

HSBC x IBM - Quantum Algo Trading

Speakers:

Philip Intallura, Group Head of Quantum Technologies, HSBC

Dr. Jay Gambetta, Vice President, IBM Quantum

Dr. Manuel Proissl, IBM Quantum Industry Applications Lead

Josh Freeland, Global Head of Algo Credit Trading, HSBC

[Philip Intallura] We believe that quantum technology is going to have a very significant impact on the financial services industry.

It's a very exciting time within this field because we're at this point of discovery, we're trying to forge a path that there is no blueprint for.

[Text on screen] Quantum Algo Trading
A World-First

[Dr. Jay Gambetta] The partnership with HSBC has been about how can we use quantum computing to look at problems in the financial space.

[Dr. Manuel Proissl] Quantum computers are starting to become useful tools to explore modelling of financial markets, and in particular, in the quantitative investment space.

[Philip Intallura] Algorithmic trading refers to using computer programs to automatically execute trades, usually with predefined rules, market data and certain strategies.

And this is done with almost no human interaction.

[Josh Freeland] We're able to work on a problem that we actually have in real-world trading.

So this is something that we do thousands of times a day already and that's estimating the likelihood of winning a trade.

[Dr. Manuel Proissl] The business problem concerns the optimisation of trade orders of corporate bonds and how likely they would be executed.

And the estimation of that likelihood is unfortunately exposed to significant errors.

[Philip Intallura] What we've demonstrated here is the ability to do something with a quantum computer in a hybrid workflow that we just cannot replicate using classical computing alone.

What we've effectively shown here is up to 34 per cent improvement in predicting whether an order will be fulfilled.

We aren't able to compare to that number using classical-only methods.

And what that ultimately means is increased margins and greater liquidity.

This is the single most important achievement of the HSBC quantum programme to date.

[Text on screen] Thomas J. Watson IBM Research Center, Yorktown Heights, NY

[Dr. Jay Gambetta] Working with HSBC, I think is one of the best examples of us putting science and practice together.

Algorithm trading actually uses a lot of advanced computation to do the problem.

And what they're doing is a big optimisation problem, and what the team has done is injected into this optimisation a quantum algorithm that looks for patterns.

And since we know that quantum is better at finding certain types of patterns or structure, this is a good candidate of exploring quantum computing for industry applications.

[Dr. Manuel Proissl] We got together a global and interdisciplinary team of experts from HSBC and IBM that really brought together a unique set of skills from quantitative finance, trading, data science and AI to quantum algorithms and hardware.

The exciting part about this collaboration, and in particular this project, was to directly work with the algorithmic traders that work with these models every day and know their limitations.

They really understand the problem at the heart and this inspired also the way how we would approach going in from a quantum perspective.

[Josh Freeland] At one point there were 16 physicists and AI machine learning researchers working around the clock trying to achieve the same thing that the quantum computer did.

[Dr. Jay Gambetta] This achievement is important because it's the first example of using quantum on real industry data.

As our systems get bigger, faster and more performant, and as we start to discover more algorithms, we are only going to see more and more of these examples.

[Philip Intallura] This is the beginning, but it is also our most tangible demonstration of just how close we are from extracting value, from quantum computing.

[Text on screen] HSBC | Opening up a world of opportunity