Quantum Machines and Hamamatsu Photonics Team Up for Enhanced Quantum Computing Control

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The combined solution integrates OPX with ORCA Cameras to provide ultra-fast camera readout capabilities for cold atoms and trapped-ions qubits.

Quantum Machines (QM), the leading provider of processor-based quantum controllers™ today announced the integration of its advanced Observe, with Hamamatsu's high-speed ORCA® - Quest camera. The collaboration between Quantum Machines and Hamamatsu pushes the boundaries of quantum computation, communication, and sensing.

QM's Observe is a high-speed camera interface with an image processor that complements the OPX quantum control suite. This combination of Observe and ORCA cameras provides ultra-fast camera readout capabilities for cold atom and trapped-ion qubits. The integration not only boosts the speed but also maintains flexibility, allowing researchers to interface with personal computers for additional image processing capabilities.

Key Advantages:

- **Real-time Image Processing:** The solution achieves a market-leading image processing speed, offering quantum researchers unprecedented control over their experiments.
- **Seamless OPX Integration:** The integration with QM's OPX facilitates effortless programming using the QUA language, ensuring feedback times below 100 μs, not including camera exposure and related delays.
- **Trusted and Proven:** The system's reliability is evidenced by its adoption in prestigious laboratories and by leading quantum computing adopters globally.

Compatibility and Performance:

- OPX+ supports Camera Link and CoaXPress interfaces and is compatible with leading quantitative CMOS (qCMOS) cameras such as Hamamatsu's.

- The Hamamatsu ORCA-Quest offers enhanced scalability thanks to its smaller pixel size and higher resolution. This improvement allows for the utilization of more compact optical configurations while also increasing the number of detectable samples.
- The solution guarantees real-time, deterministic frame acquisition and image processing.

"*The collaboration between QM and Hamamatsu is a game-changer, enhancing the precision and speed of quantum measurements*," said Itamar Sivan co-founder and CEO of Quantum Machines. "*This synergy between our technologies paves the way for advancements in quantum computing, bringing us closer to realizing its full potential. We're not just enhancing our system's capabilities; we're redefining the boundaries of what's possible in quantum research*."

 "*Hamamatsu is highly enthusiastic about the potential of photonics in the quantum world as a leading photonics company. Our collaboration with Quantum Machines has accelerated the development of our camera systems, optimized for quantum computing. We are proud to announce the beginning of an adventure towards fault-tolerant quantum computing, together with Quantum Machines*," said Tadashi Maruno, Representative Director, President and Chief Executive Officer of Hamamatsu Photonics.

About Hamamatsu's ORCA-Quest:

The ORCA-Quest camera is designed to excel in low-light conditions, providing high-quality images and reliable data through its exceptionally low read noise at effective row readout times of 3.6 microseconds. This feature is especially critical when detecting minimal photon emissions, ensuring no detail is lost in the noise. www.hamamatsu.com

About Quantum Machines OPX:

The OPX family of processor-based quantum controllers stands out for its comprehensive control capabilities, specifically tailored for scaling quantum computing to 1,000 qubits and beyond. It supports the most complex quantum programs across various quantum systems, thanks to its user-friendly programming and swift execution. www.quantum-machines.co

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