

The problem with quantum computers

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By now, most people have heard that quantum computing is a revolutionary technology that leverages the bizarre characteristics of quantum mechanics to solve certain problems faster than regular computers can. Those problems range from the worlds of mathematics to retail business, and physics to finance. If we get quantum technology right, the benefits should lift the entire economy and enhance U.S. competitiveness.

The promise of quantum computing was first recognized in the 1980s yet remains unfulfilled. Quantum computers are exceedingly difficult to engineer, build, and program. As a result, they are crippled by errors in the form of noise, faults, and loss of quantum coherence, which is crucial to their operation and yet falls apart before any nontrivial program has a chance to run to completion.

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