**EXPLORING THE POTENTIAL OF QUANTUM COMPUTING**

Today’s computers help and entertain us, connect us with people all over the world, and allow us to process huge amounts of data to solve problems and manage complex systems. However, there are problems that today’s systems will never be able to solve. For challenges above a certain size and complexity, we don’t have enough computational power today to tackle them. To stand a chance at solving some of these complex problems, we need a new kind of computing: one whose computational power scales exponentially as the system size grows. Quantum computation is an emerging field of research at the intersection of computer science, information theory and quantum physics. The idea behind quantum computers is to take the phenomena of the quantum realm and use it to our advantage to create better machines. For instance, if a task requires us to find one correct answer out of 100 million choices, an ordinary computer would go through 50 million steps to do so whereas a quantum computer would only go through 10,000. Today, real quantum computers can be accessed through the cloud, and many thousands of people have used them to learn, conduct research, and tackle new problems. Quantum computers can one day provide breakthroughs in many disciplines, including materials and drug discovery, the optimization of complex systems, and artificial intelligence. But to realize those breakthroughs, and to make quantum computers widely useable and accessible, we need to reimagine information processing and the machines that do it.

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