Dear FINRA Team,

Contributors: Samuel Palmer, Raj Patel, Aser Cortines

We are writing on behalf of Multiverse Computing, a leader in quantum computing solutions for the financial sector. With a strong foundation in developing quantum and quantum-inspired algorithms to solve complex financial problems, we are at the forefront of translating quantum technology into tangible benefits for the finance industry. Our unique expertise positions us to offer valuable insights into the evolving role of quantum computing in finance.

Following your request for comments on the publication "Quantum Computing and the Implications for the Securities Industry", we have reviewed your report and would like to commend you on the thorough analysis and valuable perspectives provided. However, we've identified a few areas where the report could benefit from additional insights to enhance its comprehensiveness and precision.

Suggested Citation Addition:

> We propose adding the article titled "Quantum circuit design for solving linear systems of equations" (https://arxiv.org/abs/1807.03890 [arxiv.org]) as citation [36] on page 4. This publication offers insights into the capabilities of quantum algorithms within finance and how they could significantly impact the sector.

Expanding on Quantum Annealing:

> The report predominantly focuses on gate-based quantum computing, with limited reference to quantum annealing technologies. Given quantum annealers' aptitude for solving optimization problems pertinent to the finance sector, such as portfolio optimization and risk evaluation, incorporating a detailed discussion on this technology in either Section I or II would render a more holistic view of the quantum computing spectrum.

Clarifying Grover's Algorithm's Application:

> Mentioned on page 8 as a cybersecurity tool, it is vital to highlight that Grover's Algorithm primarily facilitates searching within unsorted databases. Its application in cybersecurity, though plausible, deviates from its foundational intent. Clarifying this aspect could prevent potential misconceptions about the algorithm's primary utility.

Providing Concrete Examples in the Security Industry:

We offer to share in-depth examples and our expertise on applying quantum computing, especially quantum annealers, in the security industry. This includes:

- Index Tracking ([arXiv:2208.11380 [arxiv.org]](#)): Illustrating quantum computing's role in tackling the complex optimization challenges present in index tracking, which paves the way for innovative investment strategies.
- Portfolio Optimization ([arXiv:2106.06735 [arxiv.org]](#); [arXiv:2012.01091 [arxiv.org]](#)): Beyond the mentioned benefits, further case studies from our work may help to understand the significant advantages that quantum computing can bring to this area.
- Trading Signals: Highlighting the application of quantum machine learning in generating trading signals opens new avenues for predictive analytics in finance, leveraging the unparalleled processing power of quantum algorithms.

We believe these additions and clarifications will significantly enrich the report, offering a more rounded understanding of quantum computing's potential impact on the financial sector.

Thank you for considering our suggestions. Multiverse Computing is keen on contributing further to this crucial dialogue and remains at your disposal for any follow-up discussions or clarifications needed.

Best regards,

Samuel Mugel, PhD
CTO
Multiverse Computing

Featured news:

- [NEW] [Making Large Language Models Work On The Edge [forbes.com]](#)
- [Quantum Computing and the Business Transformation Journey [cmr.berkeley.edu]](#)
- [Unlocking Europe's Quantum Potential: Why The Startup Funding Model Is Critical [forbes.com]](#)

A: Centre for Social Innovation, 192 Spadina Ave, Suite 509, Toronto M5T 2C2, Canada
M: +1 (647) 913-0185
W: [http://www.multiversecomputing.com [multiversecomputing.com]](#)