NICOLÒ DAL FABBRO

Ph.D. student in Information and Communication Technology. My research interest and experience lie in federated learning, federated reinforcement learning, with a focus on wireless networks and wireless sensing.

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Venice, Italy

EDUCATION AND TRAINING

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

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

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* (under review), preprint arXiv:2202.05800, 2022

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* (to appear), 2023, preprint arXiv:2305.03170

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* (under review), preprint arXiv:2305.08104, 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*, to appear), Rome, Italy, 2023

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 (to appear), Miami, Florida, 2023

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

SKILLS

Research Skills
Federated Learning| Optimization algorithms | Wireless sensing and resource management
Programming Languages and Software
Python | Tensorflow | MATLAB | C++ | LaTeX | Linux | Google Suite | Slack | Microsoft Suite
Multilingual
Italian (native) | English (fluent) | French (basic)

WORK EXPERIENCE

UNIVERSITY RESEARCH ASSISTANT
University of Padova, Padova, Italy | September 2020 – Current

RESEARCH ASSOCIATE
Electrical and Systems Engineernig, University of Pennsylvania, USA | September 2022 - April 2023

UNIVERSITY TEACHING ASSISTANT, Numerical Calculus
Department of Mathematics, University of Padua | Padova, Italy | February 2022 – July 2022

RESEARCH INTERN, SIGNET RESEARCH GROUP, DEI
University of Padova | Padova, Italy | February 2020 - August 2020

- Experimental research on Wi-Fi-based human sensing

MORE TRAINING AND EXPERIENCE

- Presented the paper "SHED: A Newton-type algorithm for federated learning based on incremental Hessian eigenvector sharing" at the IFAC conference on Networked Systems (NecSys22), ETH, Zurich, 2022. Showcased through a poster presentation (https://necsys22.control.ee.ethz.ch/)

- Completed a short course on "Multi-agent convex optimization over asynchronous and lossy networks" at ETH Zurich, in collaboration with the NecSys22 conference on Networked Systems (https://necsys22.control.ee.ethz.ch/)

- 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

- Team leader during the "Space for your App" hackathon organized by ESA, GNS, and Unismart in Padova, 2018, where innovative solutions were developed, demonstrating leadership and problem-solving skills.