Roberto Schiattarella

Curriculum Vitae

Department of Physics "Ettore Pancini"
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Research Gate
Linkedin *Skype*

Current Position

Sept. 2024 - present **Researcher - RTDA**, *(Art. 24, comma 3, lett. a, legge 240/2010) at Department of Physics Ettore Pancini*, University of Naples Federico II, Topic: Quantum Artificial Intelligence.

Education

Main

2023 **PhD, Quantum Technologies**, *University of Naples Federico II*, Italy.
Title of Thesis: Quantum Computational Intelligence;
Topics: Quantum Computing, Quantum Compiling, Artificial Intelligence, Genetic Algorithms, Fuzzy Logic, Machine Learning and Deep Learning

2020 **Master Degree, Physics**, *University of Naples Federico II*, Italy, 110/110 cum Laude.
Title of Thesis: Deep Neural Networks for Quantum Circuits Mapping

2018 **Bachelor Degree, Physics**, *University of Naples Federico II*, Italy, 110/110 cum Laude.

Others

2024 ***Summer School***, *Qiskit Global Summer School 2024: The Path to Utility*, IBM Quantum - *Online Excellence Certificate*

2022 ***Summer School, PhD Program In Quantum Technologies***, Scuola Superiore di Catania, Catania, Italy.

2019 ***Summer School, Italian Student Program***, Fermilab, Batavia, Illinois, United States.

Past Positions

01 Jun 2024 - 31 Jul 2024 **Research Fellow**, *Topic: Quantum Artificial Intelligence*, University of Naples Federico II, Italy.

Research Experience

21 Nov - 2 Dec 2022 **Visiting PhD Student**, *Quantum Technology Initiative - CERN OpenLab*, CERN, Geneva. Switzerland

2 - 15 Oct 2022 **Visiting PhD Student**, *Quantum Technology Initiative - CERN OpenLab*, CERN, Geneva. Switzerland

24 May - 23 Jun 2022 **Visiting PhD Student**, *Quantum Technology Initiative - CERN OpenLab*, CERN, Geneva. Switzerland

Position of Responsibility

2021- present **Expert member for QuantumNet S.R.L.**.

Research Grants and Project Activities

July 2023 ***IEEE CIS Conference Travel Grant***, *IEEE Conference on Evolutionary Computing*, IEEE.
Amount Founded: Dollars 1.000,00.

May 2022 ***IonQ Research Credits Program***, *Project Title: QUantum FUzzy inference for high energy Physics Applications (QUFUPA)*, IonQ.
Amount Founded: Dollars 10.000,00.

Oct 2022 ***IEEE CIS Graduate Student Research Grants***, *Project Title: QUantum FUzzy inference for high energy Physics Applications (QUFUPA)*, IEEE Computational Intelligence Society.
Amount Founded: Dollars 3.600,00.

Fellowships & Awards

January 2024 ***Fujitsu Quantum Simulator Challenge Winner***, *Fujitsu*, Project Title: 'Efficient and Interpretable Control of Smart Cities with Quantum Computers'.
Prize: Dollars 10.000,00

November 2020 – October 2023 ***Quantum Technologies Fellowship***, *of University of Naples Federico II, as a PhD research scholar in Naples, Italy.*

Invited Talks

20 November 2023 **Invited Speaker**, *IEEE R10 Strategic Planning and New Initiatives 2023 SPINC Activity*, Taiwan - (Online Presentation), Talk Title: The Quantum Fuzzy Inference Engine.
Invited by Prof. Chang Shing Lee

14 November 2022 **Invited Speaker**, *Workshop: Quantum Computing @ INFN*, Bologna, Talk Title: Quantum Fuzzy Inference in Particle Accelerator Control.
Invited by Prof. Concezio Bozzi

2022 **Invited Speaker**, *NTT DATA & Friends*, Naples.
Invited by NTT DATA Italia

2022 **Invited Speaker**, *Quantum Technology Initiative Journal Club (CERN)*, Virtual Meeting, Talk Title: Quantum Fuzzy Logic.
Invited by Dr. Michele Grossi

2022 **Invited Speaker**, *Quantum Technology Initiative Journal Club (CERN)*, Virtual Meeting, Talk Title: Quantum Genetic Sampling: Using Quantum Amplitude Amplification in Genetic Algorithms.
Invited by Dr. Michele Grossi

2020 **Invited Speaker**, *NetCom Group*, Virtual Meeting, Seminar Title (in Italian): Reti Neurali per il Mapping di Circuiti su Processori Quantistici.
Invited by NetCom Group

Conference Activities

2025 **Local Arrangement Chair**, *IEEE International Conference on Quantum Artificial Intelligence*, (IEEE QAI 2025), Naples, Italy.

2025 **Technical Program Committee Member**, *IEEE International Joint Conference on Neural Networks*, (IEEE IJCNN 2025), Rome, Italy.

2025 **Technical Program Committee Member**, *IEEE Conference on Evolutionary Computation 2025*, (IEEE CEC 2025), Hangzhou, China.

2024 **Leader Organizer**, *Qiskit Fall Fest 2024 @ UNINA*, (QFF 2024), Naples, Italy.

2024 **Technical Program Committee Member**, *IEEE Conference on Artificial Intelligence*, (IEEE CAI 2024), Singapore.

2023 **Local Arrangement Chair**, *IEEE Workshop on Quantum Artificial Intelligence*, (QAI 2023), Naples, Italy.

2023 **Technical Program Committee Member**, *IEEE International Conference on Fuzzy Systems*, (FUZZ-IEEE 2023), Incheon, South Corea.

2023 **Session Chair**, *IEEE Conference on Evolutionary Computation 2023*, (IEEE CEC 2023), Chicago, USA.
Session Title: Estimation of Distribution

2023 **Technical Program Committee Member**, *IEEE Conference on Evolutionary Computation 2023*, (IEEE CEC 2023), Chicago, USA.

2022 **Local Arrangement Chair**, *2022 Quantum Techniques in Machine Learning*, (QTML 2022), Napoli, Italy.

2022 **Technical Program Committee Member**, *2022 IEEE World Congress On Computational Intelligence*, (IEEE WCCI 2022), Padova, Italy.

Talks

30 October 2024 **Speaker**, *Title: Quantum Fuzzy Logic*, Workshop Quantum Computing @ INFN 2024.
Padova, Italy

14 August 2023 **Speaker**, *Title: Distributing Fuzzy Inference Engines on Quantum Computers*, 2023 IEEE International Conference on Fuzzy Systems, (FUZZ-IEEE 2023).
Incheon, South-Corea

14 August 2023 **Speaker**, *Title: A Comparison of Quantum Computer Architectures in Running Fuzzy Inference Engines*, 2023 IEEE International Conference on Fuzzy Systems, (FUZZ-IEEE 2023).
Incheon, South-Corea

28 July 2023 **Speaker**, *Title: Quantum Fuzzy Control for Particle Beams*, IEEE Workshop on Quantum Artificial Intelligence, (QAI 2023).
Napoli, Italy

5 July 2023 **Speaker**, *Title: Genetic Algorithms for Constructing Effective Nuclear Shell Hamiltonians*, IEEE Conference on Evolutionary Computation 2023, (CEC 2023).
Chicago, USA

3 July 2023 **Speaker**, *Title: On The Effect of Quantum Noise in Quantum Genetic Algorithms*, IEEE Conference on Evolutionary Computation 2023, (CEC 2023).
Chicago, USA

10 November 2022 **Speaker**, *Title: Quantum Fuzzy Control for Particle Beams*, Quantum Techniques in Machine Learning 2022, (QTML 2022).
Napoli, Italy

19 July 2022 **Speaker**, *Title: Implementing Defuzzification Operators on Quantum Annealers*, 2022 IEEE World Congress On Computational Intelligence, (WCCI 2022- FUZZ-IEEE Session).
Padova, Italy

21 July 2022 **Speaker**, *Title: Quantum Mating Operator: A New Approach to Evolve Chromosomes in Genetic Algorithms*, 2022 IEEE World Congress On Computational Intelligence, (WCCI 2022- IEEE CEC Session).
Padova, Italy

12 July 2021 **Speaker**, *Title: Quantum genetic selection: Using a quantum computer to select individuals in genetic algorithms*, The Genetic and Evolutionary Computation Conference 2021 (GECCO 2021), Lille, France.
(online talk)

13 July 2021 **Speaker**, *Title: Measuring distance between quantum states by fuzzy similarity operators*, 2021 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2021), Luxembourg.
(online talk)

Editorial Activities

Reviewer, *IEEE Transactions on Fuzzy Systems*(*Journal Web-site*).

Reviewer, *Springer Quantum Machine Intelligence* (*Journal Web-site*).

Reviewer, *Springer Applied Intelligence (Journal Web-site).*

Reviewer, *IEEE Communications Letters (Journal Web-site).*

Reviewer, *IEEE Transactions on Emerging Topics in Computational Intelligence (Journal Web-site).*

Teaching Experience

Nov. 2024 **Lecturer**, Qiskit Fall Fest 2024 @ UniNa.
Univeristà degli studi di Napoli Federico II

Mar. 2024 - June 2024 **Teaching Assistant**, *Computational Intelligence*, University of Naples Federico II, Italy.
Course leader: Prof. Ferdinando Di Martino

Mar. 2023 - Jun. 2023 **Teaching Assistant**, *Computational Intelligence*, University of Naples Federico II, Italy.
Course leader: Prof. Ferdinando Di Martino

Mar. 2023 **Teaching Assistant**, *Quantum Algorithms*, University of Naples Federico II, Italy.
Course leader: Prof. Giovanni Acampora

Jan. 2023 - Jun. 2023 **Lecturer & Tutor**, Quantum Computing Academy First Edition.
Univeristà degli studi di Napoli Federico II & QuantumNet

Sep. 2022 **Lecturer Assistant**, *Introduction to Quantum Computing*, "2.1 Industry innovation: Big data and analytics, Machine learning and IOT" module, Aerotech Academy - Leonardo S.p.A.
Module leader: Prof. Giovanni Acampora

Mar. 2022 - Jun. 2022 **Teaching Assistant**, *Computational Intelligence*, University of Naples Federico II, Italy.
Course leader: Prof. Ferdinando Di Martino

Apr. 2022 **Lecturer**, *Introduction to Neural Networks for Electronic Device Applications*, Istituto Nazionale di Fisica Nucleare INFN, Italy.

Sept. 2021 - Feb. 2022 **Teaching Assistant**, *Quantum Computing and Artificial Intelligence*, University of Naples Federico II, Italy.
Prof. Giovanni Acampora

Sep. 2021 - May 2022 **Tutor Coordinator**, *General Physics I-II*, DIETI, University of Naples Federico II, Italy.

Thesis Supervision

Spt. 2024 - Dec. 2024 **Daily Supervisor**, *Bachelor Degree in Physics - University of Naples Federico II*, Student: Giulio Minolfi, Thesis Title: Soluzione del Problema di Ising tramite Algoritmi Genetici Quantistici.
Supervisor: prof. Giovanni Acampora

Aug. 2023 - Mar. 2024 **Daily Supervisor**, *Master Degree in Data Science - University of Naples Federico II*, Student: Vincenza Liguori, Thesis Title: A Quantum Evolutionary Strategy for training Neural Networks.
Supervisor: dr. Autilia Vitiello

Mar. 2022 - Dec. 2022 **Daily Supervisor**, *Master Degree in Physics - University of Naples Federico II*, Student: Vincenzo Lipardi, Thesis Title: A Quantum Evolutionary Strategy for Optimization Problems.
Supervisor: prof. Giovanni Acampora

Member of Boards for Appointments and Promotions

2024 **Member of Recruiting Committee**, *appointment to Research Scholar*, Candidate Name: Angela Chiatto, University of Naples Federico II - Ref: 36-2024/TIPB/DF.
Research Fund Manager: Dr. Autilia Vitiello

Participation in National and International Research Groups

2022 - present **Participation in National Research Groups**, *Participation in the activities of the Istituto Nazionale di Fisica Nucleare (INFN) - Sezione di Napoli*, Project Title: ATLAS.

2022 - present **Participation in International Research Groups**, *Collaboration with Dr. Michele Grossi*, CERN OpenLab, CERN, Switzerland.

2021 - present **Participation in International Research Groups**, *Member of the IEEE Computational Intelligence Society*.

2021 - present **Participation in International Research Groups**, *Collaboration with Prof. Amir Pourabdollah*, Nottingham Trent University, England.

2022 - present **Participation in National Research Groups**, *Collaboration with the research group of the Dr. Giovanni Di Gregorio*, Università degli Studi della Campania "Luigi Vanvitelli" , Italy.

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Certifications

2024 **IBM Quantum Challenge**, *Online Badge*, Issued by IBM.

2023 **IBM Quantum Challenge - Spring 2023**, *Online Badge*, Issued by IBM.

2022 **NVIDIA DLI Fundamentals of Deep Learning**, *Online Badge*, Issued by NVIDIA Deep Learning Initiative.

2021 **24-CFU for Teaching**, *University of Naples Federico II*, Italy, Topics: Educational Psychology, School and Experimental Pedagogy, Cultural Anthropology.

2021 **IBM Quantum Challenge - Fall 2021**, *Achievement: Advanced*, *Online Badge*, Issued by IBM.

Publications

In Journal Articles

2024 Halima G Ahmad, **Roberto Schiattarella**, Pasquale Mastrovito, Angela Chiatto, Anna Levochkina, Martina Esposito, Domenico Montemurro, Giovanni P Pepe, Alessandro Bruno, Francesco Tafuri, et al. Mitigating errors on superconducting quantum processors through fuzzy clustering. *Advanced Quantum Technologies*, page 2300400. Wiley Online Library, 2024.

2024 Giovanni Acampora, Michele Grossi, Michael Schenk, and **Roberto Schiattarella**. Quantum fuzzy inference engine for particle accelerators control. *IEEE Transactions on Quantum Engineering*. IEEE, 2024.

2023 Giovanni Acampora, **Roberto Schiattarella**, and Autilia Vitiello. On the implementation of fuzzy inference engines on quantum computers. *IEEE Transactions on Fuzzy Systems*, volume 31, pages 1419–1433, 2023.

2023 Giovanni Acampora, Ferdinando Di Martino, Alfredo Massa, **Roberto Schiattarella**, and Autilia Vitiello. D-nisq: a reference model for distributed noisy intermediate-scale quantum computers. *Information Fusion*, volume 89, pages 16–28. Elsevier, 2023.

2022 Francesco Di Colandrea, Lorenzo Amato, **Roberto Schiattarella**, Alexandre Dauphin, and Filippo Cardano. Retrieving space-dependent polarization transformations via near-optimal quantum process tomography. Optica Open, 2022.

2022 Giovanni Acampora, **Roberto Schiattarella**, and Autilia Vitiello. Using quantum amplitude amplification in genetic algorithms. *Expert Systems with Applications*, page 118203, 2022.

2021 Giovanni Acampora, **Roberto Schiattarella**, and Alfredo Troiano. A dataset for quantum circuit mapping. *Data in Brief*, page 107526. Elsevier, 2021.

2021 Giovanni Acampora and **Roberto Schiattarella**. Deep neural networks for quantum circuit mapping. *Neural Computing and Applications*, pages 1–21. Springer, 2021.

2021 Giovanni Acampora, Amir Pourabdollah, and **Roberto Schiattarella**. Fuzzy logic on quantum annealers. *IEEE Transactions on Fuzzy Systems*, pages 1–1, 2021.

In Conference Proceedings

2024 Giovanni Acampora, **Roberto Schiattarella**, and Autilia Vitiello. Using quantum fuzzy inference engines in smart cities. In *2024 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, pages 1–8. IEEE, 2024.

2024 Giovanni Acampora, Angela Chiatto, Stefano De Luca, Roberta Di Pace, Chiara Fiori, Enrico Landolfi, Alfredo Massa, **Roberto Schiattarella**, and Autilia Vitiello. Application of quantum genetic algorithms to connected and electric vehicles energy consumption optimization. In *2024 IEEE 8th Forum on Research and Technologies for Society and Industry Innovation (RTSI)*, pages 530–535, 2024.

2023 Amir Pourabdollah, Colin Wilmott, **Roberto Schiattarella**, and Giovanni Acampora. Fuzzy inference on quantum annealers. In *2023 IEEE International Conference on Fuzzy Systems (FUZZ)*, pages 1–6, 2023.

2023 Giovanni Acampora and **Roberto Schiattarella**. On the effect of quantum noise in quantum genetic algorithms. In *2023 IEEE Congress on Evolutionary Computation (CEC)*, pages 1–8, 2023.

2023 Giovanni Acampora, Alfredo Massa, **Roberto Schiattarella**, and Autilia Vitiello. Distributing fuzzy inference engines on quantum computers. In *2023 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, pages 1–6, 2023.

2023 Giovanni Acampora, Michele Grossi, and **Roberto Schiattarella**. A comparison of quantum computer architectures in running fuzzy inference engines. In *2023 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, pages 1–6, 2023.

2023 Giovanni Acampora, Angela Chiatto, Stefano de Luca, Roberta Di Pace, Alfredo Massa, **Roberto Schiattarella**, and Autilia Vitiello. Application of quantum genetic algorithms to network signal setting design. In *2023 IEEE Congress on Evolutionary Computation (CEC)*, pages 1–8, 2023.

2023 Giovanni Acampora, Angela Chiatto, Luigi Coraggio, Giovanni De Gregorio, **Roberto Schiattarella**, and Autilia Vitiello. Genetic algorithms for constructing effective nuclear shell-model hamiltonians. In *2023 IEEE Congress on Evolutionary Computation (CEC)*, pages 1–8, 2023.

2022 Amir Pourabdollah, Giovanni Acampora, and **Roberto Schiattarella**. Implementing defuzzification operators on quantum annealers. In *2022 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, pages 1–6, 2022.

2022 Giovanni Acampora, **Roberto Schiattarella**, and Autilia Vitiello. Quantum mating operator: A new approach to evolve chromosomes in genetic algorithms. In *2022 IEEE Congress on Evolutionary Computation (CEC)*, pages 1–8, 2022.

2021 Giovanni Acampora, **Roberto Schiattarella**, and Autilia Vitiello. Quantum genetic selection: Using a quantum computer to select individuals in genetic algorithms. In *Proceedings of the Genetic and Evolutionary Computation Conference Companion*, GECCO '21, page 219–220, New York, NY, USA, 2021. Association for Computing Machinery.

2021 Giovanni Acampora, Ferdinando Di Martino, **Roberto Schiattarella**, and Autilia Vitiello. Measuring distance between quantum states by fuzzy similarity operators. In *2021 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, pages 1–6, 2021.