NICOLÒ DAL FABBRO

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https://ndf96.github.io
Venice, Italy

Ph.D. in Information and Communication Technology.
Currently a postdoctoral researcher at the University of Pennsylvania, USA.
My research interest and experience lie in the analysis and design of distributed machine learning algorithms and wireless sensing.

EDUCATION

PHD, INFORMATION AND COMMUNICATION TECHNOLOGY
Department of Information Engineering, University of Padova, Italy | October 2020 - October 2023

VISITING PHD STUDENT, GRASP (General Robotics, Automation, Sensing, and Perception)
Electrical and Systems Engineernig, University of Pennsylvania, USA | September 2022 - April 2023

M. S., TELECOMMUNICATIONS ENGINEERING
Department of Information Engineering, University of Padova, Italy | 2018 - 2020

EXCHANGE STUDENT, Swiss European Mobility Program (SEMP) (Scholarship Recipient)
École Polytechnique Fédérale de Lausanne (EPFL), School of Computer and Communication Sciences, Switzerland | 2019 - 2020

B. S. IN INFORMATION ENGINEERING
University of Padova, Italy | 2015 - 2018

WORK EXPERIENCE

POSTDOCTORAL RESEARCHER
Electrical and Systems Engineering, University of Pennsylvania, USA | November 2023 - ***Current***
- Conducting research in Federated Learning, Reinforcement Learning with applications to autonomous driving and smart agriculture.

UNIVERSITY RESEARCH ASSISTANT
University of Padova, Padova, Italy | September 2020 – September 2023
- Research on algorithm design for Federated Learning in the context of wireless 5G/6G networks, theoretical analysis of distributed and multi-agent reinforcement learning algorithms.

UNIVERSITY TEACHING ASSISTANT, Numerical Calculus
Department of Mathematics, University of Padova, Italy | February 2022 – July 2022
- Conducting practical sessions with excercises on numerical calculus in Matlab

RESEARCH INTERN, SIGNET RESEARCH GROUP, DEI
University of Padova, Italy | February 2020 - August 2020
- Experimental research on WiFi-based human sensing

SKILLS

Programming Languages and Software
Python | MATLAB | C++ | LaTeX | Linux | Github | Slack
Multilingual
Italian (native) | English (fluent) | French (basic)

AWARDS

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 the IEEE (https://ieee-dataport.org/documents/csi-dataset-wireless-human-sensing-80-mhz-wi-fi-channels)

PUBLICATIONS

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*, 2022, doi: 10.1109/LWC.2021.3132458

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,* 2024*,* doi: 10.1016/j.automatica.2023.111460

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*, 2022, doi: 10.1109/TMC.2022.3185681

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*, 2023, doi: 10.1109/MCOM.005.2200720

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*, 2023 doi: 10.1109/LCSYS.2023.3287499 (also accepted to be presented at *the 62nd IEEE Conference on Decision and Control (CDC 2023)*

N. Dal Fabbro, M. Rossi, L. Schenato, and S. Dey. **Q-SHED: Distributed Optimization at the Edge via Hessian Eigenvectors Quantization.** *IEEE International Conference on Communications* (*ICC*), Rome, Italy, 2023, doi: 10.1109/ICC45041.2023.10279510

N. Dal Fabbro, A. Mitra, R. W. Heath, L. Schenato, and G. J. Pappas. **Over-the-Air Federated TD Learning**. *Sixth Conference on Machine Learning and Systems (MLSys23)*, Workshop on Resource-Constrained Learning in Wireless Networks, Miami, Florida, 2023

Arman Adibi, Nicolò Dal Fabbro, Luca Schenato, Sanjeev Kulkarni, H. Vincent Poor, George J. Pappas, Hamed Hassani and Aritra Mitra. **Stochastic Approximation with Delayed Updates: Finite-Time Rates under Markovian Sampling**, Accepted for publication, *The 27th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024, preprint available: arXiv:2402.11800

Luca Ballotta, Nicolò Dal Fabbro, Giovanni Perin, Luca Schenato, Michele Rossi, Giuseppe Piro. **VREM-FL: Mobility-Aware Computation-Scheduling Co-Design for Vehicular Federated Learning**, under revision, *IEEE Transactions on Vehicular Technology*, 202x, preprint available arXiv:2311.18741

Andrea Agiollo, Enkeleda Bardhi, Mauro Conti, Nicolò Dal Fabbro, Riccardo Lazzeretti. **Anonymous Federated Learning via Named-Data Networking**, *Future Generation Computer Systems*, 2024, doi: 10.1016/j.future.2023.11.009

Nicolò Dal Fabbro, Arman Adibi, Aritra Mitra, George J. Pappas. **Finite-Time Analysis of Asynchronous Multi-Agent TD Learning**, Accepted for publication, *The 2024 American Control Conference (ACC)*, 2024

ADDITIONAL EXPERIENCE AND VOLUNTEERING

- Organizing weekly meetings between group members of my research group at the University of Pennsylvania. I have been organizing the meetings with the main objective of spurring collaboration, stimulating knowledge exchange and networking

- Attended and actively contributed to prestigious international PhD schools, including the IEEE/DEI Summer PhD School of Information Engineering "Silvano Pupolin" – SSIE 2022 (https://ssie.dei.unipd.it/), and the 5G International PhD School, December 2020 (https://www.5gitaly.eu/2020/)

- Reviewer for esteemed international journals, such as Signal Processing (Elsevier), Automatica (Elsevier), Transactions on Mobile Computing (IEEE), and Transactions on Vehicular Technology (IEEE) since 2021

- Co-founded and actively participated in Venice Calls (https://www.venicecalls.com/), a non-profit organization of social promotion in Venice. Helped coordinate volunteers during the 2019 flooding crisis, providing assistance to affected citizens, institutions, and businesses (https://www.festivalitaca.net/2020/02/venice-calls-gli-angeli-veneziani-dellacqua-alta/). Organized public events, including conferences and clean-up initiatives in the Venice Lagoon. Contributed to promoting public participation and cultural events.