ICT

New schemes in Quantum Computing: Use of Machine Learning
New schemes in QC: use of Machine Learning

GOAL: Improving machine learning by leveraging a hybrid quantum/classical computing approach to decrease the time required to train machine learning models.

Highlights: Notable Public Funding Efforts

ParityQC: Parity Constraints as a Quantum Computing Toolbox
FWF START program (Austria). Study novel schemes for quantum computing based on parity variables and constraints.  

QSIT – Quantum Science & Technology is a program of the National Centre of Competence in Research (NCCR) of Switzerland which aims to develop applications in the area of quantum computer science and to investigate new paradigms in physical basic research such as the order and states of material.

A new DARPA’s RFI on #QuantumComputing asks what new capabilities current and next-gen quantum computers might enable for understanding complex physical systems, improving AI & ML, and enhancing distributed sensing.

The face of promising research:
Skolkovo IST  
Univ. Sevilla  
Jacob Biamonte  
Lucas Lamata  
Skoltech

Other leading research org in EU: Basque Country University, with 10.5 M € grant for an open superconducting quantum computer. Univ Pavia work on An Artificial Neuron Implemented on an Actual Quantum Processor.
Use of Machine Learning in Quantum Computing

The number of documents in this field has grown especially since 2018 and is expected to continue increasing.

Number of records in Quantum Computing Machine Learning [1]

Number of grants in Quantum Computing Machine Learning [2]

Highlighted companies: IBM worked with Raytheon BBN in 2017 to perform certain black box machine learning tasks more efficiently; There are also the solutions of Rigetti, D-Wave (Quadrant.ai) and Alibaba. In the context of chemistry, firms such as Volkswagen, Daimler and Google stand out.

GOOGLE’S QUANTUM PROCESSOR

The Bristlecone’s gate-based superconducting system provides a testbed for research into system error rates and scalability of Google’s qubit technology, as well as applications in quantum simulation, optimization, and machine learning. 