**OCBC ties up with varsities in quantum leap to boost fraud detection, data security**
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# OCBC ties up with varsities in quantum leap to boost fraud detection, data security

## Research will also tap quantum tech to speed up financial derivative pricing

**Sarah Koh**

OCBC Bank is working with three local universities to tap the enhanced computational power of quantum computers to strengthen real-time fraud detection and better secure data against new threats.

They are the National University of Singapore (NUS), Nanyang Technological University (NTU) and Singapore Management University (SMU).

Under their 12-month research collaborations inked on July 17, OCBC will also be harnessing quantum algorithms to perform derivative pricing, the process of determining the value of equity derivative products such as options, futures and swaps.

The collaborations are a step in the right direction as quantum is no longer just an exciting possibility, said the Ministry of Digital Development and Information's chief quantum adviser David Koh.

He said that the technology will be able to solve problems that are considered impossible with traditional classical computing systems.

"For OCBC, potentially, it can optimise financial instruments," said Mr Koh, who is also chief executive of the Cyber Security Agency of Singapore.

For others, it can solve complex logistics problems, accelerate drug discovery, discover new material and enhance security against increasing cyber threats, he added.

"If we can do this well, we will have a quantum ecosystem that offers our businesses a global competitive edge in a next-generation digital hub."

A total of $700 million has been committed to the research and development of quantum technology by the Singapore authorities since 2002.

The Ministry of Digital Development and Information's chief quantum adviser David Koh (centre) at the signing of the collaborations with (from far left) NTU's Professor Wang Huaxiong; OCBC's head of group operations and technology Praveen Raina; NUS' Centre for Quantum Technologies deputy director Valerio Scarani; and Associate Professor Zhu Feida, SMU's associate dean of partnerships and engagement, School of Computing and Information Systems. PHOTO: OCBC

In 2024, OCBC started training employees in quantum computing, including proficiencies in quantum applications, programming and security measures.

Some of the 50 OCBC employees who have been trained so far will be involved in the research collaborations.

The research will involve working with NUS' Centre of Quantum Technologies (CQT) to speed up Monte Carlo simulations, a technique widely used in financial derivative pricing.

Derivatives are contracts between two parties, with the value depending on various market scenarios, said NUS' assistant professor Patrick Rebentrost. To get a fair value, banks would have to get an average from simulating many market conditions.

"To simplify, a classical computer would need to simulate a million different scenarios while a quantum computer would only need to simulate a thousand scenarios to get the same result," said Prof Rebentrost, a principal investigator at CQT.

To speed up accurate fraud detection, OCBC will work with SMU to apply quantum machine-learning techniques to analyse complex and unstructured data to pick up patterns and anomalies that are indicative of fraudulent activity.

As quantum technology evolves, it also risks leaving current encryption technology outdated. Thus, OCBC will also work with NTU to strengthen cryptography techniques.

"At NTU, we are using our expertise in post-quantum cryptography to develop solutions that can withstand next-generation cyber attacks," said Professor Wang Huaxiong, director of NTU's Strategic Centre for Research in Privacy-Preserving Technologies and Systems.

Findings from these collaborations will be published in research papers and journals, which aim to help any organisation seeking to adopt quantum technology, said Mr Peter Koh, OCBC's head of group technology architecture. "With this knowledge, hopefully they can catch up."

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SPEEDING UP

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**NUS' ASSISTANT PROFESSOR PATRICK REBENTROST**

WARDING OFF CYBER ATTACKS

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**PROFESSOR WANG HUAXIONG**, director of NTU's Strategic Centre for Research in Privacy-Preserving Technologies and Systems.