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"The detection of gravitational waves is an area of active research, with important upcoming missions that will listen to gravity from space. The future datasets coming from these missions are expected to be large and complex, creating the need for the development of improved data analysis tools, able to extract meaningful information from gravitational wave data. Here, we present our approach towards obtaining a highly performant gravitational wave data analysis tool by combining the robust capabilities of neural network techniques with the cutting-edge potential of quantum computing. In the context of our involvement in the development of the future space missions LISA and AEDGE, we have been developing a quantum neural network based low latency pipeline for the rapid and accurate detection of gravitational wave signatures within simulated detector signals. We successfully trained and tested it to recognize realistic data, embedded within complex noise and modelled to mimic detection by LISA instruments. Our future plans include implementing our pipeline on real quantum hardware with the purpose of performing a benchmarking of two prominent technologies, superconductivity and cold atoms. Our study will not only address the gravitational wave analysis but also assess the feasibility of quantum technologies in large-scale data processing."

Session Classification: Poster Session & Wine & Coffee