MIT iQuHack 2026

2B or not 2B: The Pulse of Innovation: Bridging Classical and Quantum Optimization

FLMA8 Submission - Sareen, Sara, Fadia, Ahmad, Leena

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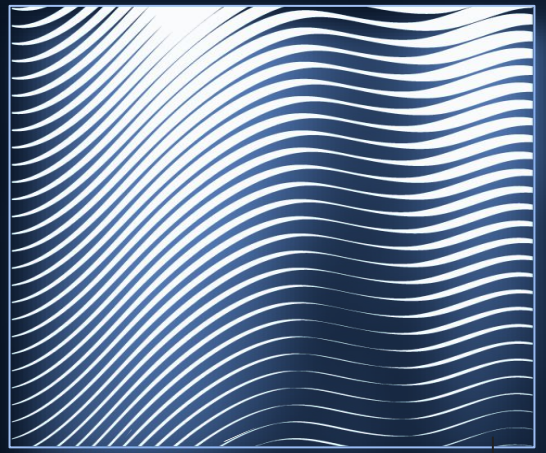


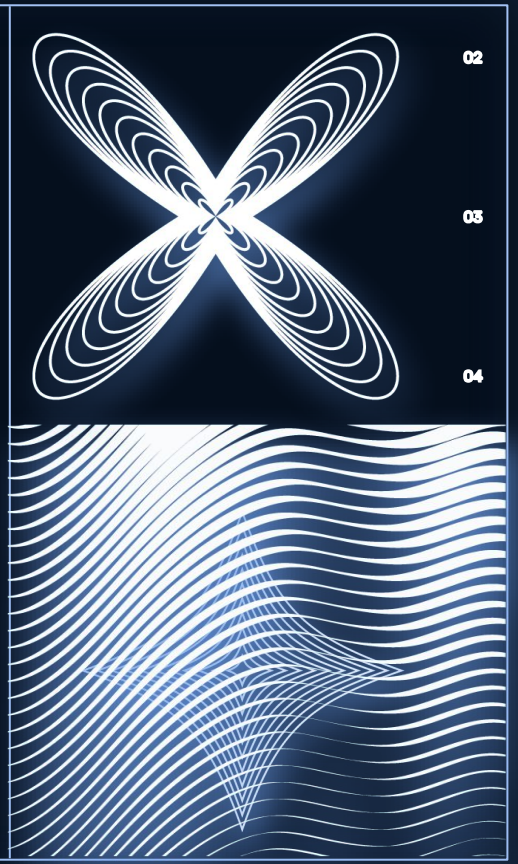
Strategy

- Variational Quantum Eigensolver (VQE)
- Ai Agent Support
- Classical Stage (MTS)

The Process

Hybrid Quantum → Classical Pipeline

It’s the biggest planet in the Solar System



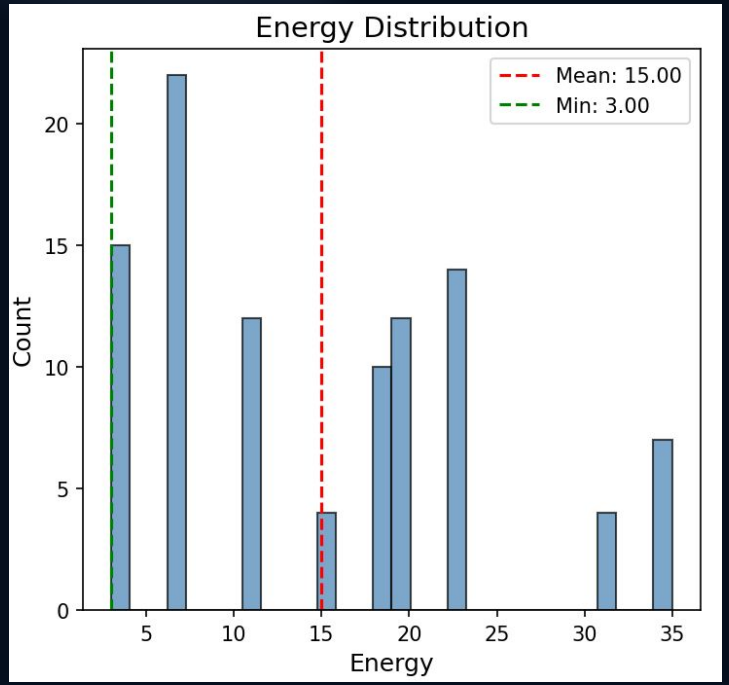
AI Agents

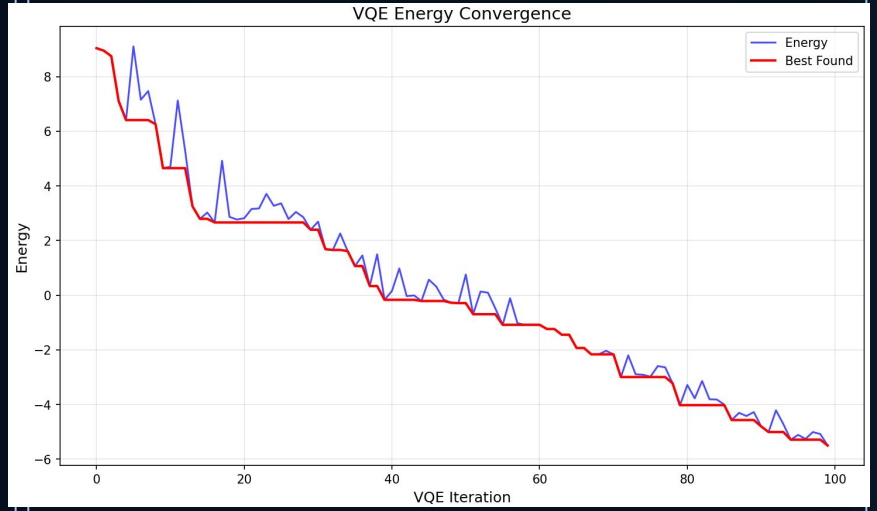
Support in the validation and generation of outputs

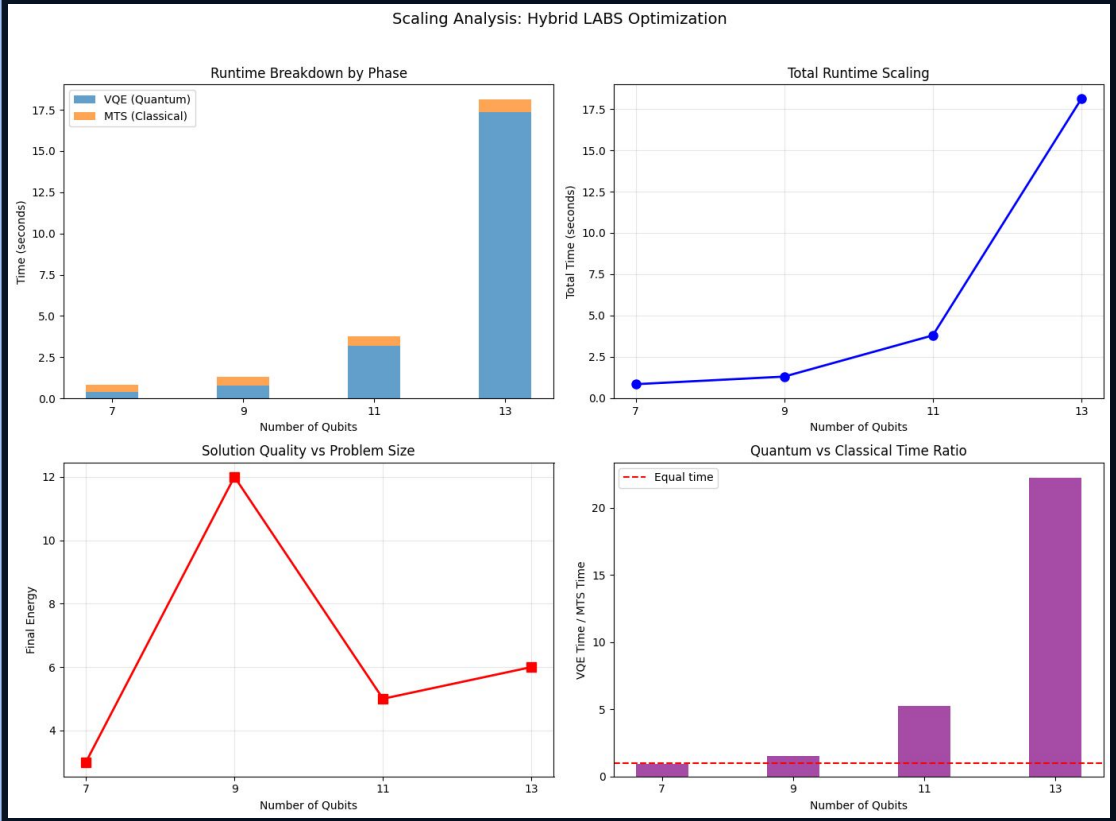
AutoCorrelation

VQE → MTS → C++ Validation

Results


Energy Distribution
Mean: 15.00
Min: 3.00
Count
Energy
0
5
10
15
20
25
30
35


VQE Energy Convergence
Energy
Best Found
Energy
VQE Iteration
8
6
4
2
0
−2
−4
−6
0
20
40
60
80
100

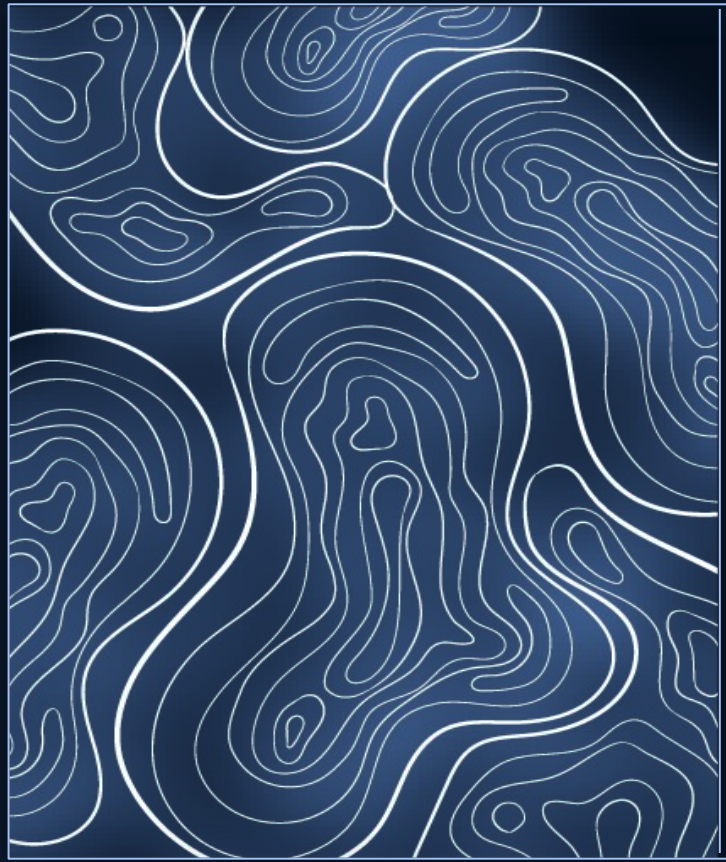

Scaling Analysis: Hybrid LABS Optimization
Runtime Breakdown by Phase
VQE (Quantum)
MTS (Classical)
Time (seconds)
Number of Qubits
Total Runtime Scaling
Total Time (seconds)
Number of Qubits
Solution Quality vs Problem Size
Final Energy
Number of Qubits
Quantum vs Classical Time Ratio
Equal time
VQE Time / MTS Time
Number of Qubits

RETROSPECTIVE

GPU Programing

Application

Time



THANK YOU