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David Wiener: Quantum computers will be here before we even know it

By David Wiener | Special to The Tribune

The past few weeks have been momentous for those of us tracking and preparing for the arrival of quantum supremacy — the tipping point when quantum computers functionally outperform classical computers. Among their many capabilities, these machines will have the power to unlock the digital encryption we use today.

That matters *right now*. Bad actors and nation states have been harvesting communications for years knowing that technology will soon allow them to unlock the secrets encrypted within those messages.

Glenn Gerstell, general counsel for the National Security Agency, addressed the global stakes in a September New York Times Op-Ed, “Imagine the overwhelming leverage that the winner would have — such a decryption ability could render the military capabilities of the loser almost irrelevant and its economy overturned.”

When the chief adviser for the most powerful intelligence organization the world has ever known publicly cautions that quantum computers will be capable of shifting the global balance of power, it’s time to start paying attention.

The only truly unknown factor is when quantum supremacy will be achieved. Estimates vary from five to 20 years, with a loose scientific consensus that quantum supremacy is at least a decade away. Yet...

Google and NASA claimed they achieved quantum supremacy last month.

A paper authored by a NASA senior research scientist was posted on the federal agency's Ames Research Center website (Google and NASA partner in quantum computer testing) announcing that a quantum processor ran a calculation in 200 seconds that would take Summit, the fastest supercomputer in the world, 10,000 years to perform. To put that in perspective, it would take Summit — a computer *80 million times more powerful than a Macbook Pro* — 10 millennia to do what a nascent quantum computer can do in *less than 4 minutes*.

Mysteriously, the research paper vanished within hours of its appearance. Neither Google nor NASA responded to reporter queries and neither has issued so much as an acknowledgement that the leaked paper exists, let alone contains the truth.

Flatly ignoring what may be the greatest technological achievement in modern history seems like odd behavior, but not if you consider the stakes.

The major quantum computing players are among the wealthiest, most successful countries and companies on Earth: Google, IBM, Intel, Alibaba, China, Russia and the United States. Each is deeply and powerfully incentivized to reach quantum supremacy first. As Jim Clarke, Intel's director of quantum hardware said, "This feels like my generation's space race."

China is a notoriously secretive nation whose technological advancements remain concealed until being sprung, fully realized, upon the world stage. Russia, which, like China, has invested billions of dollars in quantum technology, remains steadfastly engaged in the world's most absurd and determined global disinformation campaign.

Here in America, bleeding-edge technology is almost always clandestine. For companies working concurrently on similar technology, secrecy is an essential component of competition.

Broadcasting too much information about progress gives competitors the opportunity and motivation to redouble their own efforts.

Considering the players and the stakes surrounding quantum computers, why would anyone — whether a government or company — tip their hand?

As Gerstell said, “The strategic advantage here would be for one country to surreptitiously acquire such a capability and maintain it for perhaps several years or more.”

Therein lies the true endgame — not just quantum supremacy, but *quantum secrecy* that can be leveraged indefinitely without notice. The wonder isn’t that the NASA paper summarily vanished, but that it ever appeared in the first place.

We don’t know when quantum supremacy will be achieved, but one thing seems certain. It will happen *before we even know it*.



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