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SELECTED NEWS

IBM Unveils Qiskit 1.0: A New Era in Quantum Computing

The launch of Qiskit 1.0 is a significant milestone representing IBM's ongoing commitment to advancing quantum computing technology. It brings enhanced performance, stability, and usability to the quantum computing community, making it more accessible and practical for a broader range of applications.

Key Highlights of Qiskit 1.0:

- **High-Performance Computing:** Qiskit 1.0 is engineered to efficiently manage and transpile quantum circuits that exceed 100 qubits, paving the way for future quantum systems capable of handling more than 1000 qubits. This significant enhancement in computing power expands quantum systems' potential applications and capabilities.

- **Streamlined Architecture:** The architecture of Qiskit has been optimized by removing the previous meta package structure and dividing Qiskit. algorithms into a separate package. This restructuring aims to improve the codebase's maintainability, focus, and long-term performance.

- **Stable API:** Introducing a more stable API and a new release and versioning cycle with Qiskit 1.0 ensures fewer breaking changes, providing a more reliable platform for developers engaged in quantum computing projects.

- **Primitives Execution Model:** A notable feature of Qiskit 1.0 is its execution model based on primitives, which facilitates a more efficient and scalable approach to interacting with quantum hardware. This model allows for refactoring existing functionalities and a primitives-first strategy for new developments.

- **Enhanced Capabilities and Community Engagement:** By introducing a transpiler plugin interface and the Qiskit Ecosystem program, IBM encourages the community to extend Qiskit's capabilities further, fostering an environment of collaborative innovation.

Performance Improvements:

Qiskit 1.0 showcases substantial improvements in speed and memory usage. The adoption of Rust code has led to faster operation of Qiskit 1.0 features compared to previous versions, with the transpiler being notably quicker and more efficient. Additionally, there's a significant reduction in memory usage, which is essential for handling larger quantum circuits.

Taiwan's Academia Sinica Unveils a 5-Qubit Superconducting Quantum Computer

In a notable advancement within the realm of quantum computing, Academia Sinica in Taiwan has reached a significant milestone by successfully developing and producing its own 5-qubit superconducting quantum computer. This achievement underscores the immense potential of quantum computing, which leverages the principles of quantum mechanics to facilitate computations that far exceed the capabilities of current supercomputers.

Nations worldwide, recognizing the transformative impact quantum computing could have across various sectors, have been vigorously pursuing research and development initiatives in this avant-garde field. Last year, Academia Sinica broke through several obstacles related to quantum chip fabrication, control systems, and measurement techniques. By October, they had unveiled a 5-qubit superconducting quantum computer, a pioneering project conceived and realized in Taiwan. This quantum computer is now accessible online to collaborators engaged in related projects.

This initiative is part of a broader quantum technology program supported by the National Science and Technology Council. The project's success ahead of schedule—surpassing the original goal of developing a 3-qubit quantum computer by February of the following year with a 5-qubit version—highlights the perseverance and dedication inherent in scientific research. Overcoming foundational challenges through patient effort eventually leads to groundbreaking advancements in application.

The achievement of Academia Sinica not only marks a significant step forward for Taiwan in the quantum research and development arena but also aims to stimulate further innovation and growth within the quantum technology sector. Drawing in more domestic and international talent, this effort seeks to position Taiwan at the forefront of quantum technology advancements, showcasing the island's potential to contribute significantly to this revolutionary field.

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