Andrea Cacioppo

Curriculum vitae - April 15, 2025

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andrea-cacioppo

Education

pres. **Ph.D. in Physics**, *Sapienza University of Rome*, Italy
Nov 2022 *Topics*: quantum generative models and physics-informed optimization algorithms
Group: Fisica AI&QC group
Supervisors: Stefano Giagu, Fabio Sciarrino

Nov 2021 **Ph.D. in Computer Engineering**, *Technical University of Munich*, Germany
Nov 2020 (interrupted) *Topics*: classical-quantum compound channels and algorithms for the automatic generation of quantum graph states
Group: Theoretical quantum system design group
Supervisors: Janis Nötzel, Jonathan Finley

May 2020 **M.Sc. in Theoretical Physics**, *Sapienza University of Rome*, Italy
Oct 2016 *Thesis*: "Deep learning for the parameter estimation of tight-binding Hamiltonians"
Supervisors: Stefano Giagu, Stefan Bauer
Grade: 109/110

Oct 2016 **B.Sc. in Physics**, *Sapienza University of Rome*, Italy
Sep 2013 *Thesis*: "Hidden Markov model"
Supervisor: Luciano Pietronero
Grade: 110/110 with honors

Work Experience

pres. **ML Consulting**, *Individual clients*, Italy
Jan 2022 *Topics*: training NNs to solve PDEs in finance - implementation of diffusion models - training NNs on incomplete datasets - invoice reconciliation using an online LLM

Mar. 2025 **ML Consulting**, *Grid +*, Rome, Italy
Nov 2024 *Topic*: Automatic analysis of legal documents and anomaly detection

Nov 2024 **Tutoring**, *Individual clients*, Italy
Jan 2022 *Topics*: mathematics, physics and computer science for university students

Nov 2023 **ML Consulting**, *Hypercube SA*, Lugano, Switzerland
Sep 2023 *Topic*: application of ML techniques to the detection of time series anomalies

Aug 2023 **ML Consulting**, *Primis Group SRL*, Milan, Italy
Dec 2022 *Tasks*: determine best ML solutions tailored to LiDAR and satellite data, design of an anomaly detection algorithm for LiDAR data (contract of *Rete Ferroviaria Italiana SPA*)

Nov 2021 **Tutoring**, *Technical University of Munich*, Germany
Nov 2020 *Task*: assisting students of the "Quantum networking" class

Oct 2020 – Sep 2019 **Research Internship**, *Max Planck Institute for Intelligent Systems*, Tübingen, Germany

Topics: Deep learning for estimating tight-binding Hamiltonians, quantum machine learning models and their connection with kernel methods

Awards and grants

Nov 2024 **Research grant**, *Sapienza University of Rome*, Italy

Nov 2023 "Development of quantum machine learning algorithms" - 1000 €

Oct 2016 **Excellence program for honor students**, *Sapienza University of Rome*, Italy

Talks

Oct 2024 **Quantum Computing @ INFN, Padova, Italy**, Talk

"Quantum diffusion models for quantum data learning"

Oct 2024 **38° cycle PhD seminar, Rome, Italy**, Talk

"Quantum machine learning and physics-informed deep learning algorithms"

Apr 2024 **EuCAIFCon2024, Amsterdam, Netherlands**, Flash Talk

"Quantum diffusion models

Nov 2023 **QAIxIAQ2023 Workshop, Rome, Italy**, Talk

"Quantum diffusion models using parameterized quantum circuits for data denoising"

July 2021 **ISIT, 2021 IEEE International Symposium on Information Theory**, Talk

"Compound channel capacities under energy constraints and application"

Languages

Native Italian

Fluent English

Beginner German

Software

Advanced Python, PyTorch

Good Tensorflow, GitHub, Linux, LaTeX

Basic C, HTML

Publications

[1] Andrea Cacioppo, Lorenzo Colantonio, Simone Bordoni, and Stefano Giagu. Quantum Diffusion Models. *arXiv preprint arXiv:2311.15444*, 2023.

[2] Andrea Cacioppo, Janis Nötzel, and Matteo Rosati. Compound Channel Capacities under Energy Constraints and Application. In *2021 IEEE International Symposium on Information Theory (ISIT)*, pages 640–645. IEEE, 2021.

[3] Andrea Cacioppo. Deep learning for the parameter estimation of tight-binding Hamiltonians. Master's thesis, Sapienza Università di Roma, Italy, 2020.

[4] Lorenzo Colantonio, Andrea Cacioppo, Federico Scarpati, and Stefano Giagu. Efficient graph coloring with neural networks: A physics-inspired approach for large graphs. *arXiv preprint arXiv:2408.01503*, 2024.