

QUANTIC

Quantum computation is becoming a reality. Around the world, several research laboratories and large computer-based companies are developing the first prototypes of quantum computers using diverse physical systems. Among these, superconducting circuits have become one of the most promising due to their favorable scalability which permits building systems with tens of qubits while maintaining the advantageous individual properties.

There are two main lines of research in quantum algorithmia. A first possibility is to use pure quantum logic based on gates that build circuits. The fact that the readout of a quantum machine is non-deterministic brings an element of difficulty to the construction of quantum algorithms and its application to real problems. A second possibility consists in dropping the quantum circuit philosophy in favor of a quantum annealing strategy. This second solution makes it feasible to tackle optimization problems, which are relevant for important, real-life industries such as pharmaceuticals, oil and gas, and chemistry, among many more.

Objectives

- Develop strategies to exploit small and medium size quantum computers
- Adapt realistic problems to quantum annealing
- Develop a quantum operating system to run a small quantum device

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