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Robust quantum search algorithm via non-unitary Zeno-like dynamics

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We propose and analyze a non-unitary variant of the continuous time Grover search algorithm based on frequent Zeno-type measurements. We show that the algorithm scales similarly to the pure quantum version by deriving tight analytical lower bounds on its efficiency for arbitrary database sizes and measurement parameters. We study the behavior of the algorithm subject to noise, and find that under certain oracle and operational errors our measurement-based algorithm outperforms the standard algorithm, showing robustness against these noises.

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