Pau Escofet

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About Me

PhD Candidate in Quantum Computing Architectures at Polytechnic University of Catalonia (UPC), bridging the gap between theory and implementation in quantum systems. I focus on quantum circuit compilation, error correction, and graph-based modeling to enhance the scalability and performance of realistic quantum devices.

Education

- **Princeton University** — *November 2025 - May 2026*
  Visiting PhD Student — Princeton, New Jersey, USA
  - Advisor: Margaret Martonosi
- **Polytechnic University of Catalonia** — *September 2023 -*
  PhD in Quantum Computing Architecture — Barcelona, Spain
  - Thesis: Architecting a Million-Qubit Computer
  - Advisors: Sergi Abadal, Carmen G. Almudéver, Eduard Alarcón
- **Polytechnic University of Catalonia** — *September 2022 - June 2023*
  Advanced Telecommunication Technologies Master's Degree — Barcelona, Spain
  - 9.13 / 10
- **ETH Zurich** — *September 2021 - February 2022*
  Exchange Semester — Zurich, Switzerland
- **Polytechnic University of Catalonia** — *September 2017 - February 2022*
  Computer Science Bachelor's Degree — Barcelona, Spain
  - 7.95 / 10

Experience

- **Polytechnic University of Catalonia** — *September 2022 - June 2023*
  Research assistant — Barcelona, Spain
  - Master's student research assistant on compilation techniques for modular quantum computing architectures at the N3CAT group, UPC.
- **Twilio** — *July 2021 - October 2022*
  Software engineer intern — Madrid, Spain
  - Developed features for the certificate (SSL) chain validation service (Java, Python) and integrated the service with the full pipeline.
- **SEAT** — *February 2021 - June 2021*
  Software engineer intern — Martorell, Spain
  - Developed a platform to handle the massive data that vehicle validation generates. Working in the Quality Tests and Releases team.
- **Polytechnic University of Catalonia** — *August 2020 - June 2021*
  Research assistant — Barcelona, Spain
  - Bachelor's student research assistant on graph theory at the CS department of UPC.
- **Nakima** — *April 2019 - May 2020*
  Software engineer intern — Barcelona, Spain
  - Developed full-stack web applications using MEAN (MongoDB, Express, Angular and Node.js) in a Linux environment.

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, S=IN SUBMISSION, T=THESIS

[S.1] Escofet, P., Alarcón, E., Abadal, S., Semenov, A., Murphy, N., Blokhina, E., & Almudéver, C. G. (2025). Quantum Reverse Mapping: Synthesizing an Optimal Spin Qubit Shuttling Bus Architecture for the Surface Code. *arXiv preprint arXiv:2510.17689*.

[J.6] Palesi, M., Russo, E., Ascia, G., Rafique, H., Patti, D., Catania, V., ... & Almudéver, C. G. (2025). Assessing the Role of Communication in Modular Multi-Core Quantum Systems. *ACM Transactions on Design Automation of Electronic Systems*.

[C.6] Bhattacharjee, R., Escofet, P., Rodrigo, S., Abadal, S., Almudever, C. G., & Alarcón, E. (2025). Characterizing Scaling Trends of Post-Compilation Circuit Resources for NISQ-era QML Models. In *2025 IEEE International Conference on Quantum Artificial Intelligence (QAI)*. IEEE.

[C.5] Escofet, P., Das, A., Ben Rached, S., Rodrigo, S., Domingo, J., Sebastiano, F., ... & Almudever, C. (2025). On the Impact of Classical and Quantum Communication Networks Upon Modular Quantum Computing Architecture System Performance. *In 2025 IEEE International Conference on Quantum Computing and Engineering (QCE)*. IEEE.

[J.5] Escofet, P., Rodrigo, S., Garcia-Sáez, A., Alarcon, E., Abadal, S., & G. Almudever, C. (2025). An Accurate and Efficient Analytic Model of Fidelity Under Depolarizing Noise Oriented to Large Scale Quantum System Design. *Quantum Science and Technology*.

[C.4] Escofet, P., Semenov, A., Murphy, N., Blokhina, E., Abadal, S., Alarcón, E., & Almudéver, C. G. (2025, May). Compilation Techniques for Spin Qubits in a Shuttling Bus Architecture. *In 2025 IEEE International Symposium on Circuits and Systems (ISCAS)* (pp. 1-5). IEEE.

[J.4] Escofet, P., Ovide, A., Bandic, M., Prielinger, L., Van Someren, H., Feld, S., ... & Almudever, C. (2025). Revisiting the mapping of quantum circuits: Entering the multi-core era. *ACM Transactions on Quantum Computing*, 6(1), 1-26.

[J.3] Bandic, M., le Henaff, P., Ovide, A., Escofet, P., Rached, S. B., Rodrigo, S., ... & Feld, S. (2025). Profiling quantum circuits for their efficient execution on single-and multi-core architectures. *Quantum Science and Technology*, 10(1), 015060.

[C.3] Escofet, P., Gonzalvo, A., Alarcón, E., Almudéver, C. G., & Abadal, S. (2024, September). Route-forcing: Scalable quantum circuit mapping for scalable quantum computing architectures. *In 2024 IEEE International Conference on Quantum Computing and Engineering (QCE)* (Vol. 1, pp. 909-920). IEEE.

[C.2] Pastor, A., Escofet, P., Rached, S. B., Alarcón, E., Barlet-Ros, P., & Abadal, S. (2024, May). Circuit partitioning for multi-core quantum architectures with deep reinforcement learning. *In 2024 IEEE International Symposium on Circuits and Systems (ISCAS)* (pp. 1-5). IEEE.

[C.1] Escofet, P., Rached, S. B., Rodrigo, S., Almudever, C. G., Alarcón, E., & Abadal, S. (2023, October). Interconnect fabrics for multi-core quantum processors: A context analysis. *In Proceedings of the 16th International Workshop on Network on Chip Architectures* (pp. 34-39).

[J.2] Escofet, P., Ovide, A., Almudever, C. G., Alarcón, E., & Abadal, S. (2023). Hungarian qubit assignment for optimized mapping of quantum circuits on multi-core architectures. *IEEE Computer Architecture Letters*, 22(2), 161-164.

[T.2] Escofet, P. (2023). Architecture-Based Mapping Algorithm for Multi-Core Quantum Computers *(Master's thesis, Polytechnic University of Catalonia)*.

[T.1] Escofet, P. (2021). Spectral methods for graph drawing and synthesis of integrated circuits *(Bachelor's thesis, Polytechnic University of Catalonia)*.

[J.1] Zhang, Q., Sanchez-Fuentes, D., Desgarceaux, R., Escofet-Majoral, P., Oró-Soler, J., Gazquez, J., ... & Carretero-Genevrier, A. (2019). Micro/nanostructure engineering of epitaxial piezoelectric α-quartz thin films on silicon. *ACS Applied Materials & Interfaces*, 12(4), 4732-4740.

SKILLS

- **Programming Languages:** C, C++, Python, JavaScript, Java, Haskell
- **Data Science & Machine Learning:** ScikitLearn, CLIPS, PyTorch, TensorFlow
- **Full-Stack:** HTML, CSS, Node.js, Express, MongoDB, Angular, React, SQL
- **Other Tools & Technologies:** Quantum Computing, Data structures and algorithms, OO Programming, Parallelism, Linear Algebra, Optimization

Honors and Awards

- **FPU Santander Scholarship** *2024*
  Banco Santander & UPC
  ◦ PhD Scholarship funded by Banco Santander and UPC
- **Nova 111 Student List** *2022*
  Nova Talent [🌐]
  ◦ One of the Top 10 CS students in Spain of 2022 by Nova Talent.
- **Best Bachelor's Thesis** *2021*
  Fib Alumni, UPC [🌐]
  ◦ Best Computer Science Bachelor's Thesis. Academic Year 2021/2022.
  ◦ Thesis Title: Spectral methods for graph drawing and synthesis of integrated circuits.
  ◦ Thesis Advisor: Jordi Cortadella.
- **Best High School's Thesis** *2018*
  Universitat Ramon Llull
  ◦ Best Chemistry Thesis.
- **Hackathons** *2019-2023*
  Participation in several Hackathons
  ◦ 1st position in Qiskit Hackathon 2023 and IBM's challenge winner.
  ◦ Floorfy challenge winners in HackUPC 2021.
  ◦ 1st position in StartUB 2021.
  ◦ 3rd position in Hack Kosice 2020.
  ◦ Everis challenge winners in Mamuthack 2019.
- **Academic Honors** *2017-2023*
  Bachelor's and Master's
  ◦ Bachelor's: Logic, Artifical Intelligence, Bachelor's Thesis.
  ◦ Master's: Quantum Computing and Information, Information Theory, Software Architecture, Master's Thesis.