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Title: Benchmarking NISQ devices using state-of-the-art classical heuristics

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Abstract: In the last few decades, quantum technology has advanced enormously and it is now mature enough to compete against classical computers on optimization problems. More importantly, this leap forward has also become an engine for the development of new classical heuristics. To this end, the Quantum Artificial Intelligence Lab (QuAIL) @ NASA Ames is in the constant pursuit of providing a strong baseline for any potential "quantum enhancement". In my talk, I will present qFlex, our flexible state-of-the-art classical simulator of quantum circuits, and UFO, our Unified Framework for Optimization for combinatorial problems. As part of my talk, I will also present our latest results regarding the classical simulation of the 72-qubit Google Bristlecone, as well as our latest benchmarks on classical and semi-classical devices, such as memcomputing and Ising coherent machines.

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