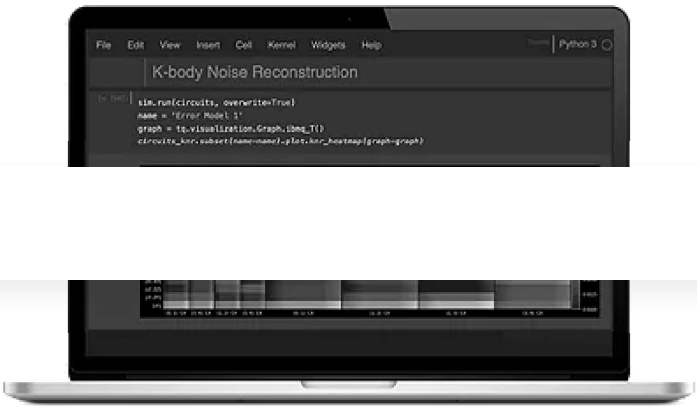
Instrument Measurement Software

Quantum Benchmark

Essential solutions to improve runtime performance of error-prone quantum hardware



KEYSIGHT

Turbocharge Your Quantum Computing

The capacity of the quantum computer to perform meaningful computations is not just determined by the number of qubits, but by the quality of those qubits.

Harnessing the power of quantum computing requires overcoming errors and other imperfections that are inevitable in all quantum computing hardware architectures.

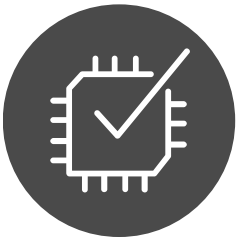
Our proprietary technology is based on years of research by several of the world's leading experts in quantum computing.

True-Q solutions are an essential software layer for both makers and users of quantum computers to improve the runtime performance of error-prone quantum computers.

Our Technology

Quantum Performance Acceleration

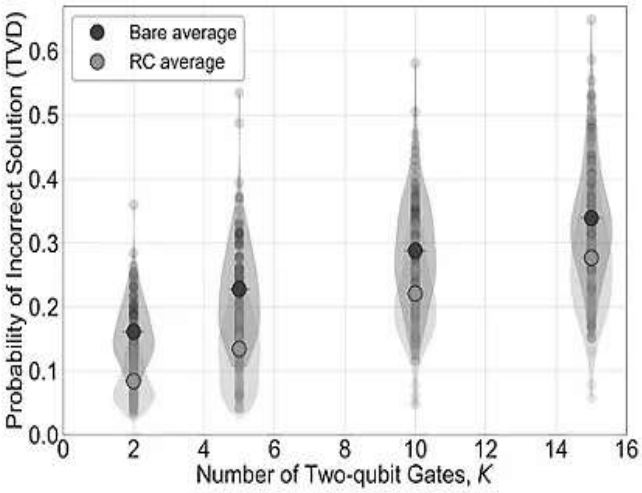
Quantum Error Diagnostics



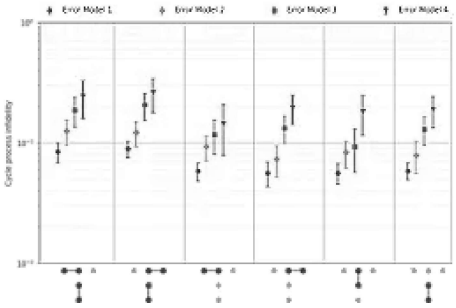
Quantum Performance Validation

Quantum Performance Acceleration

Our software solutions turbocharge quantum computing performance across all platforms and all applications. Industry leaders use our software for run-time error suppression and error-aware compilation, dramatically improving their quantum hardware performance. These tools are necessary for any serious user aiming to understand and achieve quantum advantage for their applications of interest.



Randomized compiling for scalable quantum computing on a noisy superconducting quantum processor. *arXiv preprint arXiv:2010.00215 (2020)*

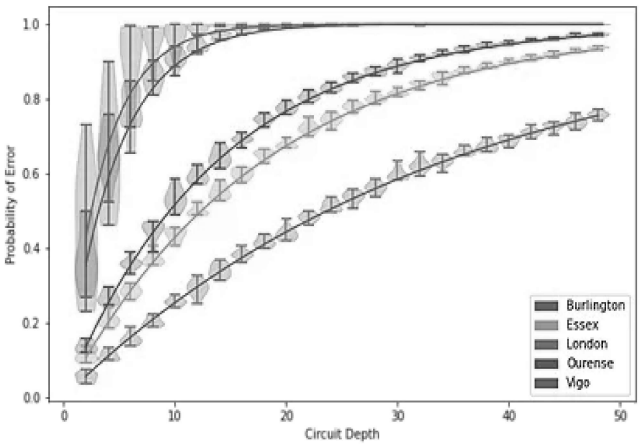


Quantum Error Diagnostics

Our software system delivers error diagnostics to understand and eliminate the error processing that occurs across all qubits and the duration of the quantum circuit. Using diagnostic tools enables quantum hardware makers to better understand the noise present in their quantum computers. With comprehensive error diagnostics, the most advanced features of our error-aware compiler deliver dramatic improvements to quantum hardware performance.

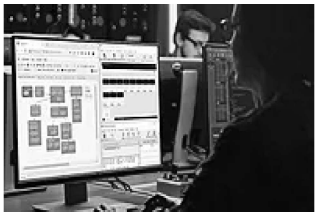
Quantum Performance Validation

For both users and makers of quantum computers, our software system enables optimization and validation of the capacity of quantum hardware platforms to deliver valid solutions for their applications of interest. Our software solves the mission-critical challenge of validating if quantum hardware is able to execute a user-supplied algorithm to a user-specified precision to deliver quantum advantage.



Created using IBM Quantum

Quantum Benchmark Solutions



True-Q Design for QC Makers

- Speed up your hardware design and optimize your pulse engineering with comprehensive and efficient error reconstruction routines that quickly identify all performance-limiting errors
- True-Q Design provides a solution suite of fast, efficient randomized and cycle benchmarking tools to automate and optimize the tune-up and calibration process for elementary gates and gate cycles
- The True-Q compiler compresses and synthesizes arbitrary quantum circuits to any specified gate sets

True-Q Accelerate for QC Users

- True-Q API and SDK expands capabilities and streamlines your quantum computing experience with a user-friendly interface to all quantum computing backends
- True-Q transpiler automatically synthesizes your circuits into any platform's native gates
- True-Q compiler's native error suppression, global error aware qubit allocation/synthesis, and readout correction provide optimal circuit performance on unpredictable and error-prone hardware
- True-Q certification tools validate the accuracy of the hardware execution to gain confidence in your quantum computing solutions
- Accelerate towards quantum advantage with expert support and consulting services from the Quantum Benchmark team

True-Q Ultimate for QB Makers and Users

- True-Q Ultimate for QB makers and users combines all the capabilities of both the accelerate and design features to turbocharge your quantum computing experience with a user-friendly interface to all quantum computing backends.
- True-Q transpiler, compiler, certification tools, and error reconstruction routines bundle together to provide a solution suite of efficient tools built to turbocharge your quantum computing solutions.
- Accelerate towards quantum advantage with expert support and consulting services from the Quantum Benchmark team

Consulting Services for QC Stakeholders

- Understand and explore the true opportunities and challenges of the quantum computing revolution
- Ask about our unique expertise in assessing hardware platforms, our cross-platform benchmark comparisons, and the assessment of each platform's roadmap towards quantum advantage

Featured Resources

True-Q Solutions for End-Users

This flyer helps QC users understand and optimize QC platform capabilities.

True-Q Solutions for QC Makers

This flyer describes how to optimize capabilities of a quantum computing platform.

Quantum Solutions - True-Q

This video presents a product tour of the True-Q software product.

True-Q Manual

This document presents installation and user instructions for the True-Q software product.

True-Q Technical Overview

True-Q software solutions provide state-of-the-art methods to equip the QC community to identify and mitigate performance-limiting effects.

"Quantum Benchmark's True-Q software system and the Quantum Benchmark support team have provided us with novel insights into t performance of our quantum gate operations. We look forwarc continuing to work with them to develop a deep understanding c processors as we scale."

Dr. Julian Kelly, Quantum Research Scientist at Google's Quantum AI

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