ADIA Lab and Rigetti Sign Collaboration Agreement to Develop Quantum Machine Learning Solution for Probability Distribution Classification

Abu Dhabi, 26 July 2023

ADIA Lab, an independent Abu-Dhabi-based institute dedicated to basic and applied research in data and computational sciences, has signed a collaboration agreement with Rigetti Computing, Inc. ("Rigetti"), a pioneer in full-stack quantum-classical computing.

Together, ADIA Lab and Rigetti will collaborate to design, build, execute, and optimize a quantum computing solution intended to address the probability distribution classification problem, one of the greatest challenges of quantitative finance, with many direct applications to practical use cases in the investment industry.

The collaboration aims to make use of today's quantum computing devices for solving real-world problems, with the ambitious objective of reducing the gap to the target of narrow quantum advantage. This is the point at which a quantum computer is able to solve a practical, operationally relevant problem significantly better, faster, or cheaper than a current classical solution.

Dr. Horst Simon, Director of ADIA Lab, said: "The impact of quantum computing on quantitative finance has become a central research problem that will define the future of the industry. Partnering with Rigetti allows us to advance our research in this important area with access to leading quantum computing technology and experts. We look forward to embarking on this collaborative research project and discovering more powerful ways to address a key challenge in the quantitative finance sector."

Dr. Subodh Kulkarni, CEO of Rigetti, said: "We believe that in order to reach narrow quantum advantage, we need to work on real-world, well-defined and hard computational problems. Working with ADIA Lab's researchers, we will be able to leverage their expertise, datasets, and use cases towards building a quantum solution that we hope will outperform current classical solutions.

"We believe the finance sector is in a strong position to benefit from quantum computing due to the many complex use cases that span financial organizations, and the potential shorter path to adoption. Quantum algorithms applied to existing financial models could be integrated into production-type environments in weeks, while rolling out a new material or drug discovered using a quantum computer could take years."

ADIA Lab will define finance-related use cases and provide Rigetti with classical datasets, with a focus on time series. Rigetti will investigate methods of encoding the classical datasets into corresponding quantum states using parameterised quantum circuits. Fidelity metrics will be developed with the aim to compare two quantum states and determine their similarity. Results will be benchmarked against classical algorithms used to compare distributions. Rigetti will build and test the quantum solutions using its Quantum Cloud Services (QCS™) platform.

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ABOUT ADIA LAB

ADIA Lab is an independent institution engaged in basic and applied research in Data Science, Artificial Intelligence, Machine Learning, and High-Performance and Quantum Computing, across all major fields of study.

This includes exploring applications in areas such as climate change and energy transition, blockchain technology, financial inclusion and investing, decision making, automation, cybersecurity, health sciences, education, telecommunications, and space.

Based in Abu Dhabi, ADIA Lab is an independent, standalone entity supported by the Abu Dhabi Investment Authority (ADIA), a globally-diversified investment institution that invests funds on behalf of the Government of Abu Dhabi.

ADIA Lab has its own governance and operational structure, and is guided by an Advisory Board of global thought leaders in data and computationally-intensive disciplines, to pursue its research independently.

For more information, please visit www.adialab.ae or contact us at info@adialab.ae

ABOUT RIGETTI

Rigetti is a pioneer in full-stack quantum computing. The Company has operated quantum computers over the cloud since 2017 and serves global enterprise, government, and research clients through its Rigetti Quantum Cloud Services platform. The Company's proprietary quantum-classical infrastructure provides high performance integration with public and private clouds for practical quantum computing. Rigetti has developed the industry's first multi-chip quantum processor for scalable quantum computing systems. The Company designs and manufactures its chips in-house at Fab-1, the industry's first dedicated and integrated quantum device manufacturing facility.

Learn more at www.rigetti.com