Google AI

Quantum Supremacy Using a Programmable Superconducting Processor

Objective

Building quantum hardware and software by developing quantum processors and algorithms to solve theoretical and practical problems faster.

Google AI

It would take traditional computers 10, 000 years to solve a computation problem, but Google AI developed a 54-qubit processor known as "Sycamore," that can compute in 200 seconds.

Focus Areas

Superconducting Qubit Processors

Qubits with chip-based scalable architecture targeting two-qubit gate error less than 0.5%.

Quantum Simulation

Focusing on quantum algorithms for creating a system where electrons interact in chemistry and materials science.

Quantum Neural Networks

Implementation of a quantum neural network on future processors and understanding its possible advantages

Qubit Metrology

Reducing two-qubit loss below 0.2% ito improve error correction

Quantum Assisted Optimization

Developing hybrid traditional quantum solvers for approximate optimization.

Quantum Simulation

Advance design and physics through accurate simulations of chemistry.

Quantum Machine Learning

Development of traditional quantum machines on near-future quantum devices

Quantum Optimization

Quantum-classical optimization to benefit industries like aerospace and automotive

Open Source Frameworks

Framework to build and test noisy intermediate scale quantum (NISQ) algorithms on future quantum processors.

Platform for converting chemistry and materials science into quantum circuits to be used on other platforms

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