

D-Wave Demonstrated World's First Commercial Quantum Computer

February 14 2007

The world's first commercially viable quantum computer was demonstrated yesterday in Silicon Valley by D-Wave Systems, Inc., a privately-held Canadian firm.

Quantum computing offers the potential to create value in areas where problems or requirements exceed the capability of digital computing, the company said. But D-Wave explains that its new device is intended as a complement to conventional computers, to augment existing machines and their market, not as a replacement for them.

Company officials formally announced the technology at the Computer History Museum, in the heart of Silicon Valley, in a demonstration intended to show how the machine can run commercial applications and is better suited to the types of problems that have stymied conventional (digital) computers.

“D-Wave’s breakthrough in quantum technology represents a substantial step forward in solving commercial and scientific problems which, until now, were considered intractable. Digital technology stands to reap the benefits of enhanced performance and broader application,” said Herb Martin, chief executive officer.

Quantum-computer technology can solve what is known as “NP-complete” problems. These are the problems where the sheer volume of complex data and variables prevent digital computers from achieving results in a reasonable amount of time. Such problems are associated

with life sciences, biometrics, logistics, parametric database search and quantitative finance, among many other commercial and scientific areas.

Quantum technology delivers precise answers to problems that can only be answered today in general terms. This creates a new and much broader dimension of computer applications,” Martin said.

“Digital computing delivers value in a wide range of applications to business, government and scientific users. In many cases the applications are computationally simple and in others accuracy is forfeited for getting adequate solutions in a reasonable amount of time. Both of these cases will maintain the status quo and continue their use of classical digital systems,” he said.

“It’s rational to assume that quantum computers will always contain a digital computing element thereby increasing the amortization of investments already made while expediting the availability of the power of quantum acceleration,” he said.

The idea of a computational device based on quantum mechanics was first explored in the 1970s and early 1980s by physicists and computer scientists such as Charles Bennett of IBM’s Thomas J. Watson Research Center, Paul Benioff of Argonne National Laboratory, David Deutsch of the University of Oxford, and Richard Feynman of the California Institute of Technology. But to make the technology commercially applicable required the full-scale, full-time business effort of an interdisciplinary team such as that organized by D-Wave Systems.

D-Wave overcame this challenge in part by using the processes and infrastructure associated with the semiconductor industry. This and components such as a new type of analog processor, one that uses quantum mechanics rather than the conventional physics associated with digital processing, to drive the computation.

D-Wave's approach allows the building of “scalable” processor architectures using available processes and technologies. In addition, its processors are computationally equivalent to more standard devices. Any application developed for one type of quantum computer can be recast as an application for the other.

D-Wave intends to deliver products to end users via a channel-marketing and partnerships with major-brand corporations with existing customer relationships and vertical-industry expertise, according to Martin.

He added that D-Wave is pursuing a partnership strategy as well to develop and deliver the software applications necessary to attract customers faced with solving the kinds of NP-complete problems for which quantum computing is ideally suited.

More info: www.dwavesys.com/index.php?page=technology

Source: D-Wave Systems

Citation: D-Wave Demonstrated World's First Commercial Quantum Computer (2007, February 14) retrieved 20 March 2024 from <https://phys.org/news/2007-02-d-wave-world-commercial-quantum.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--