

Google Willow Unveiled: Unbelievably Powerful Quantum Superchip

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That claim is well-founded. Willow is only about 4 square centimeters in size, but it boasts 'unbelievable' speed. With 105 qubits, Willow has achieved the best performance in both quantum error correction and random circuit sampling. Google claims that its new breakthrough in Willow can reduce errors exponentially as it scales by using more qubits.

The Willow chip is built at Google's new advanced manufacturing facility in Santa Barbara, which was built from the ground up to be solely dedicated to building quantum processors. The Mountain View company has optimized several aspects, including chip architecture, fabrication, gate development, calibration, and more, to achieve its incredibly impressive performance.

Google notes that Willow solved a standard benchmark test in under 5 minutes. If that doesn't sound like much, consider that it would take a current-generation supercomputer more than 10^{25} years to solve the same test. It's no exaggeration to say that Willow could make state-of-the-art supercomputers suddenly feel like 'classics'.

Google's ambition is to build quantum computing systems capable of solving complex contemporary problems such as safe fusion energy, climate change, astronomy, or applied medicine. There is still a long way to go, but Google is optimistic that the Willow chip generation can turn those applications into reality.

Willow's breakthrough performance brings us closer to realizing the full potential of quantum computing. Microsoft recently announced a new partnership through which it is trying to create the most powerful quantum machine ever.

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