WHAT ARE QUANTUM COMPUTERS, AND HOW CAN WE TRAIN THEM IN PYTHON?

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What are quantum computers?

- Programmable computers that harness subatomic particles to store data and perform computation
- Quantum properties such as entanglement and superposition allow computation in a exceptionally large computational spaces
- Near-term quantum computers are specialized devices
- Near-term quantum computers are small and noisy
• Think of near-term quantum devices as black boxes
• They perform matrix-multiplication in exponentially large vector spaces
• We extract *classical* data from the black box via measurement statistics
Parametrized Quantum Functions

- Accepts floating point parameters
- Contains quantum instructions dependent on these parameters
- Returns measurement statistics
Please can we have the gradient
BUILDING A DIFFERENTIABLE QUANTUM PROGRAM
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- unitary.fund
- qosf.org
- pennylane.ai
- quantum.country