IBM Quantum Creative Challenge

Quantum computers operate on different sets of physical laws than classical computers. One consequence of this is "interference". Like with waves, there can be constructive (additive) or destructive (subtraction) interference. Harnessing this property in a quantum circuit can lead to 'correct' answers interfering constructively and 'wrong' answers destructively, essentially nullifying them.

In this challenge, we'd like you to use the concept of quantum interference to make a creative project showcasing the idea. It can be artistic, technical, or interactive.

The most creative (and correct) use of this idea will be the winner. Preference will be given to projects that:

- use Qiskit and/or IBM Quantum's devices
- explain issues faced, problem your team overcame, and future implications of your project
- show how your project could benefit the quantum computing community
- Present the concept in a new and unique manner

IBM Quantum will award custom swag prizes to the winning teams. Total number of teams receiving a prize will be determined by how many total projects are submitted.

Note - All projects submitted must be using Qiskit version 0.25. Anyone can submit a project, however someone working for a GOE, i.e. Government Owned Entity, will not be eligible for prizes or awards. Full eligibility rules here.

IBM Quantum Technical Challenge

Qiskit Pulse allows you to program real quantum computers at the pulse level. Namely, it provides a language for specifying the microwave control tones (i.e. control of the continuous time dynamics of input signals) that program the quantum state.

In most quantum algorithms/applications, computations are carried out over a 2^n-dimensional Hilbert space spanned by {|0>,|1⟩}^n, where n is the number of qubits. In IBM's quantum hardware, however, there also exists higher energy states which are typically avoided. (e.g. the single qubit "DRAG" pulse helps reduce unintentionally occupation in the |2> state).

In this challenge we want you to use Qiskit Pulse to explore the higher energy states, and put together a unique project which shows how that higher energy state directly benefits or makes your idea possible.

The best application of this idea will be the winner. Preference will be given to projects that:

- use Qiskit and/or IBM Quantum's devices
- explain issues faced, problem your team overcame, and future implications of your project
- show how your project could benefit the quantum computing community
- delve into why this is important for future research or applications

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