Rigetti Computing Awarded Innovate UK Grant to Develop Quantum Machine Learning Techniques for Financial Data Streams

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Rigetti will be joined by Amazon Web Services (AWS), Imperial College London, and Standard Chartered to develop quantum machine learning techniques designed to enable financial institutions to more effectively process, interpret, and make decisions with complex data streams.

LONDON, Jan. 11, 2024 (GLOBE NEWSWIRE) -- Rigetti UK Limited, a wholly owned subsidiary of Rigetti Computing, Inc. (Nasdaq: RGTI) ("Rigetti" or the "Company"), a pioneer in full-stack quantum-classical computing, today announced that it was awarded an Innovate UK grant as part of the Feasibility Studies in Quantum Computing Applications competition. The consortium aims to use quantum computing to improve current classical machine learning techniques used by financial institutions to analyze complex data streams. Joining Rigetti in this work is Amazon Web Services (AWS), Imperial College London, and Standard Chartered.

Financial institutions need to continuously interpret complex data streams to extract information necessary for providing accurate credit risk evaluation, managing market-making services, and predicting emissions in the context of green finance, among other things. Classical machine learning techniques used to assist and provide insights to these services have limitations as these data streams are, in general, complex. Combining quantum computing with classical machine learning methodology could offer more powerful resources for processing these data streams, given the potential for quantum computers to process some types of information more efficiently than with classical resources alone.

By leveraging Rigetti's quantum computer and software, Standard Chartered's datasets and classical benchmarks, Imperial College London's expertise on classical machine learning models for data streams, and AWS classical high performance computing resources, the consortium will aim to address the following research objectives: (1) further develop quantum signature kernels and quantum-enhanced feature maps, (2) benchmark the results against classical machine learning methods for streamed data, and (3) build and study quantum algorithms for computing signatures and signature kernels for long and high-dimensional data streams efficiently.

The signature, a centerpiece of rough path theory, provides a top-down description of a stream that filters out local superfluous and noisy information of a stream while retaining essential information. Its algebraic and analytic properties make it a natural universal feature map for streamed data. Significant efforts have been made by members of the Imperial team to scale signature methods to high dimensional streams. One elegant solution is provided by signature kernels, which allows one to benefit from the advantages of working with infinitely many signature features without some of the concomitant drawbacks. Adding a quantum element has the potential to improve upon the classical signature kernel methods. These enhanced capabilities could provide a route to demonstrating a commercial application of quantum computing for finance and enable financial institutions to improve their efficiency through cost reduction and enhanced productivity.

"Developing quantum-enhanced machine learning solutions could enable financial institutions to use the full capability of NISQ-era computing, and has the potential to accelerate our work towards narrow quantum advantage, the point at which a quantum computer outperforms the best classical resources," said Rigetti CEO Dr. Subodh Kulkarni. "Collaborating with leading UK financial institutions, AWS, and universities should give us the insight we need to advance the development of quantum applications for the finance sector, and many other industries with complex datasets."

"The future of quantum computing will be built on the combination of quantum with classical compute infrastructure as part of a unified, cloud-based environment. This project is a great example of leveraging classical HPC resources with the aim to accelerate innovation in quantum machine learning algorithms – an important step as we move toward quantum advantage," said Richard Moulds, general manager, Amazon Braket at AWS. "This initiative should not only benefit the finance sector, but could also encourage other industries to benchmark new machine learning models and continue to improve quantum algorithm performance."

"Combining quantum technologies with rough paths techniques has the potential to produce more scalable signal processing algorithms for complex financial data streams. Making the implementation open access is crucial to ensure further development of these tools both in academia and industry," said Dr. Cristopher Salvi, Lecturer in Mathematics and Machine Learning at Imperial College London. "The outcomes of our joint work can help strengthen the UK's efforts in quantum computing research."

"Quantum computing, like previous and current major advancements in technology, is poised to deliver extensive advantages while simultaneously causing significant disruptions to established business processes. This is why it's important for companies to future-proof themselves by adopting this new technology from an early stage. Our collaboration with Rigetti, Imperial College London, and AWS gives us access to high-performance computational resources and quantum algorithm expertise that could strengthen our position as an industry leader in a future quantum-ready economy," said Craig Corte, Global Head of Digital Channels and Client Data Analytics at Standard Chartered.

The project began on January 1, 2024 and will last 18 months.

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.

About Imperial College London
Imperial College London is a global top ten university with a world-class reputation. The College's 22,000 students and 8,000 staff are working to solve the biggest challenges in science, medicine, engineering and business. The Research Excellence Framework (REF) 2021 found that it has a greater

proportion of world-leading research than any other UK university, it was named University of the Year 2022 according to The Times and Sunday Times Good University Guide, University of the Year for Student Experience 2022 by the Good University Guide, and awarded a Queen's Anniversary Prize for its COVID-19 response. The Department of Mathematics at Imperial College London is one of the largest departments of Mathematics in the UK and is a leading international centre for research and teaching, ranking among the very best UK Mathematics Departments. The Department's research strategy aligns synergistically with Imperial's academic strategy and its research ethos, which emphasises working across disciplines, quantitative approaches to research, translating ideas into impact, and collaboration with stakeholders locally, nationally, and internationally. Learn more at https://www.imperial.ac.uk/.

About Standard Chartered
We are a leading international banking group, with a presence in 53 of the world's most dynamic markets and serving clients in a further 64. Our purpose is to drive commerce and business transformation through our unique diversity, and our heritage and values are expressed in our brand promise, here for good.

Standard Chartered PLC is listed on the London and Hong Kong Stock Exchanges.

Cautionary Language Concerning Forward-Looking Statements Certain statements in this communication may be considered "forward-looking statements" within the meaning of the federal securities laws, including but not limited to, expectations with respect to the Company's business and operations, including its expectations related to the Innovate UK grant as part of the Feasibility Studies in Quantum Computing Applications competition and work with AWS, Imperial College London and Standard Chartered to use quantum computing to improve current classical machine learning techniques used by financial institutions to analyze complex data streams. Forward-looking statements generally relate to future events and can be identified by terminology such as "commit," "may," "should," "could," "might," "plan," "possible," "intend," "strive," "expect," "intend," "will," "estimate," "believe," "predict," "potential," "pursue," "aim," "goal," "outlook," "anticipate," "assume," or "continue," or the negatives of these terms or variations of them or similar terminology. Such forward-looking statements are subject to risks, uncertainties, and other factors which could cause actual results to differ materially from those expressed or implied by such forward-looking statements. These forward-looking statements are based upon estimates and assumptions that, while considered reasonable by Rigetti and its management, are inherently uncertain. Factors that may cause actual results to differ materially from current expectations include, but are not limited to: Rigetti's ability to achieve milestones, technological advancements, including with respect to its roadmap, help unlock quantum computing, and develop practical applications; the ability of Rigetti to complete ongoing negotiations with government contractors successfully and in a timely manner; the potential of quantum computing; the ability of Rigetti to obtain government contracts and the availability of government funding; the ability of Rigetti to expand its QCS business; the success of Rigetti's partnerships and collaborations; Rigetti's ability to accelerate its development of multiple generations of quantum processors; the outcome of any legal proceedings that may be instituted against Rigetti or others; the ability to continue to meet stock exchange listing standards; costs related to operating as a public company; changes in applicable laws or regulations; the possibility that Rigetti may be adversely affected by other economic, business, or competitive factors; Rigetti's estimates of expenses and profitability; the evolution of the markets in which Rigetti competes; the ability of Rigetti to execute on its technology roadmap; the ability of Rigetti to implement its strategic initiatives, expansion plans and continue to innovate its existing services; disruptions in banking systems, increased costs, international trade relations, political turmoil, natural catastrophes, warfare (such as the ongoing military conflict between Russia and Ukraine and related sanctions and the state of war between Israel and Hamas and related threat of a larger regional conflict), and terrorist attacks; and other risks and uncertainties set forth in the section entitled "Risk Factors" and "Cautionary Note Regarding Forward-Looking Statements" in the Company's Annual Report on Form 10-K for the year ended December 31, 2022 and Quarterly Reports on Form 10-Q for the quarters ended March 31, 2023, June 30, 2023 and September 30, 2023, and other documents filed by the Company from time to time with the SEC. These filings identify and address other important risks and uncertainties that could cause actual events and results to differ materially from those contained in the forward-looking statements. Forward-looking statements speak only as of the date they are made. Readers are cautioned not to put undue reliance on forward-looking statements, and the Company assumes no obligation and does not intend to update or revise these forward-looking statements other than as required by applicable law. The Company does not give any assurance that it will achieve its expectations.

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