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About Orange Quantum Systems

Orange Quantum Systems is a spin-off of QuTech that accelerates the research on quantum physics and the development of quantum technology for quantum computing. We support R&D labs with custom characterization and calibration software and develop customized full-stack setups for R&D into quantum computing. Orange Quantum Systems is part of Quantum Delft's world-leading ecosystem for innovation in quantum technologies.

The project

In order to provide a measure of how well a quantum computer executes a quantum circuit, benchmarking protocols have been developed. One such benchmark is the standard randomized benchmarking with Clifford group. In this project you will be implementing the randomized benchmarking protocol as well as more variants identified through [Helsen et al, 2020] for use in experiment within the Quantify framework. If time allows, the developed protocols will be tested on real quantum hardware developed by Orange Quantum Systems and our partners.

Required skills and expertise

We are looking for a motivated MSc. student (applied physics, computational science, or engineering) with an interest in (experimental) quantum physics and programming. For this internship we require that you:

- Have completed some courses in quantum information processing and are familiar with the basics of quantum-state and quantum-process tomography.
- Are familiar with common scientific Python libraries and data visualization (e.g., scipy, numpy, matplotlib, jupyter, etc.).
- Are interested in further developing your software engineering skills (version control, test-driven development, documentation).

What we offer

We offer a paid internship in an inspiring environment with a dedicated team of scientists, engineers at the forefront of quantum technology.

Interested?

If you have any questions on the project, please do not hesitate to contact us.

If you are interested in applying for the project, please send a motivation letter and resume to Adriaan Rol (recruitment@orangeqs.com).

Reference:

Jonas Helsen, Ingo Roth, Emilio Onorati, Albert H. Werner, Jens Eisert, "A general framework for randomized benchmarking", https://arxiv.org/abs/2010.07974, Oct 2020.