CaixaBank becomes the first Spanish bank to develop risk classification model using quantum computing

- ***The company is advancing its quantum computing strategy and has developed a machine learning algorithm to classify customers according to their credit risk.***

- ***With this project, CaixaBank has become the first institution in Spain and one of the first in the world to incorporate quantum computing into its services.***

Barcelona, 16 April 2020

CaixaBank is progressing in its preparation strategy for the arrival of quantum computing. After successfully performing the first real tests of quantum computing to study the applications of this technology in financial services, the institution has taken a step further and developed the first machine learning algorithm to classify risks in Spanish banking leveraging quantum computing.

The institution, chaired by Jordi Gual and with CEO Gonzalo Gortázar, therefore becomes the first Spanish institution to apply a hybrid computing framework — which combines quantum computing and conventional computing in different phases of the calculation process — to classify credit risk profiles. To do this, CaixaBank used a public data set corresponding to 1,000 artificial users, with a similar profile to existing customers, but with information configured specifically for the test.

With this project, the institution is making improvements in risk scenario simulations and machine learning, underpinning increasingly complex algorithms which require large quantities of data to learn, whilst also progressing its analysis of quantum computing applications. The results of this test, which demonstrates that hybrid computing can achieve results comparable to those offered by the conventional solution in less time, will be published in more detail in specialist channels so that the conclusions are available to the community.

Quantum computers are based on the properties of superconductors, which integrate their process units, known as qubits, instead of the classical [binary] bits. Due to these properties, they have the capacity to process a multitude of variables and scenarios simultaneously, achieving a computing capacity that grows exponentially with the number of qubits.

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Hybrid computing uses this exponential computing advantage to perform complex calculations of parameters optimising machine learning algorithms and combines them with classical computing methods to make the most out of both systems. With the application of hybrid algorithms (quantum and classical) in risk analysis, the institution can reach the same conclusions as the classical method in much less time.

First bank in Spain to work with quantum computing

Prior to this solution, CaixaBank developed a project to carry out risk assessment simulations for financial assets using quantum computing. In this field, the bank implemented a quantum algorithm capable of assessing the financial risk of two portfolios created specifically for the project based on real data, one consisting of mortgages and the other, treasury bills, becoming the first institution in Spain and one of the first in the world to incorporate quantum computing into its innovations.

This financial year has allowed the bank to enhance its skills in deploying quantum versions of classical algorithms and validate the emergence of the quantum solution. For CaixaBank, it is essential to invest in exploring the potential of quantum computing for various areas of the financial sector, although the first commercial applications may take a while. CaixaBank will continue to explore use cases and the disruption potential of quantum computing in the financial world.

CaixaBank, leader in innovation

CaixaBank continuously invests in new technology in order to satisfy evolving customer requirements and emerging business needs and to provide access to information around the clock. As a result, it regularly reviews and adapts its infrastructure to the needs of its customers, while guaranteeing total security.

This involves a continued commitment to emerging and pioneering technologies, from blockchain to robotics, including artificial intelligence and quantum computing.

As a result of its continued commitment to digital transformation, which is consistent throughout CaixaBank's trajectory, the bank has built the largest base of digital customers in Spain (6.5 million). In addition, CaixaBank has developed ground-breaking technology projects in the sector, such as the first ATMs that allow users to withdraw cash through facial recognition and without having to enter their PIN – a project recognised as one of the Technology Projects of the Year in the Tech Project Awards by *The Banker* magazine.

Thanks to its digital transformation strategy, CaixaBank has become one of the highest-rated banks in the world based on the quality of its digital products and services. In 2019, the company received the Best Bank Transformation in Western Europe award by *Euromoney* and the Most Innovative Bank in Western Europe award by *Global Finance*. Furthermore, it

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was recognised as the best Private Banking institution in the world due to its digital client communication capabilities in the Wealth Tech Awards by PWM, of the *Financial Times* group.

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