

Alice & Bob Enable Companies to Prepare for Practical Quantum Computing with Industry-First Logical Qubit Emulator

Felis provides toolbox for quantum computer scientists to work with fault-tolerant algorithms and predict the behavior of logical qubits

PARIS, ÎLE-DE-FRANCE, FRANCE, November 26, 2024 /EINPresswire.com/ -- [Alice & Bob](#), a global leader in the race for fault-tolerant quantum computing, today announced Felis 1.0, its toolbox featuring the first-ever logical qubit emulator. Felis allows users to prepare for impactful quantum computing today by facilitating the transition from NISQ to fault-tolerant algorithms.

"Many business leaders have yet to realize that the quantum algorithms their teams develop will not work as-is on an industry-grade quantum computer," said Théau Peronnin, CEO of Alice & Bob. "Felis addresses a critical educational gap in the quantum ecosystem, allowing users to truly understand how to adapt algorithms so they can run on logical qubits and how to optimize them for fault-tolerant hardware."

While logical qubits are necessary to achieve the level of reliability quantum computers need to be useful, they also come with noticeable differences with respect to today's quantum hardware. Quantum algorithm developers will need to recompile their algorithms and reduce the overhead introduced by error correction to a bare minimum. As a result, logical qubit emulation is a key transitional tool to examine how future quantum computers will differ from today's devices, to better understand what to expect from them, and to start optimizing algorithms for them.

Built on top of Qiskit, the most popular quantum computing framework, Felis leverages the power of the Qiskit ecosystem while adding cat-qubit-specific capabilities. It enables the



execution of logical quantum algorithms and workflows designed for useful quantum computers based on cat qubits, offering a comprehensive platform for algorithm development and logical qubit experimentation.

Felis users can tune hardware parameters and error rates to model their algorithms on different expected hardware maturity, both in the short- and long-term. The goal of Felis' flexibility is the exploration of quantum error correction techniques with logical qubits based on the innovative cat qubit. This will, in turn, allow researchers to observe potential gains in hardware efficiency and on overhead enabled by Alice & Bob's platform.

Additionally, Alice & Bob has updated Felis to make it compatible with IBM Qiskit 1.2 so developers can leverage its latest improvements, including faster compilation and emulation.

Felis' logical qubit emulator is now also available as an execution backend on the Classiq platform. Using Classiq's powerful synthesis engine, quantum algorithm developers can now optimize their circuits for logical qubits and study their sensitivity to noise.

"This integration combines Alice & Bob's Felis toolbox, an invaluable resource to explore the practical implications of logical qubits with [Classiq's platform](#) and synthesis engine. The partnership allows developers and researchers to bridge today's quantum innovations with tomorrow's fault-tolerant breakthroughs," said Nir Minerbi, CEO of Classiq Technologies.

Because some quantum circuits are too large to emulate for current classical and quantum hardware alike, Alice & Bob's Felis will shortly be equipped with a resource estimator for cat qubits that projects the qubits and resources required for building large quantum circuits. This resource estimator already exists as a standalone application.

You can start using Felis Logical Emulator right now on [Alice & Bob's GitHub](#) or on the Classiq's platform today.

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 already raised €30 million in funding, hired over 100 employees and demonstrated experimental results surpassing those of technology giants such as Google or IBM. Alice & Bob specializes in cat qubits, a pioneering technology developed by the company's founders and later adopted by Amazon. 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 by up to 200 times compared with competing approaches. Alice & Bob first cat qubit chip, Boson 4, is available for anyone to test through cloud access. Felis is available on GitHub, as well as the resource estimator. Follow Alice & Bob on LinkedIn, X or YouTube, visit their website www.alice-

bob.com, or join The Cat Tree on Slack to learn more.

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