Several results on quantum machine learning D. Dong^{1,2}

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In this talk, we will introduce several results on quantum machine learning. Firstly, we will give an introduction to the area of quantum reinforcement learning. Secondly, we introduce an efficient parameter initialization strategy with theoretical guarantees to enhance the trainability of parameterized quantum circuits. Thirdly, we show that noises may make quantum kernel methods to only have poor prediction capability.

References

- D. Dong, C. Chen, H. Li, T.J. Tarn, Quantum reinforcement learning, IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics) 38, 1207-1220 (2008).
- [2] Y. Wang, X. Wang, B. Qi, D. Dong, Supervised-learning guarantee for quantum AdaBoost, Physical Review Applied **22**, 054001 (2024).
- [3] Y. Wang, B. Qi, C. Ferrie, D. Dong, Trainability enhancement of parameterized quantum circuits via reduced-domain parameter initialization, Physical Review Applied 22, 054005 (2024).
- [4] Y. Wang, B. Qi, X. Wang, T. Liu, D. Dong, Power characterization of noisy quantum kernels, IEEE Transactions on Neural Networks, in press (2025).