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Quantum Machine Learning - arXiv
Quantum Machine Learning Jacob Biamonte1,2,*, Peter Wittek3, Nicola Pancotti4, Patrick Rebentrost5, Nathan Wiebe6, and Seth Lloyd7 *jacobbiamonte@qubitorg 1Quantum Software Initiative, Skolkovo Institute of Science and Technology, Skoltech Building 3, Moscow 143026, Russia 2Institute for Quantum Computing, University of Waterloo, Waterloo, N2L 3G1 Ontario, …

Advances in quantum machine learning - arXiv
12 Quantum Machine Learning The rst problem encountered with quantum machine learning (QML) is its de nition By consider-ing a number of scenarios, we aim to clarify how machine learning and quantum mechanics can be combined, and whether we will consider these to be QML This is subjective and any deep theoreti-

Quantum Machine Learning Tensor NetworkStates
arXiv:180402398v2 [quant-ph] 31 Aug 2019 Quantum Machine Learning Tensor NetworkStates Jacob Biamonte,∗ Andrey Kardashin,† and Alexey Uvarov‡ Deep Quantum Laboratory, Skolkovo Institute of Science and Technology, 3 Nobel Street, Moscow, Russia 121205

Quantum machine learning for quantum anomaly detection
Quantum machine learning for quantum anomaly detection NANA LIU CQT AND SUTD, SINGAPORE ARXIV:171007405 TUESDAY 7TH NOVEMBER 2017 QTML 2017, VERONA

Quantum Machine Learning - hb.diva-portal.org
arXiv:161109347v1 [quant-ph] 28 Nov 2016 Quantum Machine Learning The interface of quantum physics and machine learning naturally goes both ways: machine learning al-gorithms find application in understanding and control-ling quantum systems and, on the other hand, quantum

computational devices promise enhancement of the per- formance of machine …

From Quantum Machine Learning to Quantum AI

1) Quantum Machine Learning Seth Lloyd (MIT), USA 2) Quantum Computing for Artificial Intelligence Hans Jürgen Briegel, (Innsbruck, Austria) 3) Artificial Intelligence for Quantum Information Processing Chin-Teng Lin (Sydney, Australia) 4) Quantum- and Bio-inspired Computational Intelligence Francisco Herrera (Granada, Spain) 5) Quantum

Quantum adiabatic machine learning with zooming

Quantum adiabatic machine learning with zooming Alexander Zlokapa1, Alex Mott2, Joshua Job3, Jean-Roch Vlimant1, Daniel Lidar4, and Maria Spiropulu1 1Division of Physics, Mathematics & Astronomy, Alliance for Quantum Technologies, California Institute of Technology, Pasadena, CA 91125, United States 2DeepMind Technologies, London, UK 3Lockheed Martin Corporation, …

Topics in Quantum Machine Learning - □□□□

Topics in Quantum Machine Learning Vedran Dunjko vdunjko@liacsleidenunivnl 1 ML→QIP (quantum-applied ML) [’74] QIP→ML (quantum-enhanced ML) [‘94] QIP⇝ML (quantum-generalized learning) [‘00] ML-insipred QM/QIP Physics inspired ML/AI Quantum Information Processing (QIP) Machine Learning/AI (ML/AI) Quantum Machine Learning (QML) 2 3 …

From Quantum Entanglement to Machine Learning

From Quantum Entanglement to Machine Learning Jing Chen □□□□ IOP, CAS yzcj105@126com arXiv:170104831 Outline •Tensor Network •Machine learning •Connections History Wilson NRG 1975 White DMRG 1992 Tensor Network Tensor Network matrix product tensor contraction Extend Represent wave functions R Orus Annals of Physics 349 (2014) …

Quantum generative adversarial learning

simple practical circuit ansatz to parametrize quantum machine learning mod-els and perform a simple numerical experiment to demonstrate that quantum generative adversarial networks can be trained successfully References [1]Pierre-Luc Dallaire-Demers and Nathan Killoran Quantum generative ad-versarial networks arXiv:180408641 2018

QuantumMachineLearningAlgorithms: ReadtheFinePrint

The algorithm at the center of the “quantum machine learning” mini-revolution is called HHL [9], after my colleagues Aram Harrow, Avinatan Hassidim, and Seth Lloyd, who invented it in 2008 Many of the subsequent quantum learning algorithms extend HHL or use it as a subroutine, so it’s important to understand HHL first (See also a

Reinforcement Learning Using Quantum Boltzmann Machines

a framework for training the network as a quantum Boltzmann machine (QBM) in the presence of a signi cant transverse eld for reinforcement learning This further improves the reinforcement learning method using DBMs Keywords Reinforcement learning, Machine learning, Neuro-dynamic programming, Markov decision process,

Introduction to Quantum Machine Learning M. Hilke (Quantum …

Quantum Machine Learning 1) Quantum data –classical machine Many useful applications Can use powerful classical ML codes (Deep Convolution NN) Often outperform non-ML approaches 2) Classical data –quantum machine Some powerful algorithms exist but many questions remain, particularly for the learning phase 1) Quantum data –quantum machine

The algorithm that changed quantum machine learning

quantum computing advances obso-lete Mathematicians and computer scientists in the machine learning field took notice, too Some acknowl-The Algorithm that Changed Quantum Machine Learning A college student discovered a classical computing algorithm that experts overlooked It promises to change both classical and quantum machine learning

Quantum Machine Learning - UCM

Quantum Machine Learning 13/12 /2018 Erik Torrontegui arXiv: 180100934 (2018) submitted to PhysRev Lett IFF - CSIC

QUANTUM MACHINE LEARNING

MACHINE LEARNING QUANTUM PHYSICS ‣ Improved machine learning using near term quantum circuits ‣ Quantum inspired tensor network learning Wittek, Quantum machine learning, Academic press (2014) Biamonte, Wittek, Pancotti, Rebentrost, Wiebe, Lloyd, Seth,Nature, 549, 195–202 (2017) Farhi, Neven, arXiv:180206002

A Survey of Quantum Learning Theory

tial speed-ups over classical machine learning, though one has to be careful about the underlying assumptions needed to make efficient quantum machine learning possible: in some cases these also make efficient classical machine learning possible Aaronson [Aar15] gives a brief but clear description of the issues These developments have been