

Alice & Bob Accelerates Quantum Error Correction with NVIDIA CUDA-Q

BOSTON, MA, UNITED STATES, March 16, 2026 /EINPresswire.com/ -- Alice & Bob announces accelerated quantum error correction decoding through GPU-accelerated simulation using the [NVIDIA CUDA-Q](#) platform, marking a step toward scalable fault-tolerant quantum computing.



Through GPU-accelerated simulation Alice & Bob achieved a runtime time of 1 hour 57 minutes for the decoding of simulated syndrome data of its Elevator Codes, a new error correction



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US General Manager, Alice & Bob

architecture developed by the company that uses a concatenation-based scheme specifically tailored to biased noise qubits. The result represents a x9.25 speed-up compared to CPU-based decoding implementations, which required 18 hours 2 minutes for the same workflow. The GPU-accelerated approach maintains identical logical error performance, demonstrating that there is no performance degradation despite the greatly accelerated decoding.

Quantum error correction depends on fast classical processing to interpret measurement outcomes in real

time. As quantum processors scale, evaluating error correction performance under realistic conditions becomes increasingly computationally demanding. By leveraging GPU-accelerated simulation through CUDA-Q, Alice & Bob has demonstrated reduced decoding times within large-scale simulation workflows, enabling more efficient study of fault-tolerant architectures.

The collaboration builds on the existing relationship between Alice & Bob and NVIDIA. In June 2025, the companies announced integration of NVIDIA CUDA-Q into Dynamiqs, Alice & Bob’s QPU simulation library, enabling GPU-accelerated quantum simulations.

The two companies will continue to work together to explore how the use of GPUs and AI can advance scalable quantum system development.

Juliette Peyronnet, US General Manager, Alice & Bob, says: “Fault tolerance is a system-level

challenge that requires strong classical infrastructure alongside quantum hardware. By working with partners like NVIDIA, we are accelerating the large-scale simulations needed to design and refine scalable quantum architectures.”

Tim Costa, Vice President and General Manager for Quantum, NVIDIA says: “Scalable quantum computing will depend on seamless integration between quantum hardware and accelerated computing. Alice & Bob’s use of CUDA-Q has allowed them to simulate, validate, and iterate on fault-tolerant architectures more efficiently, bringing them close to useful quantum applications.”

Sam Stanwyck, Group Product Manager, Quantum Computing, NVIDIA presented the use case at NVIDIA GTC, Monday March 16 in a session titled Integrating AI and Quantum Computing to Accelerate the Future of Supercomputing, more information can be found [here](#).

About Alice & Bob

Alice & Bob is a quantum computing company based in Paris and Boston whose goal is to create the first universal, fault-tolerant quantum computer. Founded in 2020, Alice & Bob has raised €130 million in funding and employs more than 200 people.

Advised by Nobel Prize winning researchers, Alice & Bob specializes in cat qubits, a technology developed by the company’s founders. Demonstrating the power of its cat architecture, Alice & Bob recently showed that it could reduce the hardware requirements for building a useful large-scale quantum computer up to 200 times compared with competing approaches. For more information, visit www.alice-bob.com.

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