Bernardo Camajori Tedeschini

Telecommunication Engineer | PhD | Italian

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Residence : 20133, Milan, Italy Date of Birth : 14.01.1997, Carrara, Italy

Academics

November 2024 – November 2021 — PhD in Information Technology (Honors - Cum Laude), Telecommunications, Politecnico di Milano
- Thesis : Cooperative Machine Learning Methods in Distributed Systems.
- Multi-agent Learning.
- Online Learning and Monitoring.
- TinyML and Efficient Deep Learning Computing.

October 2021 – October 2019 — Master Degree in Telecommunication Engineering (Honors - 110L, GPA 29.85/30), Communication Networks and Internet, Politecnico di Milano
- Thesis in collaboration with CERN, CNR, and medical school of Athens.
  Title : "Federated learning architectures and algorithms for diagnostic imaging in healthcare networks."

July 2019 – October 2016 — Bachelor Degree in Computer Science Engineering (Honors - 110L, GPA 29.23/30), Telecommunications, Politecnico di Milano
- Thesis : Final Examination in Communication Systems.

Honors and Awards

2024 PhD degree with Honors.
2022 Roberto Rocca Doctoral Fellowship : funding for 12 months of research at MIT.
2021 PhD grant from Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR), Italy.
2021 Master's degree with Honors.
2019 Bachelor's degree with Honors.
2017 Best freshmen of the academic year 2016/2017.

Work experience, stages, studies abroad

Today – February 2025 — Senior Systems Engineer, Qualcomm Inc., France
- Wireless R&D, 6G NTN.

August 2024 – August 2023 — Visiting Researcher at MIT Laboratory for Information & Decision Systems (LIDS), Massachusetts Institute of Technology, Cambridge
- Contribution : Development of classical and deep machine learning algorithms for localization and sensing networks. Research carried out under Prof. Win's supervision.

Bayesian Neural Networks | Ray-tracing | 5G | Autonomous Vehicles

July 2021 – June 2021 — Visiting Research Scientist, CERN, Geneva
- Contribution : Implementing and testing the network architecture for the Federated Learning in real and physically separated machines located at CERN, Milan, and Athens.

Federated Learning | MQTT | NVIDIA | Docker

July 2013 – June 2013 — Summer english school, University of Limerick, Ireland
- Contribution : Attending daily lessons of english and culture of Ireland.

PhD Projects

TRUSTroke 2022 - 2025

trustroke.eu

- Partners : Fundacio Hospital Universitari Vall D'Hebron, Fondazione Policlinico Universitario Agostino Gemelli-IRCSS, KU Leuven, CERN, Eurecat Technology Centre, Nora Health, Politecnico di Milano, CNR, Stroke Alliance for Europe and others.
- Objective : Trustworthy prediction of stroke outcome on a Federated Learning infrastructure.
- Budget : 6M €. Call : HORIZON-HLTH-2022-STAYHLTH-01-two-stage.
- Contribution : Analysis of the federated algorithms and their optimization.

Tensorflow | Fully-distributed Federated Learning | Asynchronous Federated Learning

HYPER-5G 2022 - 2024

hyper5g-project.eu

- Partners : Geomatics Research & Development srl, algoWatt SpA and Politecnico di Milano.
- Budget : 500k € funded by ESA's Navigation Innovation and Support Program (NAVISP).
- Objective : Studying, designing and developing the algorithms and software needed to implement a precise positioning engine to jointly use multi-constellation GNSS and 5G observations.
- Contribution : Design and implement the 5G positioning system.

Matlab | Rohde & Schwarz scanner

CAFEIN-FL 2019 - 2021

kt.cern/kt-fund/projects/cafein-federated-network-platform-development-and-deployment-ai-based-analysis-and

- Partners : CERN, CNR, Politecnico di Milano, National and Kapodistrian University of Athens.
- Budget : 135k CHF funded by CERN Knowledge Transfer fund.
- Objective : Federated network platform for the development and deployment of AI based analysis and prediction models.
- Contribution : Creation of the whole network architecture and proof-of-work implementation of Federated Learning algorithms.

Tensorflow | Personalized Federated Learning

Certifications

February 2025	Qualcomm Technologies 5G Associate-Level Certification
October 2022	Professional engineering license
July 2022	MIT Certification of English Proficiency Assessment
November 2021	TOEFL
October 2021	RTF Certificate (VHF)
August 2021	First Aid Certificate
September 2018	ETS - TOEIC (Test of English for International Communication - Listening and Reading Test), Grade 835 (C1)
May 2015	Certificate in ESOL International (First), Grade C

Technical Skills

Programming Languages	Python (Advanced) Matlab (Advanced) C/C++ (Beginner)
Deep Learning Frameworks	PyTorch, TensorFlow, Keras
SDK's	Visual Studio Code, Eclipse, git
Operating Systems	Mac OS, Windows, Linux
Database Tools	MySQL
Text Processing	Word, PowerPoint

Interests

- Machine Learning
- Localization
- Vehicles
- Data Mining
- Wireless Communications

Languages

Italian	●●●●●
English	●●●●●
French	●●●○○

Soft Skills

- Problem Solving
- Team Working
- Leadership
- Curiosity and innovation
- Organization and planning

References

Monica Barbara Nicoli
Associate Professor at Polimi
Milan, Italy
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Luigi Serio
High-ranking official at CERN
Geneva, Switzerland
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Moe Z. Win
Core faculty Professor at MIT
Cambridge, MA, USA
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Publications

Jan 2025 **B. Camajori Tedeschini**, S. Savazzi, M. Nicoli, "Weighted Consensus Algorithms in Distributed and Federated Learning", IEEE Transactions on Network Science and Engineering (TNSE), doi : 10.1109/TNSE.2025.3528982.

Nov 2024 M. Brambilla, M. Alghisi, **B. Camajori Tedeschini**, A. Fumagalli, F. Grec, L. Italiano, C. Pileggi, L. Biagi, S. Bianchi, A. Gatti, A. Goia, M. Nicoli, and E. Realini, "Integration of 5G and GNSS Technologies for Enhanced Positioning : an Experimental Study", IEEE Open Journal of the Communications Society (OJ-COMS), doi : 10.1109/OJCOMS.2024.3487270.

Nov 2024 J. C. Morrison, N. Schatz, S. Kim, G. Kwon, **B. Camajori Tedeschini**, V. Weerackody, A. Conti, and M. Z. Win, "Sidelink-Enabled Cooperative Localization for xG Non-Terrestrial Networks", IEEE Military Communications Conference (MILCOM), pp. 1-6, doi : 10.1109/MILCOM61039.2024.10773683.

Nov 2024 N. Schatz, S. Kim, G. Kwon, **B. Camajori Tedeschini**, M. Ricard, T. Klein, V. Weerackody, A. Conti, and M. Z. Win, "Location Verification in Next-Generation Non-Terrestrial Networks", IEEE Military Communications Conference (MILCOM), pp. 1-6, doi : 10.1109/MILCOM61039.2024.10774026.

Oct 2024 **B. Camajori Tedeschini**, M. Brambilla, M. Nicoli, and M. Z. Win, "Multi-agent Reinforcement Learning for Distributed Cooperative Positioning", IEEE Transactions on Intelligent Vehicles (TIV), doi : 10.1109/TIV.2024.3471909.

Sep 2024 L. Italiano, **B. Camajori Tedeschini**, M. Brambilla, H. Huang, M. Nicoli and H. Wymeersch, "A Tutorial on 5G Positioning", IEEE Communications Surveys & Tutorials (COMST), doi : 10.1109/COMST.2024.3449031.

Sep 2024 **B. Camajori Tedeschini**, G. Kwon, M. Nicoli, and M. Z. Win, "Real-time Bayesian Neural Networks for 6G Cooperative Positioning and Tracking", IEEE Journal on Selected Areas in Communications (JSAC), special issue "Positioning and Sensing Over Wireless Networks", doi : 10.1109/JSAC.2024.3413950.

Aug 2024 **B. Camajori Tedeschini**, M. Brambilla and M. Nicoli, "Split Consensus Federated Learning : an Approach for Distributed Training and Inference", IEEE Access, doi : 10.1109/ACCESS.2024.3446577.

Jul 2024 **B. Camajori Tedeschini**, M. Brambilla, M. Nicoli, and M. Z. Win, "Cooperative Positioning with Multi-Agent Reinforcement Learning", 27th IEEE International Conference on Information Fusion (FUSION), doi : 10.23919/FUSION59988.2024.10706524.

Jun 2024 L. Italiano, **B. Camajori Tedeschini**, M. Brambilla and M. Nicoli, "Pedestrian Positioning in Urban Environments with 5G Technology", IEEE 22th Mediterranean Communication and Computer Networking Conference (MedComNet), doi : 10.1109/MedComNet62012.2024.10578126.

Jun 2024 U. Milasheuski, L. Barbieri, **B. Camajori Tedeschini**, M. Nicoli, and S. Savazzi, "On the Impact of Data Heterogeneity in Federated Learning Environments with Application to Healthcare Networks", IEEE Conference on Artificial Intelligence, pp. 1-6, doi : 10.1109/CAI59869.2024.00185.

Jun 2024 **B. Camajori Tedeschini**, G. Kwon, M. Nicoli, and M. Z. Win, "Empowering 6G Positioning and Tracking with Bayesian Neural Networks", IEEE International Conference on Communications (ICC), pp. 1-7, doi : 10.1109/ICC51166.2024.10622691.

Mar 2024 L. Barbieri, **B. Camajori Tedeschini**, M. Brambilla and M. Nicoli, "Deep Learning-based Cooperative LiDAR Sensing for Improved Vehicle Positioning", IEEE Transactions on Signal Processing (TSP), doi : 10.1109/TSP.2024.3377375.

Nov 2023 S. Roger, M. Brambilla, **B. Camajori Tedeschini**, C. Botella-Mascarell, M. Cobos and M. Nicoli, "Deep-Learning-Based Radio Map Reconstruction for V2X Communications", IEEE Transactions on Vehicular Technology (TVT), doi : 10.1109/TVT.2023.3326935.

Sep 2023 **B. Camajori Tedeschini**, M. Brambilla, L. Italiano, S. Reggiani, D. Vaccarono, M. Alghisi, L. Benvenuto, A. Goia, E. Realini, F. Grec and M. Nicoli, "5G positioning : a feasibility analysis with current network deployment", Scientific Reports (Nature), doi : 10.1038/s41598-023-42426-1.

Sep 2023 **B. Camajori Tedeschini** and M. Nicoli, "Cooperative Deep-Learning Positioning in mmWave 5G-Advanced Networks", IEEE Journal on Selected Areas in Communications (JSAC), special issue "5G/6G Precise Positioning on Cooperative Intelligent Transportation Systems (C-ITS) and Connected Automated Vehicles (CAV)", doi : 10.1109/JSAC.2023.3322795.

Aug 2023 **B. Camajori Tedeschini**, M. Brambilla and M. Nicoli, "Message Passing Neural Network Versus Message Passing Algorithm for Cooperative Positioning", IEEE Transactions on Cognitive Communications and Networking (TCCN), doi : 10.1109/TCCN.2023.3307953.

Aug 2023 **B. Camajori Tedeschini**, M. Brambilla, L. Barbieri, G. Balducci and M. Nicoli, "Cooperative lidar sensing for pedestrian detection : data association based on message passing neural networks", IEEE Transactions on Signal Processing (TSP), doi : 10.1109/TSP.2023.3304002.

Jun 2023 L. Barbieri, **B. Camajori Tedeschini**, M. Brambilla and M. Nicoli, "Implicit vehicle positioning with cooperative lidar sensing", 48th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 1-5, doi : 10.1109/ICASSP49357.2023.10094864.

Publications

May 2023 **B. Camajori Tedeschini**, M. Nicoli and M. Z. Win, "On the Latent Space of mmWave MIMO Channels for NLOS Identification in 5G-Advanced Systems", IEEE Journal on Selected Areas in Communications (JSAC), special issue "3GPP Technologies : 5G-Advanced and Beyond", doi : 10.1109/JSAC.2023.3273769.

May 2023 **B. Camajori Tedeschini**, S. Savazzi, M. Nicoli, "A Traffic Model based Approach to Parameter Server Design in Federated Learning Processes", IEEE Communications Letters (COMML), doi : 10.1109/LCOMM.2023.3272844.

Jul 2022 **B. Camajori Tedeschini**, M. Brambilla, L. Barbieri and M. Nicoli, "Addressing data association by message passing over graph neural networks", 25th IEEE International Conference on Information Fusion (FUSION), pp. 01-07, doi : 10.23919/FUSION49751.2022.9841233.

Jan 2022 **B. Camajori Tedeschini**, S. Savazzi, R. Stoklasa, L. Barbieri, I. Stathopoulos, M. Nicoli, L. Serio, "Decentralized Federated Learning for Healthcare Networks : A Case Study on Tumor Segmentation", IEEE Access, doi : 10.1109/ACCESS.2022.3141913.