Quantum: Furthering space exploration with edge devices

Project Leader: Dr Andrew Horsley

Partner Institutions: Trellis Data
System: Nimbus, Magnus
Areas of science: Artificial Intelligence, Quantum Computing

One organisation in the program is Trellis Data, an Australian company democratising machine learning (ML) and artificial intelligence (AI). The company's machine learning platform, the Trellis Intelligence Platform, enables users to accomplish the complex task of designing, training and testing a deep neural network.

The collaboration between Pawsey, Quantum Brilliance and Trellis Data is exploring whether Trellis' post-processing algorithms, which due to their computational complexities must make trade-offs between speed and accuracy when applied at the edge, can be improved by quantum algorithms.

Pawsey's supercomputers can speed up the prototyping of algorithms via simulations and deliver feedback faster to researchers, while also validating QB's room-temperature diamond quantum hardware.

Quantum Brilliance is working to accelerate Trellis' Intelligence Platform's state-of-the-art speech transcription using quantum computers. Pawsey's infrastructure simulates the advanced quantum algorithms that may replace the final post-processing in Trellis' Connectionist Temporal Classification (CTC) decoder, to turn neural network outputs into the transcript that users are looking for. If successful, it will demonstrate the potential power of quantum computing and put once-unthinkable algorithms such as large unordered search within reach within reach of edge computing.

4.2 Trillion

hours of data collected

1

QPU replaces 10,752 GPU cores

50

precent+ reudction in power consumption