

Dr. Davide Ferrari

CURRICULUM VITAE ET STUDIORUM

June 30, 2026

Tutto quanto dichiarato nel presente curriculum vitae corrisponde a verità ai sensi delle norme in materia di dichiarazioni sostitutive di cui agli artt. 46 e 47 del D.P.R. 28.12.2000 n. 445.

In fede

A handwritten signature in dark ink, appearing to read 'Davide Ferrari', written in a cursive style.

Personal Information

Name: Davide

Surname: Ferrari

Place and date of birth: Reggio nell'Emilia, 22/07/1992

Nationality: Italian

Place of residence: Piadena Drizzona

Telephone Numbers: +39 0521 906121 (office), +39 328 2161053 (personal)

E-mail: davide.ferrari1@unipr.it

Current Position

Postdoctoral Research Fellow, from February 2023, at the Quantum Software Laboratory (QSLab), Department of Engineering and Architecture - University of Parma, Italy. Recurring Visiting Researcher at QUTech, TU Delft, Netherlands.

Research Subjects: Quantum compiling strategies for distributed quantum computing architectures. Simulation and performance analysis of quantum network protocols and applications. Efficient quantum compiling for quantum simulation and quantum machine learning.

Past Positions

- *March 2025 – June 2025:* Visiting Reseracher at QUTech, TU Delft, Netherlands.
- *Novemembr 2019 – January 2023:* Ph.D student in Information Technologies at the Department of Engineering and Architecture - University of Parma, Italy.
- *February 2022 – December 2022:* Technical Consultant at Associazione Big Data for the strategic intervention program commissioned by the Emilia-Romagna region, "Quantum" sub-project.
- *April 2019 – July 2019:* Research Scholar at Future Technology Lab, University of Parma. Research Scholarship: "Design and Implementation of Efficient Algorithms and Software for Quantum Simulation"

- *May 2019*: Contracted Visitor at IBM Research Zurich. Internship: “Development of quantum algorithms for quantum chemistry calculations”

Awards

- *2020*: “IBMQ Awards: Circuit Optimization Developer Challenge” for the development of two compiler’s passes that could minimize noise and improve the performance of compiled quantum circuits, <https://www.ibm.com/blogs/research/2020/03/2019-ibmq-awards/>

Education

- *2019-2023*: Ph.D. in Information Technologies at the Department of Engineering and Architecture - University of Parma, Italy.
- *2016-2019*: Master’s Degree in Computer Engineering at the University of Parma, final grade 107/110. Thesis title: “Design and Implementation of Algorithms for Efficient Quantum Compiling”.
- *2011-2016*: Bachelor’s Degree in Computer Engineering at the Polytechnic of Milan with final grade 84/110.
- *2006-2011*: Scientific High School Diploma at Istituto di Istruzione Superiore G.Falcone with final grade 85/100.

Training

- *September 2021-April 2022*: edX online course titled “The Quantum Internet and Quantum Computers: How Will They Change the World?”, held by Delft University of Technology.
- *September-November 2021*: edX online course titled “Fundamentals of Quantum Information”, held by Delft University of Technology.
- *September-October 2021*: edX online course titled “The Hardware of a Quantum Computer”, held by Delft University of Technology.

- *October-December 2020*: edX online course titled “Architecture, Algorithms, and Protocols of a Quantum Computer and Quantum Internet”, held by Delft University of Technology.

Dr. Ferrari is a member of **IEEE** since 2019.

Research Activity

Dr. Ferrari is a member of the Distributed Systems Group and the Quantum Software Laboratory (QSLab) of the Department of Engineering and Architecture, University of Parma. The focus of his research activity is on:

- Distributed Quantum Computing
- Quantum Simulations
- Quantum Optimization
- Quantum Compilation
- Quantum Computing

Research results are documented by scientific publications and released open source code.

Participation in Research Projects

- *2023-Today*: “Quantum Internet Alliance” funded by the EU Flagship on Quantum Technologies (EU Horizon Europe) under Grant 101102140.
- *2021-2022*: “Technological Enablers for Preserving Data Integrity of Georeferenced and Position Information” funded by the European Space Agency (ESA), Contract No. 4000135821/21/NL/CRS/mkn. The goal of this project was to study and design an architecture for sharing and processing PNT information and/or georeferenced data for Location Based Services with privacy and integrity in untrusted environments, leveraging blockchain and secure computation.

Teaching Activity

Dr. Ferrari has carried out teaching assistance activities, from A.Y. 2019/2020 to A.Y. 2023/2024, in the context of the Master's degree course in Computer Engineering, at the University of Parma, for the "High Performance Computing" teaching course.

He carried out teaching activities in the course "Introduction to Quantum Computing" for Ph.D. students in Information Technologies, A.Y. 2024/2025. He also carried out teaching activities in the course "Quantum Internet Applications" for Ph.D. students in Information Technologies, A.Y. 2025/2026.

Dr. Ferrari is co-supervisor of the following degree thesis:

- Elia Candida, *Quantum Key Distribution: analisi e simulazioni dei protocolli BB84 ed E91*, Bachelor's Degree in Informatics, Electronics and Communication Engineering, 2024.
- Gabriele Incardona, *Design and Simulation of an Entanglement Routing Protocol*, Bachelor's Degree in Informatics, Electronics and Communication Engineering, 2024.
- Marta Ravazzoni, *Quantum Circuit Optimization for Minimizing Crosstalk in Quantum Multiprogramming*, Master's Degree in Computer Engineering, 2024.
- Federico Risoli, *A NetQASM Parser for Distributed Quantum Computing*, Bachelor's Degree in Informatics, Electronics and Communication Engineering, 2024.
- Felice D'Agruma, *Integrity and Privacy Preservation of Georeferenced Databases on Blockchain and Secure Computation*, Master's Degree in Computer Engineering, 2022.
- Saverio Nasturzio, *Software Tool for Mapping and Executing Distributed Quantum Computations on a Network Simulator*, Bachelor's Degree in Informatics, Electronics and Communication Engineering, 2021.

Invited Seminars

- *Quantum Algorithms: Implementation and Compilation*, invited seminar within the course “Quantum Information” for the Masters’s degree in “Ingegneria delle Telecomunicazioni” at Università degli Studi di Napoli Federico II, Napoli, 3 December 2020.

Oral Presentations at Conferences

- *Workshop on Distributed Quantum Computing Algorithms, Networks, Software, and Applications (WKS19) at QCE24*, where I presented the work “Execution Management of Distributed Quantum Computing Jobs”, Montréal, 18 September 2024, accepted talk.
- *2024 Workshop on High Performance and Quantum Computing Integration (HPQCI ’24)*, where I presented the work “A Design Framework for the Simulation of Distributed Quantum Computing”, Pisa, 3 June 2024, accepted talk. <https://dl.acm.org/doi/proceedings/10.1145/3659996>.
- *20th Italian Networking Workshop (INW 2024)*, where I presented the work “Distributed Quantum Computing Simulation with Realistic Network Models”, Madonna di Campiglio, 22 January 2024, accepted talk, <https://inw2024.disi.unitn.it/program/>.
- *European Quantum Technologies Conference (EQTC 2023)*, where I presented the work “A Modular Quantum Compilation Framework for Distributed Quantum Computing”, Hannover, 18 October 2023, accepted poster, <https://www.eqtc.eu/eqtc2023>.
- *15th Italian Quantum Information Science Conference (IQIS 2023)*, where I presented the work “A Simulation Framework for Distributed Quantum Computing”, Trieste, 21 September 2023, accepted poster, <https://iqis2023.it/program/>.
- *19th ACM International Conference on Computing Frontiers (CF’22)*, where I presented the work “Noise-Adaptive Quantum Compilation Strategies Evaluated with Application-Motivated Benchmarks”, Turin,

18 May 2022, accepted talk, <https://www.computingfrontiers.org/2022/index.html>.

- *QCrypt 2021*, where I presented the work “A Software Tool for Mapping and Executing Distributed Quantum Computations on a Network Simulator”, 24 August 2021, accepted poster, <https://2021.qcrypt.net/sessions/poster1/>.
- *6th Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC 2021)*, where I presented the work “Evaluating Noise-Adaptive Quantum Compiling Strategies with Application-Motivated Benchmarks”, 7 July 2021, accepted poster.
- *QC40: Physics of Computation*, where I presented the work “Compiler design for distributed quantum computing”, 6 May 2021, accepted talk, <https://qiskit.org/events/physics-of-computation/>.
- *XIII Workshop on Artificial Life and Evolutionary Computation (WIVACE 2018)*, where I presented the work “Demonstration of Envariance and Parity Learning on the IBM 16 Qubit Processor”, Parma, 11 September 2018, accepted talk, <https://wivace.org/2018/index2018.html>.

Workshops Organization

Dr. Ferrari was a PC member for the following workshops at international conferences:

- **1st International Workshop on High-Performance and Quantum Computing Integration (HPQCI24)**, *PC member and Main Chair*, co-located at the 33rd ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC24), Pisa, Italy, 2024.
- **2nd International Workshop on High-Performance and Quantum Computing Integration (HPQCI26)**, *PC member and Main Chair*, co-located at the 23rd ACM International Conference on Computing Frontiers (CF26), Catania, Italy, 2026.

- **IEEE Consumer Communications & Networking Conference (IEEE CCNC 2027)**, *PC member* of Track 12: Quantum Networking and Computing, Las Vegas, USA, 2027.
- **1st International Workshop on Quantum Computing and Networking for Smart Systems (QCNS 2026)**, *PC member*, co-located at the 12th IEEE International Conference on Smart Computing (IEEE SMARTCOMP 2026), Messina, Italy, 2026.
- **1st International Workshop on Distributed Quantum Computing and Quantum Internet Computing (DisQIC 2026)**, *PC member*, co-located at the 46th IEEE International Conference on Distributed Computing Systems (ICDCS 2026), Seoul, South Korea, 2026.

Conference Organization

- **IEEE 24th Consumer Communications & Networking Conference (CCNC2027)**, *PC member* of Track12: Quantum Networking and Computing, USA, NV, Las Vegas, 2027.

Peer Review Activity

Dr. Ferrari is a referee for the following international journals:

- **IEEE Transactions on Quantum Engineering (TQE)**, ed. IEEE.
- **IEEE Communications Letters**, ed. IEEE.
- **IEEE Network Magazine**, ed. IEEE.
- **IEEE Access**, ed. IEEE.
- **ACM Computing Surveys**, ed. ACM.
- **Quantum Information Processing**, ed. Springer.
- **IET Quantum Communication**, ed. Wiley.
- **IEEE Journal on Selected Areas in Communications**, ed. IEEE.
- **Future Generation Computer Systems**, ed. Elsevier.

Publications

All of the following publications have been peer reviewed.

International Journals

- (J5) M. Caleffi, M. Amoretti, D. Ferrari, J. Illiano, A. Manzalini, A.S. Cacciapuoti, *Distributed quantum computing: a survey*. Computer Networks, 254, Elsevier, December 2024.
- (J4) D. Ferrari, S. Carretta, M. Amoretti, *A Modular Quantum Compilation Framework for Distributed Quantum Computing*. IEEE Transactions on Quantum Engineering, 4, 1-13, IEEE, August 2023.
- (J3) D. Ferrari, I. Tavernelli, M. Amoretti, *Deterministic algorithms for compiling quantum circuits with recurrent patterns*. Quantum Information Processing, 20, 213, Springer, June 2021.
- (J2) D. Ferrari, A. S. Cacciapuoti, M. Amoretti, M. Caleffi, *Compiler Design for Distributed Quantum Computing*. IEEE Transactions on Quantum Engineering, vol. 2, pp. 1-20, Art no. 4100720, IEEE, January 2021.
- (J1) D. Ferrari, M. Amoretti, *Efficient and effective quantum compiling for entanglement-based machine learning on IBM Q devices*. International Journal of Quantum Information, vol. 16, no. 8, Art no. 1840006, World Scientific, November 2018.

Proceedings of International Conferences

- (C3) S. Bernheim, B. van der Vecht, D. Ferrari, D. Rivera and S. Wehner, *A Multi-Level Compiler Pipeline for Qoala Quantum Internet Programs*, accettato a IEEE International Conference on Quantum Software (QSW 2026), Sydney, Australia, 2026.
- (C2) A. Bertuzzi, D. Ferrari, A. Manzalini, M. Amoretti, *Evaluation of Quantum and Hybrid Solvers for Combinatorial Optimization*, in Proc. of the 21st ACM International Conference on Computing Frontiers (CF'24), Ischia, Italy, 2024.

- (C1) M. Amoretti, A. Budianu, G. Caparra, F. D’Agruma, D. Ferrari, G. Penzotti, L. Veltri, F. Zanichelli, *Enabling Location Based Services with Privacy and Integrity Protection in Untrusted Environments through Blockchain and Secure Computation*, in Proc. of the 4th IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications (IEEE TPS 2022), 2022.

Proceedings of International Workshops

- (W4) D. Ferrari, M. Bandini, M. Amoretti, *Execution Management of Distributed Quantum Computing Jobs*, in Proc. of the 2024 IEEE International Conference on Quantum Computing and Engineering (QCE), Distributed Quantum Computing Algorithms, Networks, Software, and Applications (WKS19), Montreal, Canada, 18 September 2024
- (W3) D. Ferrari, M. Amoretti, *A Design Framework for the Simulation of Distributed Quantum Computing*, in Proc. of the 33rd ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC2024), Workshop on High Performance and Quantum Computing Integration (HPQCI’24), Pisa, Italy, 3 June 2024
- (W2) M. Mordacci, D. Ferrari, M. Amoretti, *Multi-Class Quantum Convolutional Neural Networks*, in Proc. of the 33rd ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC2024), Quantum Search and Information Retrieval Workshop (QUASAR’24), Pisa, Italy, 3 June 2024
- (W1) D. Ferrari, M. Amoretti, *Noise-adaptive quantum compilation strategies evaluated with application-motivated benchmarks*, in the Proc. of the 19th ACM International Conference on Computing Frontiers (CF22), 1st Annual Compiler Frontiers Workshop, Turin, Italy, 18 May 2022.

Papers in Progress

- (A1) M. Bandini, D. Ferrari, S. Carretta, M. Amoretti, *Optimized Compilation for Distributed Quantum Computing*. arXiv:2602.24062, 2026.
- (A2) G. Ni and D. Ferrari and L. Ho and Michele Amoretti, *Advanced Scheduling Strategies for Distributed Quantum Computing Jobs*. arXiv:2602.24152, 2026.

Software released as open source

- DQC-NAC: a Noise Aware Compiler for Distributed Quantum Computing, <https://github.com/qslab-unipr/dqcnac>.
- Pattern-oriented Deterministic Quantum Compiler, <https://github.com/qis-unipr/padqc>.
- Noise Adaptive Quantum Compiler with IBM Qiskit, <https://github.com/qis-unipr/noise-adaptive-compiler>.

Software registered at SIAE

- Deterministic Pattern-Oriented Quantum Compiler (DPQC), <https://github.com/qis-unipr/padqc>.

Certificates

- Quantum 101: Quantum Computing & Quantum Internet, 2021.
- IBM Certified Associate Developer - Quantum Computation using Qiskit v0.2X, 2021, https://www.credly.com/badges/33fe8090-c894-41df-91ee-d4f6e2dd3959/public_url.
- IBM Quantum - Qiskit Advocate, 2020, https://www.credly.com/badges/d39391f8-f197-4f84-9de6-0d0933dae287/public_url.
- IBM Blockchain - Essentials, IBM, 2018, https://www.youracclaim.com/badges/e1c58727-ef65-4b22-8b0b-9e05a8907f8b/public_url.
- IBM Master the Mainframe - Advocate, IBM, 2017, https://www.youracclaim.com/badges/0f79305c-16dd-4d79-a8d3-a5bf910570d1/public_url.
- ECDL - European Computer Driving Licence, AICA, 2009, Licence IT-1651709.