Q-OPT
QUANTUM OPTIMIZATION TOOLKIT

# Q-OPT: Quantum Optimization Toolkit

Automated Tools for Quantum Optimization


## Abstract

Well-known quantum optimization algorithms, such as Variational Quantum Algorithms (VQAs), have demonstrated potential across a broad range of applications, including quantum chemistry, machine learning, and combinatorial optimization. To bring these algorithms into practical use, a comprehensive, high-performance and user-friendly toolkit is essential. The **Q-OPT: Quantum Optimization Toolkit** is a collection of software tools designed to support complete end-to-end framework for quantum optimization.


## Workflow

- **Problem Encoding**
  Mapping a classical optimization problem to a Hamiltonian
- **Ansatz Design**
  Mapping a Hamiltonian to an ansatz
- **Circuit Compilation**
  Mapping an ansatz onto the real hardware
- **Classical Optimization**
  Classically optimizing parameters in the ansatz
- **Application**
  Real-world Problems (e.g., LABS)

Tool Overview:

Code link: