

Multiverse Computing and Bundesdruckerei GmbH Use Quantum Techniques for Enhanced Data Privacy and Fraud Detection

Quantum-inspired solutions demonstrated 15% higher accuracy than current solutions and will be used to improve protections for personal information in datasets

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/EINPresswire.com/ -- [Multiverse Computing](#), a global leader in value-based AI and quantum computing solutions, and the [Bundesdruckerei GmbH](#), the German federal government's

technology company, are exploring the potential of quantum and quantum-inspired solutions. The two companies recently completed two research projects that combined quantum-inspired software and data security expertise to build new prototypes that generate synthetic data more accurately than classic standard algorithms for machine learning. Together they investigated use



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Multiverse Computing*

cases such as improving privacy and utility of synthetic data generations as well as detecting fraudulent transactions in blockchain networks.

Quantum-inspired machine learning (QIML) provides an efficient and scalable approach by leveraging quantum theoretical principles such as tensor networks to manage large data sets and perform machine learning tasks more efficiently than classical techniques. One big advantage of these methods is their ability to compress and process data efficiently and accurately without losing critical information.

In the first project, the potential of a quantum-inspired algorithm for synthetic data generation was explored, with an emphasis on increasing privacy protections for sensitive data within large datasets. Synthetic data is crucial for providing accessible, scalable datasets while protecting privacy, reducing bias, and lowering costs. It enables model training when real data is limited or sensitive, making it a valuable tool in AI and simulation.

The teams started with a publicly available dataset and developed a synthetic data generation

application based on a quantum-inspired AI model that incorporated differential privacy as an additional privacy layer to make the model resilient to adversarial attacks. The layer of protection added by differential privacy ensures that individual entries in a dataset cannot be reverse engineered by external or internal adversaries.

Data generated from this novel quantum-inspired software was compared to the results from a Generative Adversarial Network, a standard classical machine learning algorithm used to generate synthetic data. The quantum-inspired data generation model showed a 15% higher accuracy than the classical solution in generating synthetic data that closely matched the original data.

“There’s no doubt that we will continue to see new ways that quantum solutions can make AI stronger and more efficient in the service of protecting people and data,” said Enrique Lizaso Olmos, CEO of Multiverse Computing. “Our work with the team at Bundesdruckerei combined our expertise to raise the level of data privacy and cyber security by leveraging quantum-inspired algorithms with AI solutions.”

The other project focused on developing an AI solution to detect fraudulent transactions within a blockchain network using a quantum-inspired graph neural network and a quantum boosting machine learning algorithm. The results showed that the quantum-inspired approach achieved the same performance as the classical version while reducing AI Model-parameters significantly. This improved training time by 11% and inference time by 27%.

“The research cooperation with Multiverse Computing is a great addition to our research activities in the field of quantum technologies. It is very important for us to work together with the leading quantum industry players to explore new AI solutions in the quantum age, in particular in the context of data privacy and cyber security,” said Dr. Kim Nguyen, Head of Innovations of Bundesdruckerei GmbH.

About The Bundesdruckerei Group

Bundesdruckerei GmbH and its subsidiary Maurer Electronics GmbH are driving technological developments in the areas of identity and authorisation management, administrative digitisation, data analysis and artificial intelligence as well as government payment methods and value transfer systems. In this way, it forms the basis for a modern and resilient society.

As a company of the Bundesdruckerei Group and with more than 250 years of experience, the company is paving the way to a secure digital future. Bundesdruckerei GmbH currently employs around 3,090 people and generated sales of 907.4 million euros in 2023. For more information, go to www.bundesdruckerei-gmbh.de

About Multiverse Computing

Multiverse Computing is a leading quantum AI software company dedicated to applying quantum and quantum-inspired AI solutions to address complex challenges in finance, energy,

manufacturing, logistics, space, life sciences, healthcare and defence, delivering tangible value today. The company of 160 full-time employees has been recognized as one of the 100 Most Promising Companies in AI by CB Insights and won the 2024 Future Unicorn award from DigitalEurope.

Leveraging expertise in quantum and quantum-inspired AI algorithms, the company maximizes results from both current quantum devices and classical high-performance computers. Its flagship product, CompactifAI, a LLM compressor which uses quantum-inspired tensor networks to make large language models or any convolutional neural network more efficient and portable. The company has also developed Singularity, it allows professionals across all industries to leverage quantum computing to speed up and improve the accuracy of optimization and AI models without being an expert in quantum. Multiverse Computing has offices in Spain, Canada, France, Germany, UK, Italy and USA. For more information, please contact us at sales@multiversecomputing.com

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