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Ugo Nzongani

EDUCATION

PhD Candidate in Quantum Computing   **2023 - 2026 (Ongoing)**
Aix-Marseille University, ENSTA Paris, Institut Polytechnique de Paris

Subject: Quantum walks for combinatorial optimization
Supervisors: Prof. Giuseppe Di Molfetta, Prof. Andrea Simonetto

Master of Quantum and Distributed Computer Science with honours   **2021 - 2023**
Paris-Saclay University

Main courses: Quantum Computing, Quantum Information, High Performance Computing, Distributed Algorithms, Advanced Algorithmic, Optimization, Complexity Theory

Bachelor of Computer Science with honours   **2018 - 2021**
Paris-Saclay University

Main courses: Functional Programming, Data Structures, Algorithmic, Machine Learning, C/Python/Java/Assembly Programming, Logic

Baccalauréat Scientifique, equivalent to High School GB A levels with honours   **2018**
Fustel de Coulanges high school, Massy

Main courses: Mathematics, Physics, Biology

WORK EXPERIENCE

Volunteering - LOC   **April 2023**
Ecole Polytechnique - International Physicists' Tournament   *Palaiseau - France*

- I participated in the 15th edition of the IPT as a member of the Local Organizing Committee. This is an international tournament for physics students where so-called "Physics Fight" takes place four days of the week. A fight is a scientific debate between 3 teams around challenge they have been studying for several months.

Research Internship   **5 months - 2023**
Paris-Saclay University - Laboratoire de Méthodes Formelles - QuaCS Team   *Orsay - France*

- Subject: Dirac quantum walk on tetrahedra
  Supervisor: Prof. Pablo Arrighi

Math tutor   **7 months - 2023**
Acadomia   *Massy - France*

- Private math lessons to high school students

Research Internship   **2 months - 2022**
INRIA - Laboratoire de Méthodes Formelles - QuaCS Team   *Orsay - France*

- Subject: Quantum circuits for quantum walk with position-dependent coin operators
  Supervisor: Dr. Pablo Arnault

PUBLICATIONS

- Nzongani, U., Simonetto, A., Di Molfetta, G.Non-unitary enhanced transfer efficiency in quantum walk search on complex networks. Physical Review A 112, 052451 (2025).

- Zylberman, J., Nzongani, U., Simonetto, A., Debbasch, F.Efficient Quantum Circuits for Non-Unitary and Unitary Diagonal Operators with Space-Time Accuracy trade-offs. ACM Transaction on Quantum Computing (2025).

- Nzongani, U., Eon, N., Márquez-Martín, I. et al. Dirac quantum walk on tetrahedra. Physical Review A 110, 042418 (2024).

- Nzongani, U., Arnault P.Adjustable-depth quantum circuit for position-dependent coin operators of discrete-time quantum walks. Quantum Information Processing 23, 193 (2024).

- Nzongani, U., Zylberman, J., Doncecchi, CE. et al. Quantum circuits for discrete-time quantum walks with position-dependent coin operator. Quantum Information Processing 22, 270 (2023).

PREPRINTS

- Nzongani, U., Laplace Mermoud, D., , Braida, A.Scaling QAOA: transferring optimal adiabatic schedules from small-scale to large-scale variational circuits.

- Nzongani, U., Laplace Mermoud, D., Simonetto, A., Di Molfetta, G.Sampled-Based Guided Quantum Walk: Non-variational quantum algorithm for combinatorial optimization.

TALKS

- Sampled-Based Guided Quantum Walk: Non variational quantum algorithm for combinatorial optimization, *Quantum days AMU 2025, CIRM, Marseille*

- Sampled-Based Guided Quantum Walk: Non variational quantum algorithm for combinatorial optimization, *PGMO DAYS 2025, EDF LAB, Saclay*

- Hybrid Quantum Search on Complex Networks: Noisy Spatial Search with Quantum Stochastic Walks, *PGMO DAYS 2024, EDF LAB, Saclay*

- Hybrid Quantum Search on Complex Networks: Noisy Spatial Search with Quantum Stochastic Walks, *Quantum ETS Seminar 2024, Montréal*

SKILLS

Programming	Python, OCaml, Java, C, C++, Julia, LaTeX, HTML, CSS, PHP
Communication	French (native), English (885/990 TOEIC)