Bibliografia per il Corso di Quantum Computing
tenuto per Epigenesys s.r.l.

Docenti: Sara Galatro*& Lorenzo Gasparini†
Supervisore: Prof. Marco Pedicini‡

Ottobre - Novembre 2023

Giorno 1

References

[1] Ronald de Wolf, *Quantum Computing: Lecture Notes*, arXiv:1907.09415v5, *2023*;

[2] Wolfgang Scherer, *Mathematics of Quantum Computing*, Springer, *2019*;

[3] Richard J. Lipton, Kenneth W. Regan, *Introduction to Quantum Algorithms via Linear Algebra*, Cambridge, Massachusetts: The MIT Press, Second Edition, *2021*;

[4] Michael A. Nielsen,Isaac L. Chuang, *Quantum Computation and Quantum Information - 10th Anniversary Edition*, Cambridge University Press, *2010*

[5] John Watrous, *Basic of Quantum Information*, IBM Quantum Learning: Basic of Quantum Information, *2023*;

[6] Link per la libreria di quantum computing utilizzata nelle esercitazioni: Qiskit

[7] Documentazione per la programmazione in Qiskit, versione 0.44.3, Ottobre 2023

[8] IBM Quantum Challenges, *Qiskit Global Summer School 2023: Lab1*

Giorno 2

References

[1] John Watrous, *Fundamentals of quantum algorithms*, IBM Quantum Learning: Fundamentals of quantum algorithms, *2023*;

[2] Ronald de Wolf, *Quantum Computing: Lecture Notes*, arXiv:1907.09415v5, *2023*;

[3] Wolfgang Scherer, *Mathematics of Quantum Computing*, Springer, *2019*;

[4] Richard Cleve, *Quantum Information Processing - Quantum Algorithm I*, Quantum Algorithm I, *2021*

[5] Circuit Library, versione 0.44.3, Ottobre 2023

*sar.galatro@stud.uniroma3.it
†lor.gasparini@stud.uniroma3.it
‡marco.pedicini@uniroma3.it

[6] Introduction to primitives

[7] Get started with the Estimator primitive

[8] Get started with the Sampler primitive

[9] IBM Quantum Challenges, *Qiskit Global Summer School 2023: Lab2*

Giorno 3

References

[1] John Watrous, *Fundamentals of quantum algorithms*, IBM Quantum Learning: Fundamentals of quantum algorithms, *2023*;

[2] Ronald de Wolf, *Quantum Computing: Lecture Notes*, arXiv:1907.09415v5, *2023*;

[3] Richard Cleve, *Quantum Information Processing - Quantum Algorithm I*, Quantum Algorithm I, *2021*

[4] Richard Cleve, *Quantum Information Processing - Quantum Algorithm II*, Quantum Algorithm II, *2021*

[5] Richard J. Lipton, Kenneth W. Regan, *Introduction to Quantum Algorithms via Linear Algebra*, Cambridge, Massachusetts: The MIT Press, Second Edition, *2021*;

[6] Frederic Magniez, Miklos Santha, Mario Szegedy, *Quantum Algorithms for the Triangle Problem*, arXiv:quant-ph/0310134v3, *2005*;

[7] Diogo Cruz, Romain Fournier, et al., *Efficient quantum algorithms for GHZ and W states, and implementation on the IBM quantum computer*, arXiv:1807.05572v1, *2018*;

[8] IBM Quantum Challenges, *Qiskit Global Summer School 2023: Lab3*

Giorno 4

References

[1] John Watrous, *Phase-estimation and factoring*, Phase-estimation and factoring, *2023*;

[2] Ronald de Wolf, *Quantum Computing: Lecture Notes*, arXiv:1907.09415v5, *2023*;

[3] Richard Cleve, *Quantum Information Processing - Quantum Algorithm II*, Quantum Algorithm II, *2021*

[4] Richard Cleve, *Quantum Information Processing - Quantum Algorithm III*, Quantum Algorithm III, *2021*

[5] Qiskit, *Iterative Quantum Phase Estimation Algorithm*, IPE Algorithm

[6] Gilles Brassard, Peter Hoyer, Alain Tapp, *Quantum Counting*, arXiv:quant-ph/9805082v1, *1998*;

[7] IBM Quantum Challenges, *Qiskit Global Summer School 2023: Lab4*

Giorno 5

References

[1] IBM, *Practical introduction to quantum-safe cryptography*, Quantum-safe cryptography, *2023*

[2] Ronald de Wolf, *Quantum Computing: Lecture Notes*, arXiv:1907.09415v5, *2023*

[3] Yifei Huang and Peter Love, *Feynman-path type simulation using stabilizer projector decomposition of unitaries*, Feynman simulation, *2021*

[4] Lukas Burgholzer, Hartwig Bauer, Robert Wille, *Hybrid Schrodinger-Feynman Simulation of Quantum Circuits With Decision Diagrams*, Hybrid Schrodinger-Feynman Simulation, *2021*

[5] Andrew Shi, *Recursive Path-Summing Simulation of Quantum Computation*, Path summing simulation, *2017*

[6] Edoardo Signorini, Francesco Stocco, *Il qubit logico e la correzione degli errori quantistici*, Qubit logico ed Error Correction,*2023*

[7] Stephane Beauregard, *Circuit for Shor's algorithm using 2n+3 qubits*, Shor with 2n+3 qubit, *2003*

[8] Craig Gidney, Martin Ekera, *How to factor 2048 bit RSA integers in 8 hours using 20 million noisy qubits*, Breaking RSA2048, *2021*

[9] Adam Kelly, *Simulating Quantum Computers Using OpenCL*, Quantum Simulation with OpenCL, *2018*

[10] Transpiler, versione 0.44.3, Ottobre 2023

[11] Target, versione 0.44.3, Ottobre 2023

[12] Quantum Technologies Public Report, QuantERA, 2023

[13] ''*Europe takes a quantum leap: six EuroHPC quantum computers to drive innovation*'', Cineca, 27/06/2023

[14] DiVincenzo's criteria, Wikipedia

[15] IBM Quantum Documentation: Processor types, IBM Quantum, Novembre 2023

[16] Google Quantum AI

[17] Google Cirq

[18] Google Quantum Library - GitHub

[19] ''*Quantum supremacy using a programmable superconducting processor*'', Nature, 2019

[20] Frank Arute, Kunal Arya, et al., ''*Quantum supremacy using a programmable superconducting processor*'', Nature, 2019

[21] Michael Kan, ''*Google Claims Quantum Computing Achievement, IBM Says Not So Fast*'', 2019

[22] Adrian Cho, ''*Ordinary computers can beat Google's quantum computer after all*'', Science, 2022

[23] Emily Conover, ''*The new light-based quantum computer Jiuzhang has achieved quantum supremacy*'', Science, 2020

[24] Servizio cloud Azure Quantum

[25] Code with Azure Quantum

[26] Atom Computing

[27] "*Quantum startup Atom Computing first to exceed 1,000 qubits*", Atom Computing, Ottobre 2023

[28] Karen Wintersperger, Florian Dommert, et al., "*Neutral Atom Quantum Computing Hardware: Performance and End-User Perspective*", arXiv:2304.14360v3, 15/09/2023

[29] AWS: Amazon Braket

[30] Amazon Braket - GitHub Examples

[31] Quantum computing - Engineering, Wikipedia

[32] Diego de Falco, Dario Tamascelli, "*An introduction to quantum annealing*", Research Gate: An introduction to Quantum Annealing, July 2011

[33] D-Wave: Systems

[34] Pegasus Topology, white paper, D-Wave

[35] Zephyr Topology, white paper, D-Wave

[36] D-Wave - GitHub

[37] Problem Formulation, white paper, D-Wave