
Cambridge Quantum

PRESS RELEASE

Cambridge, United Kingdom
Thursday, November 11 2021

CAMBRIDGE QUANTUM AND DEUTSCHE BAHN NETZ AG leverage latest quantum algorithms to optimise train scheduling



Innovations from this collaboration will lead to a meaningful contribution towards a cleaner and greener future

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Cambridge Quantum ([CQ](#)) and Deutsche Bahn Netz AG (DB) announce today a partnership to explore how quantum computers can improve the rescheduling of rail traffic as part of DB's long-term transformative plan, [Digitale Schiene Deutschland](#), to digitise DB's infrastructure and railway system using next-generation technologies to achieve a higher capacity and optimal utilisation of the rail network.

Combining Cambridge Quantum's latest combinatorial optimisation algorithm [Filtering Variational Quantum Eigensolver \(F-VQE\)](#) – recently shown to [outperform leading quantum algorithms](#) – with DB's operations research expertise, the team re-optimised realistic train timetables after simulated delays and are now identifying areas for continued study. This collaboration evidences how innovations in both quantum algorithms and domain-specific modelling can inform a long-term vision for a faster and greener transportation network.

Ilyas Khan, CEO of Cambridge Quantum, said, “We are very excited to be working with Deutsche Bahn to explore and demonstrate the utility of today's Noisy Intermediate Scale Quantum (“NISQ”) processors to solve real-world problems in the transport and logistics sector. Deutsche Bahn's research and development efforts in this area are of critical importance, and we are confident that over time as quantum computers start to scale, our work with the will lead to a meaningful contribution towards a cleaner and greener future.”



These are the first steps in defining a future quantum-advantaged train timetabling system

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Michael Küpper, lead of Capacity and Traffic Management System at Digitale Schiene Deutschland, said, “The collaboration with Cambridge Quantum is a perfect example of how Deutsche Bahn is working as a partner with industry providers and combining our relative expertise towards a goal neither side can achieve alone. By working with Cambridge Quantum, we have fine-tuned our research and development plans and taken the first steps in defining a future quantum-advantaged train timetabling system. We are excited to continue working with Cambridge Quantum to address some of the key challenges and contribute to the rapidly evolving field of NISQ quantum algorithm research.”



ABOUT DEUTSCHE BAHN NETZ AG

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With more than 33,000 km of track, DB Netze Track operates the largest rail network in Europe. More than one billion train-path kilometers are traveled each year on the tracks in Germany. DB Netze Track is responsible for managing infrastructure operations as well as for securing long-term infrastructure quality and availability, and nondiscriminatory access to train-paths and service facilities. This includes preparing schedules in close cooperation with customers, operations management, construction management and maintenance.

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Digitale Schiene Deutschland is a sector initiative of DB AG, the German Federal Ministry of Transport and Digital Infrastructure (BMVI) and further relevant transport associations for the fundamental modernisation and digitalisation of railway infrastructure through the consistent introduction of digital control and safety technology. In addition, Digitale Schiene Deutschland is working on a far-reaching digitalisation of the railway system. For this, a system architecture will detail the tasks of individual components of the railway system, and how they should work together.



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Founded in 2014 and backed by some of the world's leading quantum computing companies, Cambridge Quantum is a global leader in quantum software and quantum algorithms, enabling clients to achieve the most out of rapidly evolving quantum computing hardware. Cambridge Quantum has offices in Europe, USA, and Japan. On 8th June 2021, Cambridge Quantum announced a merger with Honeywell Quantum Solutions which is expected to close in Q4 2021.

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