

HARVARD UNIVERSITY 17 Oxford Street Cambridge, MA 02138

Mathematical Picture Language Seminar

Tuesday, October 18

9:30 a.m. Boston time

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Path-Independent Quantum Gates

Abstract: Ancilla systems are often indispensable to universal control of a nearly isolated quantum system. However, ancilla systems are typically more vulnerable to environmental noise, which limits the performance of such ancilla-assisted quantum control. To address this challenge of ancilla-induced decoherence, we propose a general framework that integrates quantum control and quantum error correction, so that we can achieve robust quantum gates resilient to ancilla noise. We introduce the path independence criterion for fault-tolerant quantum gates against ancilla errors. As an example, a path-independent gate is provided for superconducting circuits with a hardware-efficient design.



Zoom QR Code & Link:

https://harvard.zoom.us/j/779283357?pwd=MitXVm1pYUlJVzZqT3lwV2pCT1ZUQT09

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