

An Introduction to Quantum Computing and Quantum Machine Learning with Quantum Parametric Circuits

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Quantum Computing promises to solve specific classes of problems exponentially faster than any possible classical counterpart. However, testing this result in real life requires a large-scale universal error-correcting fault-tolerant quantum computer, which has not yet been built. We live in the age of noisy intermediate-scale quantum computers (NISQ) with several hundreds of noisy qubits. One of the most promising ways of using NISQ devices is Quantum Parametric Circuits (QPC) for various optimization problems (ground state energy estimation, MaxCut, QAOA, etc.). In this talk, I will introduce the basics of quantum computing with parametric circuits and show how to map various problems to QPCs. Afterwards, I will review some results achieved by some of my students.

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