Giacomo Franceschetto

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Interests

Quantum Information Theory, Quantum Computing, Artificial Intelligence

Education

Ph.D. - "la Caixa" Foundation Fellow *Dec 2023*

The Institute of Photonic Sciences (ICFO), Barcelona (ES)

Group: Quantum Information Theory – Antonio Acín

M.Sc. in Physics of Data *Oct 2021 - Oct 2023*

University of Padova – GPA: 29.54/30, Final Grade: 110/110 with honors

- Exchange semester: Leopold-Franzens Universität Innsbruck – MSc in Quantum Sciences.
- Core Lectures: Advanced Quantum Information, Mathematics and Computation, Neural Networks and Deep Learning.

B.Sc. in Physics *Oct 2018 - Jul 2021*

University of Padova – GPA: 29.30/30, Final Grade: 110/110 with honors

- Elective Lectures: Computational Physics, Object Oriented Programming, Quantum Information Theory.

Work Experience

Quandela, Massy (FR)

Quantum Applications Engineer (Remote) *Sep 2023 - Dec 2023*

- Developed a software framework to tackle general reinforcement learning tasks with quantum optical projective simulation on single-photon-based quantum computers.

Quantum Applications Engineer Intern *Mar 2023 - Sep 2023*

- Implemented a task-tailored version of the quantum optical projective simulation algorithm for a test bed reinforcement learning task on a single-photon-based quantum computer.

Institute for Quantum Optics and Quantum Information (IQOQI), Innsbruck (AT) *Oct 2022 - Feb 2023*

Student Intern

Group: Superconducting Quantum Circuits – Gerhard Kirchmair

- Conducted characterization measurements on transmon qubits in the dispersive regime.

The Institute of Photonic Sciences (ICFO), Barcelona (ES) *Jul 2022 - Sep 2022*

Research Intern

Group: Quantum Information Theory – Antonio Acín, *Supervisor*: Dr. Márcio M. Taddei

- Analysed and developed different QUBO encodings of an optimisation problem of industrial interest with the perspective of then solving it with a quantum annealer.

Honors

"La Caixa" Foundation Incoming Fellowship. Granted funding to conduct PhD studies, acceptance rate: 5%.

Empowering the Future Experts in Quantum Science and Technology for Europe (EFEQT) 2022/23. Among the 25 Master students selected to perform a one year training programme in Quantum Science and Technology.

***Mille e una lode* Scholarship 2019, 2020, 2021.** Awarded by University of Padova to top 3% students.

Lead the Future Mentorship (LTF). Selected to be mentee for LTF, a leading mentorship non-profit organization for students in STEM, with an acceptance rate below 20%.

Publications

G. Franceschetto, M Płodzień, M Lewenstein, A Acín, P Mujal. **Harnessing quantum back-action for time-series processing**. , 2024. [arXiv]

G. Franceschetto, A. Ricou. **Demonstration of quantum projective simulation on a single-photon-based quantum computer**. *Physical Review A 110 (6), 062613*, 2024. [arXiv]

A. Makarov, C. Pérez-Herradón, G. Franceschetto et al. **Quantum Optimization Methods for Satellite Mission Planning**. *IEEE Access, vol. 12, pp. 71808-71820*, 2024. [arXiv]

A. Makarov, M. M. Taddei, E. Osaba, G. Franceschetto et al. **Optimization of Image Acquisition for Earth Observation Satellites via Quantum Computing**. *Accepted paper at IDEAL 2023*, 2023. [arXiv]

Talks

Demonstration of quantum projective simulation on a single-photon-based quantum computer.

- *Contributed talk at ICE-9 Quantum Information in Spain, Puerto de la Cruz (Tenerife), 14 November 2024*
- *Invited talk at Quantum Information seminar, University of Innsbruck, 30 October 2024*
- *Invited seminar at IFISC Quantum meetings, University of the Balearic Islands, 21 May 2024*
- *Invited talk at Open Problems in Quantum Machine Learning, University of Milan, 24 November 2023*

Quantum Zeno effect as a reshaping tool for Hamiltonian learning.

- *Invited talk at Physics of Data Spring Workshop, University of Padova, 23 May 2024*