Fabrizio Carpi

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Education

New York University — *Brooklyn, NY*
PhD in Electrical Engineering — *Expected graduation: 05/2024*
- Research focus: information theory, task-aware compression, machine learning applications to telecommunications.
- Advisors: Prof. Elza Erkip and Prof. Siddharth Garg. Courses: Machine Learning, Information Th., Statistical Learning Th., Digital Signal Processing.

University of Parma — *Parma, Italy*
MS in Communication Engineering — *10/2018*
- Graduated *summa cum laude*. Thesis: "Exploring Machine Learning Algorithms for Decoding Linear Block Codes."

BS in Information Engineering — *12/2015*

Experience

Nokia Bell Labs — *Murray Hill, NJ*
Communication Systems Intern — *06/2022 - 08/2022*
- Project: semantic communications for CSI feedback in Massive MIMO.

Intel — Next Generation and Standards group — *Remote*
Wireless Standards Research Intern — *05/2021 - 08/2021*
- Developed use cases for pre-standard 6G, focusing on AI applications. Project: AI-assisted CSI feedback for MIMO.
- Generated data (Matlab 5G toolbox), implemented autoencoder-based simulations (Python), and periodically presented results to the AI-related group.

New York University — Tandon School of Engineering — NYU Wireless — *Brooklyn, NY*
Graduate Research Assistant — *09/2019 - Present*
- Working on projects at the intersection between machine learning and communications within the NYU Wireless research center.
- Conduct research about task-aware compression in networks with constrained nodes (Matlab, Python, Tensorflow, Pytorch).

Teaching Assistant — ECE 2233, Introduction to Probability — *09/2020 - 12/2020*
- Lead exercise sessions, held office hours, and prepared video tutorials for students.

University of Parma — Internet of Things (IoT) Lab — *Parma, Italy*
Research Associate — *11/2018 - 08/2019*
- Developed methods to detect LoS transmissions and to improve localization of mobile devices in indoor and outdoor settings.
- Organized research meetings, collected measurements (WiFi/4G), implemented simulations (Matlab), and drafted technical papers and reports.

Duke University — Information Initiative at Duke (IID) — *Durham, NC*
Visiting Student for MS thesis — *03/2018 - 08/2018*
- Optimized belief propagation decoding with supervised learning and investigated the impact of different loss functions for channel coding.
- Proposed a new reinforcement learning-based approach for the decoding of linear block codes (Python, Tensorflow).

Awards

2022 **Dante Youla Award**, Graduate Research Excellence in Electrical Engineering at NYU Tandon.
2021 **Best Student Paper Award (2nd place)**, IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC).
2021 **Best Poster Award (1st place)**, IEEE Communication Theory Workshop (CTW).
2021 **David and Cecilia Chang Education Award**, Excellence in Teaching Assistantship in the ECE department at NYU Tandon.

Leadership

- **NYU Tandon Graduate Admissions**, *Ambassador* representing NYU Tandon graduate programs with prospective students. — *02/2020 - Present*
- **Electrical and Computer Eng. PhD Students Organization (NYU Tandon)**, *Organizer* for peer-support and networking events. — *09/2021 - Present*
- **Italian Scientists & Scholars in North America Foundation (ISSNAF)**, *Mentee* within the ISSNAF network. — *01/2022 - Present*
- **LeadTheFuture**, *Mentee* within the LTF network, an Italian leading non-profit organization for people in STEM (acceptance <20%). — *09/2020 - 09/2021*

Publications

1. F. Carpi, S. Garg, E. Erkip, *"Single-Shot Compression for Hypothesis Testing,"* IEEE SPAWC 2021 + poster at IEEE CTW and ITR3 @ ICML.
2. F. Carpi, C. Häger, M. Martalò, R. Raheli, H. Pfister, *"Reinforcement Learning for Channel Coding: Learned Bit-Flipping Decoding,"* ALLERTON 2019.
3. M. Lian, F. Carpi, C. Häger, H. D. Pfister, *"Learned Belief-Propagation Decoding with Simple Scaling and SNR Adaptation,"* IEEE ISIT 2019.
4. F. Carpi, L. Davoli, M. Martalò, A. Cilfone, Y. Yu, Y. Wang, G. Ferrari, *"RSSI-based Methods for LOS/NLOS Channel Identification in Indoor Scenarios,"* ISWCS 2019.