Google’s Quantum Computing Breakthrough

Source: BS

Google has unveiled a **new quantum computer** featuring a chip called **Willow**, capable of performing calculations in **under five minutes** that would take the most advanced **supercomputers** over **10 septillion years** (a length of time that exceeds the age of the known universe).

- This achievement, described as “**quantum supremacy**,” signifies that Google’s quantum computer can perform tasks beyond the reach of traditional computers.
    - However, these tasks, such as generating random numbers, are **primarily theoretical** and lack immediate practical applications like **drug discovery**.
- A significant breakthrough includes surpassing the **"error correction threshold,"** an important milestone toward reducing computational errors and enabling practical applications.
- Scientists are now shifting focus toward achieving "**quantum advantage**," where quantum computers could drive advancements in practical fields like AI, chemistry, and medicine.
- **Traditional Computing vs Quantum Computing:** Traditional computers process information as **"bits,"** each representing either a 1 or a 0, to perform calculations.
    - In contrast, **quantum computers** leverage **"qubits,"** which can exist as both 1 and 0 simultaneously, harnessing the principles of quantum mechanics.
    - This unique property **allows qubits to exist in multiple states** at once, enabling exponential increases in computational power.

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