

NTU Q

IBM INTRODUCES IBM QUANTUM PROTOTYPES FOR USERS TO TRY OUT NEW CUTTING EDGE QUANTUM ALGORITHMS

IBM Quantum Prototypes is a collaboration between developers and researchers that will give users access to prototypes from cutting-edge research, which aren't ready yet to be integrated into the Qiskit SDK. This new capabilities can help you get access to these new tools faster, and use these in your own work. IBM has already announced two type of algorithms to IBM Quantum prototypes called Entanglement Forging and Quantum Kernel Training.

1. Entanglement Forging is an algorithm which splitting large quantum circuit into pieces, running the pieces in quantum computer separately, and then using classical computer to combine the pieces together. [Demo](#), [Video](#)
2. Quantum Kernel Training is for machine learning applications. Users will using a quantum kernel for binary classification task. [Demo](#), [Video](#)

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DUKE UNIVERSITY AND IONQ DEVELOP NEW TYPES OF N-QUBIT GATES

Typically, the n-qubit gates, such as Toffoli Gate, are composed of single qubit gates and 2-qubit gates. However, there is a problem because each level adds to the error rate and the resulting error rate of the total circuit will be much worse.

Recently, Duke and IonQ have developed a new way to implement various types of N-Qubit gates in one level. Using these new types of gates can potentially simplify and speed up the function while simultaneously offering a reduced error. It can potentially be used on all the qubits in the ion trap chain. This can potentially be a significant benefit to programmers, depending upon the particular algorithm they are implementing.

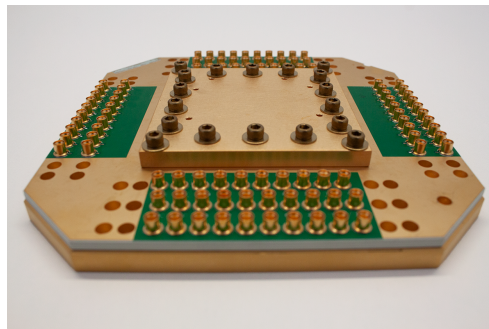
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RIGETTI COMPUTING ANNOUNCES COMMERCIAL AVAILABILITY OF 80-QUBIT ASPEN-M SYSTEM AND RESULTS OF CLOPS SPEED TESTS

Rigetti announced the commercial availability of its 80-qubit quantum system, Aspen-M. The system is available today to the company's direct and distribution customers through Rigetti Quantum Cloud Services (QCS).

Aspen-M is now available on Rigetti Quantum Cloud Services and will support a number of Rigetti collaborations taking place with both enterprise and public sector customers. For other platforms, Aspen-M is available for users on Amazon Braket, and Rigetti expects it be available through Azure Quantum, Strangeworks QC™ and Zapata's Orchestra™ platform in the coming months.

Rigetti reported the performance of its Aspen-M system based on Circuit Layer Operations Per Second (CLOPS). Conducting tests for 100 shots, Aspen-M system demonstrated a CLOPS of 892. These results show that current Aspen-M system perform better than their 40-qubit Aspen-11 system as the number of qubits in the system increases.



Rigetti Aspen-M Processor (Source:Rigetti)

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計畫補助單位：



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