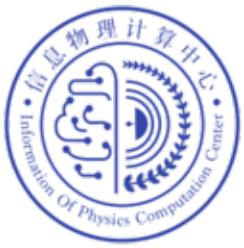

IFCC
信息物理计算中心

Quantum Generative Adversarial Network with Noise

Project Name: Quantum Generative Adversarial Network with Noise

Project member:

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Keywords: Variational Quantum Circuit, Machine Learning

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Submitted by:

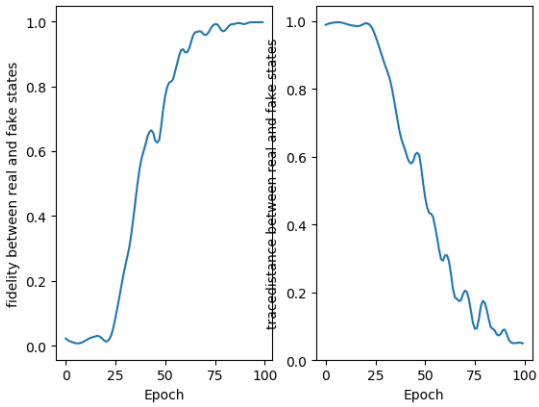
WH REN

Contents

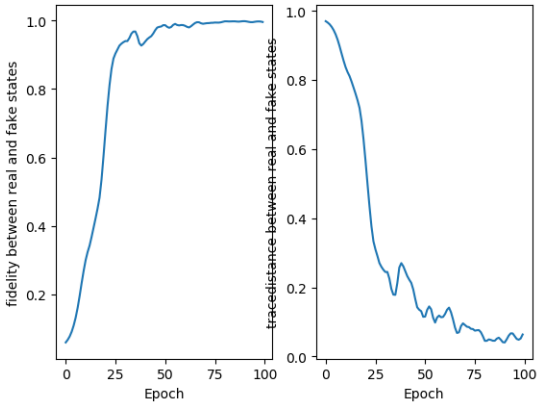
1 Experiment

There are more than five noises in Nielson's book and Wilde's lecture note book.Bit flip and depolarizing channel noise were used by Quantum autoencoders to denoise quantum data. On this basis,I use bit-phase flip noise and phase flip noise to interference the process of producing a pure state.But these noise only inference the number of iterations.In the end, nothing can affect the outcome,and the prosess always approximate the pure state.

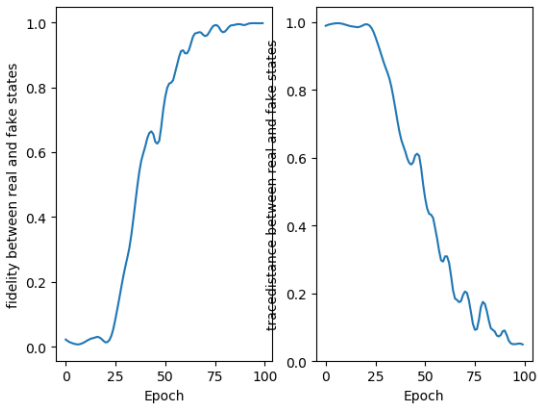
2 Results



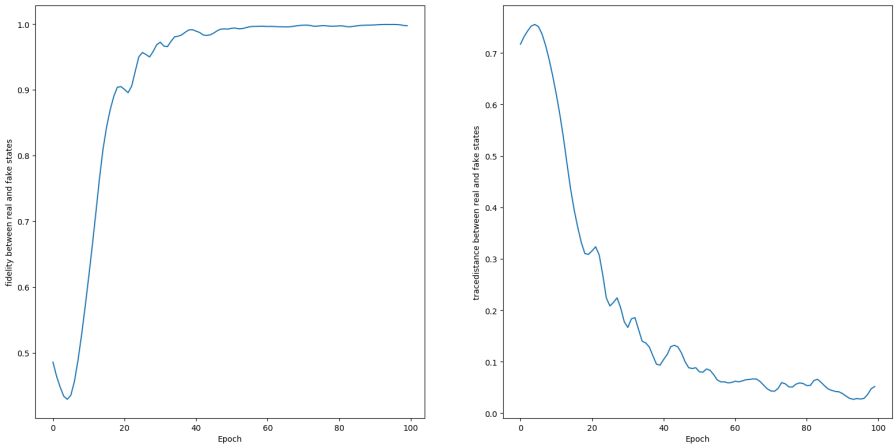
The bit flip noise



The phase flip noise



The bit-phase flip noise



The depolarizing channel noise

3 Next Plan

P: 1 finished quantum circuit code(finished)

2 checking gate gradient descent

3 find the reason why some parameter haven't changed.

4 Reference

References

[1] Benedetti, M., Grant, E., Wossnig, L., and Severini, S. Adversarial quantum circuit learning for pure state approximation. *New Journal of Physics 21*, 4 (2019), 043023.

[2] Shende, V. V., Markov, I. L., and Bullock, S. S. Minimal universal two-qubit controlled-not-based circuits. *Physical Review A 69*, 6 (2004), 062321.

5 Appendix

A Source Code

just add core codes