bitly.com/ciiti25-bilkis

COMPUTACIÓN CUÁNTICA + IA

RETOS Y OPORTUNIDADES DE UNA CONVERGENCIA DISRUPTIVA

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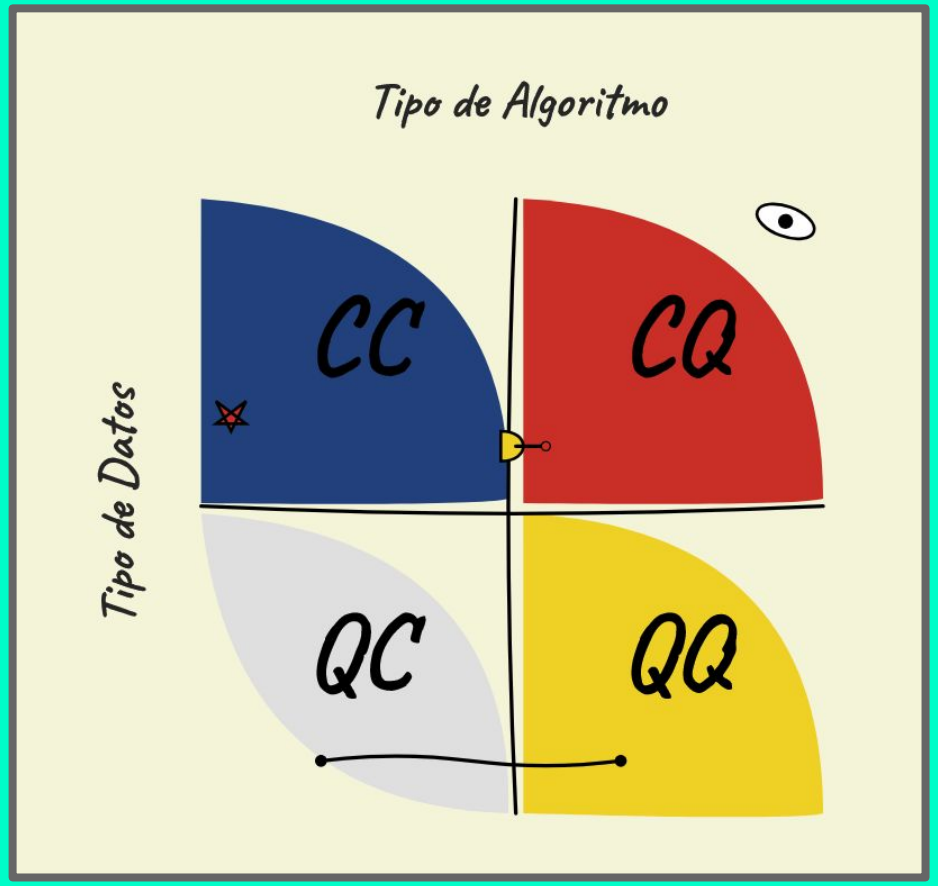
ANTES QUE NADA...

(ESTO ES UNA COMPUTADORA CUÁNTICA)

```python
from qiskit import IBMQ, QuantumCircuit, execute, transpile
from qiskit.tools.monitor import job_monitor

# Load your IBMQ account (you must save your API token locally first with IBMQ.save_account('YOUR_API_TOKEN'))
IBMQ.load_account()

# Get the IBM Quantum provider and select a backend (quantum computer)
provider = IBMQ.get_provider(hub='ibm-q')
backend = provider.get_backend('ibmq_quito')  # Example backend, replace with available backend

# Create a simple quantum circuit with 2 qubits and 2 classical bits
qc = QuantumCircuit(2, 2)
qc.h(0)           # Apply Hadamard gate on qubit 0 to create superposition
qc.cx(0, 1)       # Apply CNOT gate with control qubit 0 and target qubit 1 to create entanglement
qc.measure([0,1], [0,1])  # Measure both qubits

# Transpile (optimize) the circuit for the chosen backend
transpiled_qc = transpile(qc, backend=backend)

# Execute the circuit on the quantum computer with 1024 shots (repetitions)
job = execute(transpiled_qc, backend=backend, shots=1024)

# Monitor the job status on the IBM Quantum cloud
job_monitor(job)

# Get the result counts (measurements)
result = job.result()
counts = result.get_counts(qc)

print("Measurement results:", counts)
```

EXISTE, SE PUEDE USAR, Y HACE COSAS INCREÍBLES

Quantum machine learning



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MI VISIÓN SOBRE EL ASUNTO

CAIGA QUIEN CAIGA

CLASSICAL 4 QUANTUM 4 CLASSICAL

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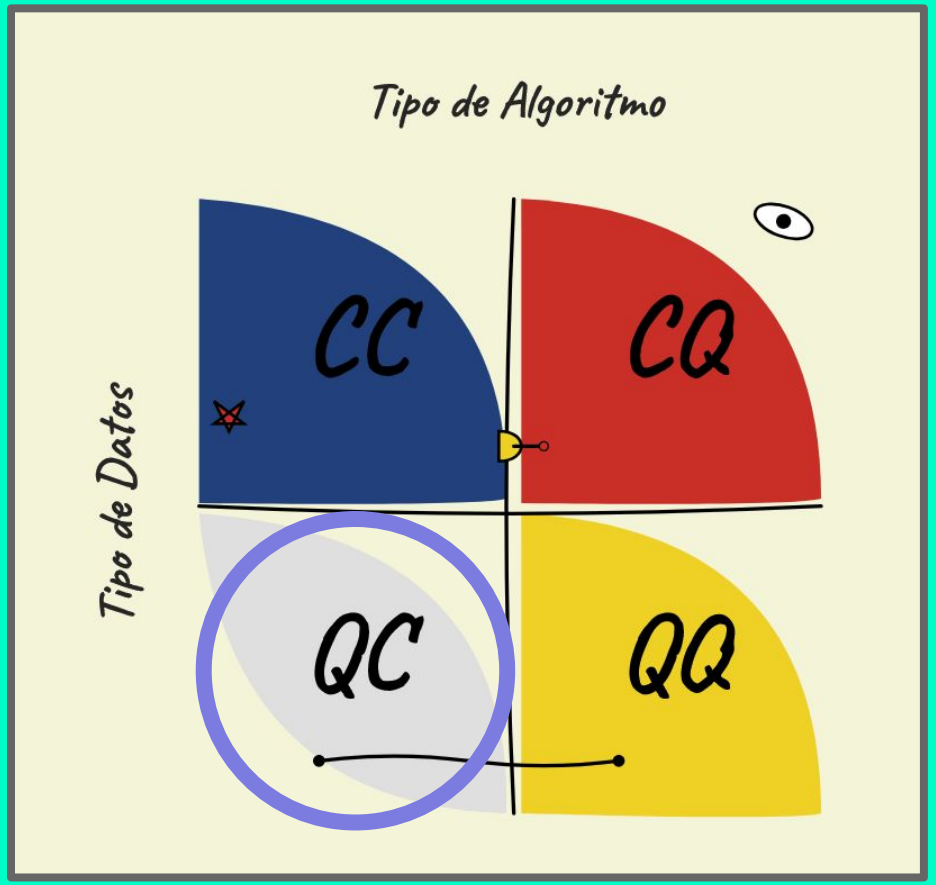
10min: IA sobre problemas cuánticos



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INTELIGENCIA ARTIFICIAL

HABILITA

COMPUTACIÓN CUÁNTICA (HOY)

(TRES CASOS DE USO)

1-¿CÓMO DISEÑO MI CIRCUITO CUÁNTICO?

nature machine intelligence

Article

https://doi.org/10.1038/s42256-025-01001-1

Quantum circuit optimization with AlphaTensor

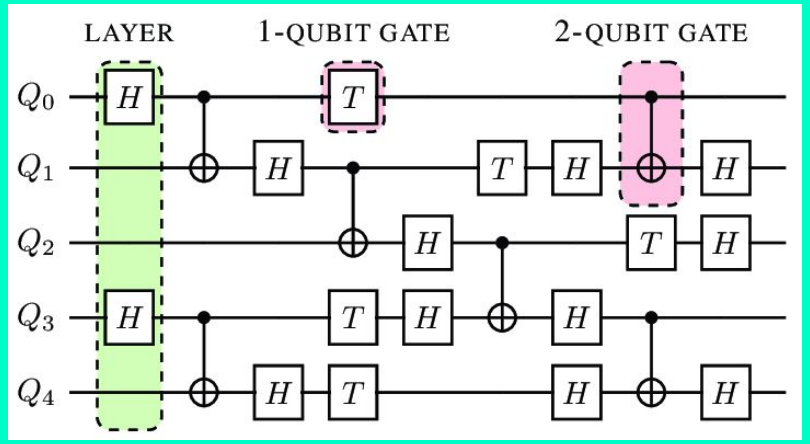
Received: 8 March 2024

Accepted: 20 January 2025

Published online: 20 March 2025

Check for updates

Francisco J. R. Ruiz[1,5], Tuomas Laakkonen[2,5], Johannes Bausch[1], Matej Balog[1], Mohammadamin Barekatain[1], Francisco J. H. Heras[1], Alexander Novikov[1], Nathan Fitzpatrick[3], Bernardino Romera-Paredes[1], John van de Wetering[4], Alhussein Fawzi[1], Konstantinos Meichanetzidis[2] & Pushmeet Kohli[1]



DeepMind

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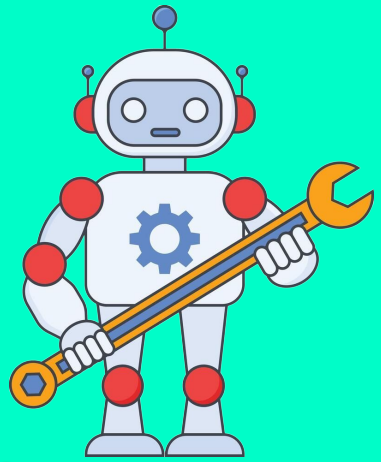
2-CALIBRACIÓN AUTOMÁTICA



QUANTUM MACHINES

10min vs. 2hs

[quantumInsider, QUAlibrate]

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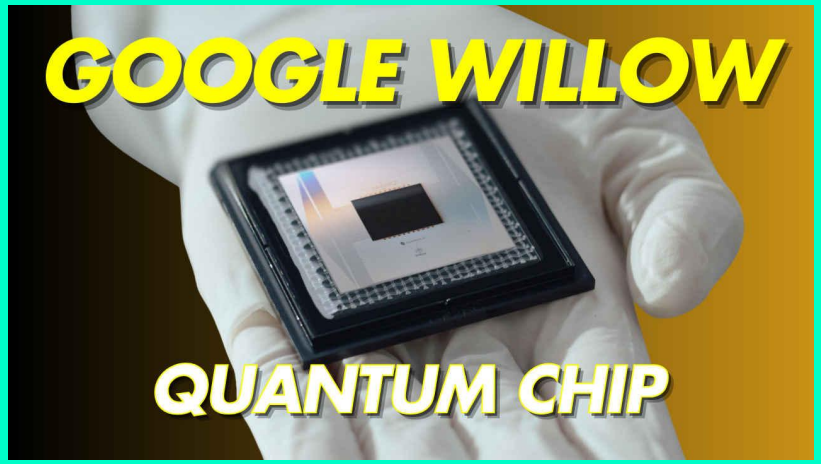
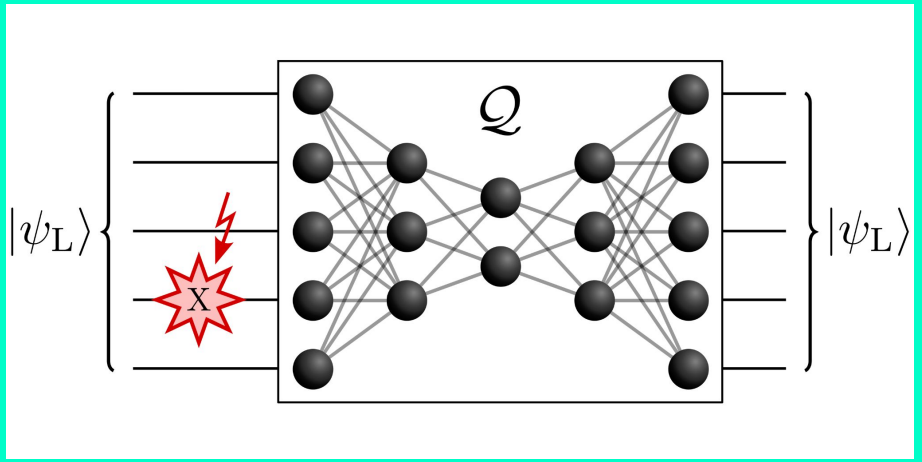
3. Corrección de errores cuántica en tiempo real





[Quantum error correction below the surface code threshold]

Si te interesó esto... te va a gustar:

arXiv > quant-ph > arXiv:2411.09131v1

Search... Help | A

Quantum Physics

[Submitted on 14 Nov 2024]

Artificial Intelligence for Quantum Computing

Yuri Alexeev, Marwa H. Farag, Taylor L. Patti, Mark E. Wolf, Natalia Ares, Alán Aspuru-Guzik, Simon C. Benjamin, Zhenyu Cai, Zohim Chandani, Federico Fedele, Nicholas Harrigan, Jin-Sung Kim, Elica Kyoseva, Justin G. Lietz, Tom Lubowe, Alexander McCaskey, Roger G. Melko, Kouhei Nakaji, Alberto Peruzzo, Sam Stanwyck, Norm M. Tubman, Hanrui Wang, Timothy Costa

Artificial intelligence (AI) advancements over the past few years have had an unprecedented and revolutionary impact across everyday application areas. Its significance also extends to technical challenges within science and engineering, including the nascent field of quantum computing (QC). The counterintuitive nature and high-dimensional mathematics of QC make it a prime candidate for AI's data-driven learning capabilities, and in fact, many of QC's biggest scaling challenges may ultimately rest on developments in AI. However, bringing leading techniques from AI to QC requires drawing on disparate expertise from arguably two of the most advanced and esoteric areas of computer science. Here we aim to encourage this cross-pollination by reviewing how state-of-the-art AI techniques are already advancing challenges across the hardware and software stack needed to develop useful QC - from device design to applications. We then close by examining its future opportunities and obstacles in this space.

arXiv > quant-ph > arXiv:2204.04198

Search... Help | Ac

Quantum Physics

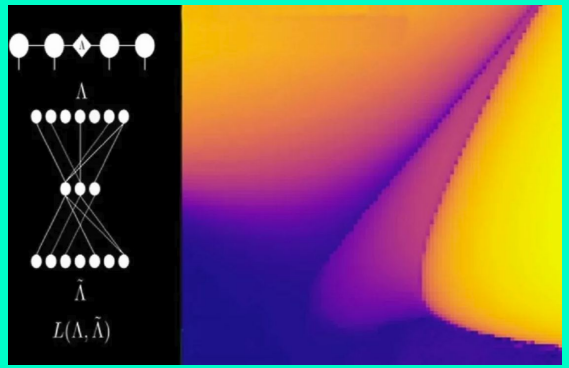
[Submitted on 8 Apr 2022 (v1), last revised 7 Jun 2025 (this version, v4)]

Modern applications of machine learning in quantum sciences

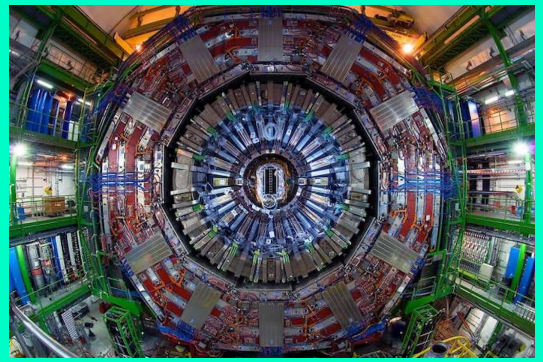
Anna Dawid, Julian Arnold, Borja Requena, Alexander Gresch, Marcin Płodzień, Kaelan Donatella, Kim A. Nicoli, Paolo Stornati, Rouven Koch, Miriam Büttner, Robert Okuła, Gorka Muñoz-Gil, Rodrigo A. Vargas-Hernández, Alba Cervera-Lierta, Juan Carrasquilla, Vedran Dunjko, Marylou Gabrié, Patrick Huembeli, Evert van Nieuwenburg, Filippo Vicentini, Lei Wang, Sebastian J. Wetzel, Giuseppe Carleo, Eliška Greplová, Roman Krems, Florian Marquardt, Michał Tomza, Maciej Lewenstein, Alexandre Dauphin

In this book, we provide a comprehensive introduction to the most recent advances in the application of machine learning methods in quantum sciences. We cover the use of deep learning and kernel methods in supervised, unsupervised, and reinforcement learning algorithms for phase classification, representation of many-body quantum states, quantum feedback control, and quantum circuits optimization. Moreover, we introduce and discuss more specialized topics such as differentiable programming, generative models, statistical approach to machine learning, and quantum machine learning.

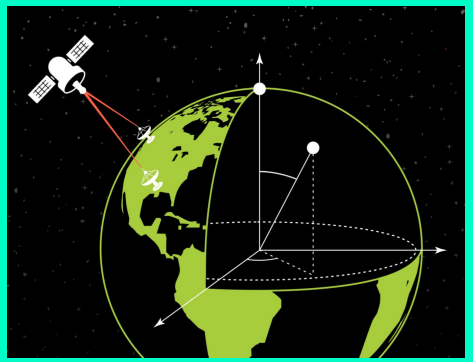
QUEDÓ EN EL TINTERO...



[machine learning phase diagrams]



[anomaly detection]



[Quantum comms]

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¡GRACIAS!

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