Quantum Computing Use Cases

Financial Transaction Close Forecast

HSBC



New Energy and Industrial Technology Development Organization (NEDO)

HSBC: Financial Transaction Close Forecast [2025/11]

Validation

Industry	Finance
Process	securities
Method	Simulation
Category	Gate*

Background

- An important element of algorithmic bond trading is the accurate prediction of which orders will lead to contracts, but it is limited by the complex dynamics of financial markets with inherent uncertainty and by models that aim to learn from multivariate financial time series that exhibit stochastic properties, often with hidden temporal patterns
- HSBC and IBM experiment with a quantum-classical hybrid method on IBM Quantum Heron processors using utility-scale intraday event data

Issues and motivation to be solved

- Higher accuracy of contract probability estimation in algorithmic bond trading using hybrid method is desired.

Problem setting as a quantum computer

- Combining quantum and classical computing resources to analyze HSBC's utility-scale bond trading data
- Predicting which transactions will be closed using a quantum-classical hybrid method
  - ➢ Up to 34% improvement over the classical computer only approach

Expected business benefits

- demonstrate the potential of current and near-future quantum computers to give financial services companies a significant competitive advantage in this valuable use case
- It's an example of how IBM's partners can combine their deep expertise with the latest innovations in quantum algorithm development to demonstrate the utility of quantum computers in practical applications.

See Also: HSBC: "HSBC breaks new ground with IBM quantum computer algorithm deal" (https://www.ibm.com/jp-ja/think/insights/hsbc-quantum-algorithmic-bond-trading)
*Gate（gate-based）: A computing approach in which operations are applied sequentially to qubits to perform calculations. Similar in concept to logic circuits in classical computers, it can address a wide range of problems.

More use cases are available on our website. We invite you to explore them.
https://www.quantum-computing-use-cases.nedo.go.jp/english/

More Use Cases

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This collection of use cases was obtained as a result of the work commissioned by the New Energy and Industrial Technology Development Organization (NEDO) "Cyber-Physical Development Business of Quantum/Classical Hybrid Technology/Study of Use Case of Quantum Technology" and the "Post-5G Information and Communications System Infrastructure Reinforcement R & D Project (Quantum Industrialization)/Comprehensive Study for Promoting the Industrialization of Quantum Computers".