Quandela develops a connector for programming and manipulating qubits on photonic processors

Paris, 27 July 2022 - It's a world first. Quandela, a French start-up specialising in quantum photonics, has announced the release of a connector that makes its Perceval software available to scientists and developers of quantum computers. It is now possible for them to run qubit code on photonic processors, from third-party frameworks, and thus benefit from all the advantages of photonic quantum computing.

Perceval[*], the software suite developed and launched in March 2022 by Quandela, is an open-source software platform for photonic quantum computing. It allows users to define photonic quantum circuits, to implement and develop algorithms and protocols, and to run these on a variety of optimized simulation backends, and later this year on real photonic quantum processors.

The latest release of Perceval introduces connectors. These open up the world of photonic processing to third party frameworks tailored for gate-based qubit quantum processing (e.g., Qiskit). The release also incorporates some of the latest advances in photonic quantum computing, including the LOv-calculus, a graphical rewriting tool that in particular enables automated simplification of photonic quantum circuits.

"*Perceval's connectors will allow quantum computer scientists and developers to run existing qubit code on photonic processors, combining the best of qubit and photonic quantum processing, opening up exciting possibilities for hybrid and cross-platform algorithms, and for the first time bringing photonic tools like the LOv-calculus for circuit rewriting and simplification to the wider quantum computing community*" clarifies Shane Mansfield, Chief Research Officer at Quandela

Quandela's photonic technology has many advantages compared to other quantum technologies, as photons are not affected by environmental perturbations, which allows photonic processors to operate largely at room temperature. Furthermore, the quality of the single photon sources developed at Quandela brings us considerably closer to scalable photonic quantum computers, removing one of the main obstacles to their development.

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[*] Perceval is a software suite in Python integrating optimized simulation libraries

About Quandela

Co-founded in 2017 by Pascale Senellart (CNRS researcher at the *Center for Nanoscience and Nanotechnology* of the CNRS and the University of Paris-Saclay and 2014 CNRS Silver Medalist), Valérian Giesz (engineer and PhD in quantum optics), and Niccolo Somaschi (PhD in semiconductor nanotechnologies), Quandela, a leader in quantum photonics, is developing a full-stack photonic quantum computer.

The company began its activity by supplying high-performance single photon sources to academic laboratories around the world (Australia, Austria, the Netherlands, Italy, etc.). Since 2020, after a first round of financing, and a second in 2021 of €15M from the deeptech investment fund Omnes, the Defence Innovation Fund managed by Bpifrance and subscribed by the Defence Innovation Agency (AID), and the quantum technologies fund Quantonation, Quandela has considerably reinforced its R&D teams. Quandela is a complete player in photonic quantum computing and now boasts more than thirty doctors and engineers in semiconductors, quantum optics, quantum information, algorithms, software development and computer science.

In 2022, Quandela released its photonic quantum computing software platform *Perceval* and signed a hosting partnership with OVHcloud to build a user community. Today, the company offers a cybersecurity enhancement solution with a 2-qubit quantum processor and will make its first 6-qubit NISQ quantum computer available on the cloud from autumn 2022. Quandela also supports and advises companies in the exploration and development of early use cases.

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