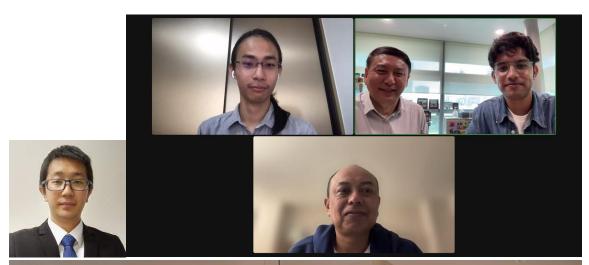
Whei Yeap Suen, Matthieu Parizy and Hoong Chuin Lau. Enhancing a QUBO solver via Data Driven Multi-start and its Application to Vehicle Routing Problem. In *Genetic and Evolutionary Computation Conference (GECCO) Workshop on Quantum Optimization*, July 2022, Boston, USA. https://dl.acm.org/doi/10.1145/3520304.3533988
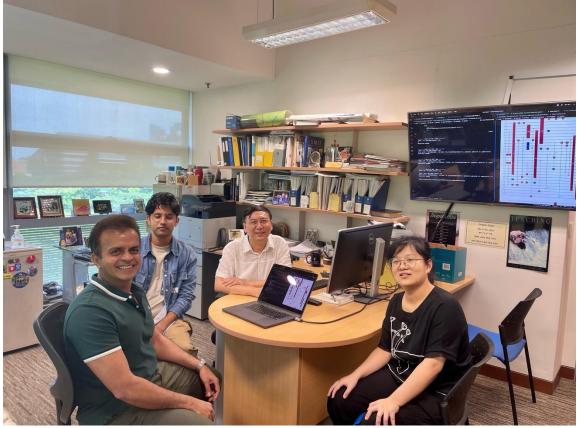
Siong Thye Goh, Jianyuan Bo, Matthieu Parizy and Hoong Chuin Lau. A Recommendation System Approach to Tune a QUBO Solver. In *International Joint Conf. on Artificial Intelligence (IJCAI) Workshop on New Architectures for Search and Optimization*, July 2022, Vienna, Austria. https://sites.google.com/view/naso-2022

Tian Huang, Siong Thye Goh, Sabrish Gopalakrishnan, Tao Luo, Qianxiao Li, and Hoong Chuin Lau QROSS: QUBO Relaxation Parameter Optimisation via Learning Solver Surrogates. In *IEEE 41st International Conference on Distributed Computing Systems Workshops* (ICDCSW), pages 35–40. 2021. https://arxiv.org/abs/2103.10695

Whei Yeap Suen, Chun Yat Lee and Hoong Chuin Lau. Quantum-inspired algorithm for Vehicle Sharing Problem. In Proceedings of the *IEEE International Conference on Quantum Computing and Engineering* (QCE), Virtual, October, 2021. Link

My Quantum Computing group at SMU

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