Nicolò Dal Fabbro

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Appointments

Nov 2023 – present **Postdoc, University of Pennsylvania**, USA.
Advisor: George Pappas.
working on: *Communication-efficient federated and multi-agent reinforcement learning, with applications in marine robotics.*

Aug 2025 – present **Quantum and AI Fellow, Nasdaq Inc.**, USA
working on: *Communication-efficient multi-agent reinforcement learning for high-frequency trading.*

Education

2020 – 2023 **Ph.D., University of Padova**, Italy, Information and Communication Technology.
Advisors: Luca Schenato, Michele Rossi.
Dissertation: *Pushing the boundaries of federated learning: super-linear convergence and reinforcement learning over wireless.*

2018 – 2020 **M.Sc. University of Padova**, Italy, Telecommunications Engineering.
Thesis title: *WiFi-based human sensing.*

2015 – 2018 **B.Sc. University of Padova**, Italy, Information Engineering.

Awards and Honors

2024 **Best PhD thesis award** by the Italian telecommunications and information technology group (GTTI) for the year 2024: https://www.gtti.it/phd-awards/.

Penn AI fellowship, University of Pennsylvania AI postdoctoral fellowship (8K USD research fund): https://ai.upenn.edu/penn-ai-fellows

2023 **IEEE best dataset award**, winner of the Fall 2022 IEEE DataPort dataset upload contest in the machine learning category based on unique dataset views as measured by Google analytics and a review from a committee of IEEE volunteers for the dataset https://ieee-dataport.org/documents/csi-dataset-wireless-human-sensing-80-mhz-wi-fi-channels

2019 **Switzerland European mobility program** scholarship recipient for a master semester exchange at the *Ecòle Polytechnic Federal de Lausanne*, Switzerland.

Invited Talks

Dec 9, 2025 **SEA-CROGS, MMICCs center.** Seminar on learning-based environmental monitoring with marine robots. Title of talk: "Long-term mapping of the Douro river plume with multi-agent reinforcement learning".

Publications

Journal Articles

1. N. Dal Fabbro, A. Mitra, R. W. Heath, L. Schenato, and G. J. Pappas, "Finite-time analysis of over-the-air federated TD learning," *IEEE Transactions on Wireless Communications*, 2025.

2. A. Agiollo, E. Bardhi, M. Conti, N. Dal Fabbro, and R. Lazzeretti, "Anonymous federated learning via named-data networking," *Future Generation Computer Systems*, vol. 152, pp. 288–303, 2024.

3. L. Ballotta, N. Dal Fabbro, G. Perin, L. Schenato, M. Rossi, and G. Piro, "VREM-FL: Mobility-aware computation-scheduling co-design for vehicular federated learning," *IEEE Transactions on Vehicular Technology*, 2024.
4. N. Dal Fabbro, S. Dey, M. Rossi, and L. Schenato, "SHED: A Newton-type algorithm for federated learning based on incremental Hessian eigenvector sharing," *Automatica*, vol. 160, p. 111 460, 2024.
5. N. Dal Fabbro, A. Mitra, and G. J. Pappas, "Federated td learning over finite-rate erasure channels: Linear speedup under markovian sampling," *IEEE Control Systems Letters*, vol. 7, pp. 2461–2466, 2023.
6. F. Meneghello, N. Dal Fabbro, D. Garlisi, I. Tinnirello, and M. Rossi, "A CSI dataset for wireless human sensing on 80 MHz Wi-Fi channels," *IEEE Communications Magazine*, vol. 61, no. 9, pp. 146–152, 2023.
7. F. Meneghello, D. Garlisi, N. Dal Fabbro, I. Tinnirello, and M. Rossi, "SHARP: Environment and person independent activity recognition with commodity IEEE 802.11 access points," *IEEE Transactions on Mobile Computing*, vol. 22, no. 10, pp. 6160–6175, 2022.
8. N. Dal Fabbro, M. Rossi, G. Pillonetto, L. Schenato, and G. Piro, "Model-free radio map estimation in massive MIMO systems via semi-parametric Gaussian regression," *IEEE Wireless Communications Letters*, vol. 11, no. 3, pp. 473–477, 2021.

Conference Proceedings and Workshops

1. N. Dal Fabbro, M. Mesbahi, R. Mendes, J. B. de Sousa, and G. J. Pappas, "Long-term mapping of the Douro river plume with multi-agent reinforcement learning," in *IEEE International Conference on Robotics and Automation (ICRA), accepted, arXiv preprint arXiv:2510.03534*, 2026.
2. S. Noorani, O. Romero, N. Dal Fabbro, H. Hassani, and G. J. Pappas, "Conformal risk minimization with variance reduction," in *ICML 2025 Workshop on Reliable and Responsible Foundation Models*, 2025.
3. A. Adibi, N. Dal Fabbro, L. Schenato, *et al.*, "Stochastic approximation with delayed updates: finite-time rates under Markovian sampling," in *International Conference on Artificial Intelligence and Statistics*, 2024.
4. N. Dal Fabbro, A. Adibi, A. Mitra, and G. J. Pappas, "Finite-time analysis of asynchronous multi-agent TD learning," in *2024 American Control Conference (ACC)*, 2024.
5. N. Dal Fabbro, A. Adibi, H. V. Poor, S. R. Kulkarni, A. Mitra, and G. J. Pappas, "DASA: Delay-adaptive multi-agent stochastic approximation," in *IEEE 63rd Conference on Decision and Control (CDC)*, 2024.
6. N. Dal Fabbro, M. Rossi, L. Schenato, and S. Dey, "Q-SHED: Distributed optimization at the edge via hessian eigenvectors quantization," in *IEEE International Conference on Communications*, 2023.

Books and Chapters

1. N. Dal Fabbro, A. Mitra, and G. J. Pappas, "Communication-efficient federated reinforcement learning: recent advances and open challenges," in *Encyclopedia of systems and control*, Elsevier, 2024.

Teaching, mentoring and service

2024-current — **Research mentor**. Mentoring PhD and Master students at Penn.

2022 — **Teaching assistant**. *Numerical calculus*. University of Padova.
For first year undergraduate students of mechanical engineering.

Teaching, mentoring and service (continued)

2021-current — **Peer reviewer.** Automatica, IEEE Transactions on Mobile Computing, Sensors, IEEE Control Systems Letters, IEEE Transactions on Vehicular Technology, IEEE Systems Journal, IEEE Conference on Decision and Control, IEEE Transactions on Industrial Informatics, IEEE Transactions on Wireless Communications, International Conference on Learning for Decision and Control

References

available upon request