Qubit Mapping and Routing tailored to Advanced Quantum ISAs: Not as Costly as You Think

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***Abstract*—We propose CANOPUS (Canonical-Optimized Placement Utility Suite), a qubit mapping/routing framework tailored to advanced quantum ISAs adaptive to versatile hardware architectures.**

I. INTRODUCTION

Advanced ISAs—$\texttt{Can}$ [1], $\sqrt{\texttt{iSWAP}}$ [2]

CANOPUS (**Can**onical-**O**ptimized **P**lacement **U**tility **S**uite) is a qubit mapping and routing framework that is tailored to advanced quantum ISAs, such as $\texttt{Can}$ [1] and $\sqrt{\texttt{iSWAP}}$ [2], which are adaptive to versatile hardware architectures. CANOPUS is designed to optimize the placement of qubits and the routing of quantum gates, taking into account the specific requirements of these advanced ISAs.

REFERENCES

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[2] C. Huang, T. Wang, F. Wu, D. Ding, Q. Ye, L. Kong, F. Zhang, X. Ni, Z. Song, Y. Shi, H.-H. Zhao, C. Deng, and J. Chen, "Quantum instruction set design for performance," *Physical Review Letters*, vol. 130, p. 070601, Feb 2023. [Online]. Available: https://link.aps.org/doi/10.1103/PhysRevLett.130.070601