Dirac 1

1st Generation QUBIT Entropy Quantum Computer

Summary

Dirac-1 is a portable, low power, and room temperature qubit entropy quantum computer (EQC). Dirac-1 solves problems of Objective Function Minimization and Maximization for **binary optimization** by finding the ground state of a complex system with many inter-correlated variables.

These problems correspond to minimizing or maximizing the expected return of the objective function:

$$E = \overbrace{\sum_{i}^{N} C_i V_i}^{\text{Loss}} + \overbrace{\sum_{i,j}^{N} J_{ij} \underbrace{V_i V_j}_{\text{Spin configuration}}}^{\text{Strength of connection}}$$

where Vi is the value of each variable, Ci is the linear coefficient of each variable, which is a real number that can be positive, negative, or zero, Jij is the coupling coefficient of two variables, which can be any real number

Specifications

Type	Qubit (superposition of 0 and 1)
Maximum size of variables	N = 11,000
Connectivity	All-to-all
Operating Temperature	25 ˚C / 77 ˚F (room temperature)
Power Consumption	<80 W
Physical size	Contained in a 3U rack-mountable unit
Order of correlation	Any types of second-order correlations, where interactions between qubits can be repulsive (positive correlation) or attractive (negative correlation)

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