Federico Brunero

PhD Graduate in Communication Systems

me@federicobrunero.com
+33 (0)6 85 89 68 78
linkedin.com/in/federicobrunero
federicobrunero.com

Professional Summary

Extremely determined and highly ambitious recent **PhD graduate** with strong mathematical background. Eager to learn and dive deep into problems to have a crystal-clear understanding of how things work. Highly organized hard worker who is keen on collaboratively working within a team of international researchers and engineers. Standing out for dedication, meticulousness and critical thinking. Exceedingly interested in **wireless communication systems** and **machine learning**, in addition to **information theory**, **coding theory** and **combinatorics**. Currently looking for a **research engineer** position in wireless systems with strong focus on practical implementation of PoCs.

Work Experience

Research Assistant
July 2019 – December 2022

EURECOM, Sophia Antipolis, France

- Research conducted under the supervision of Prof. Petros Elia and supported by the European Research Council (ERC) through the EU Horizon 2020 Research and Innovation Program under Grant 725939 (Project DUALITY).
- Teaching assistant for the course **Information Theory** (2021), for the semester project **6G Communications for Virtual Reality Networks** (2022).

MATLAB Student Ambassador
October 2017 – July 2018

The MathWorks srl, Torino, Italy

- Managed a community of students at the Politecnico di Torino through a Facebook group.
- Organized seminars about the MATLAB software and its toolboxes with focus on image processing applications and linear algebra.

Software Developer
March 2017 – June 2017

VEM Solutions S.r.l., Venaria Reale, Italy

- Analyzed and interpreted data from accelerometers. Data processing software developed in `C#`.
- Exploited digital filters to make statistical analysis on the data extracted with the developed software.

Education

PhD in Computer Science, Telecommunications and Electronics
December 2022

Sorbonne Université, France

Thesis title Unearthing the Impact of Structure in Data and in Topology for Caching and Computing Networks
Advisor Petros Elia
Description Improved and deepened the understanding of the key role that structure plays either in data or in topology for caching and computing networks. First, explored the fundamental limits of caching under some information-theoretic models that impose structure in data; then, investigated the impressive ramifications of having structure in network topology. Results extended to the distributed computing setting.

Master of Science in Data Science and Engineering
January 2021

Institut Mines-Télécom and EURECOM, France
GPA: 4.0/4.0

Master of Science in Electrical and Computer Engineering
August 2019

University of Illinois Chicago, US
GPA: 4.0/4.0

Thesis title Low-Density Parity-Check Code Design for the AWGN Channel with Additive Radar Interference
Advisor Natasha Devroye (co-advisor in Italy) **Co-advisors** Daniela Tuninetti, Roberto Garello (advisor in Italy)
Description Performance analysis of convolutional codes in the AWGN channel with Additive Radar Interference and in-depth study of LDPC codes applied to the same channel model, with final LDPC code design and comparison to LDPC codes optimized for the AWGN channel.

Master's Degree in Communications and Computer Networks Engineering
July 2019

Politecnico di Torino, Italy
Grade: 110/110 Summa Cum Laude (highest grade)

The thesis work was the same as the one conducted in the US since it was related to the joint project TOP-UIC between the Politecnico di Torino and the University of Illinois Chicago.

Bachelor's Degree in Telecommunications Engineering
July 2017

Politecnico di Torino, Italy
Grade: 110/110

Federico Brunero

PhD Graduate in Communication Systems

me@federicobrunero.com
+33 (0)6 85 89 68 78
linkedin.com/in/federicobrunero
federicobrunero.com

Skills

Software/frameworks ANSYS HFSS, AWS, Code::Blocks, GNU Emacs, JupyterLab, MS Office, Visual Studio, Wireshark
Programming and markup languages `Bash`, `C`, `C#`, `JavaScript`, LaTeX, `Markdown`, `MATLAB`, `Python`
Languages fluent in English, native Italian

Publications

Submitted

[S1] **F. Brunero** and P. Elia, "Multi-access distributed computing," *IEEE Transactions on Information Theory*, Jun. 2022, arXiv: 2206.12851 [cs.IT], submitted.

Journals

[J1] **F. Brunero** and P. Elia, "Fundamental limits of combinatorial multi-access caching," *IEEE Transactions on Information Theory*, Jul. 2022, early access. doi: 10/jbgr, pre-published.

[J2] **F. Brunero** and P. Elia, "Unselfish coded caching can yield unbounded gains over selfish caching," *IEEE Transactions on Information Theory*, vol. 68, no. 12, pp. 7871–7891, Dec. 2022.

Conferences

[C1] **F. Brunero** and P. Elia, "Coded caching does not generally benefit from selfish caching," in *2022 IEEE International Symposium on Information Theory (ISIT)*, Jun. 2022, pp. 1139–1144.

[C2] **F. Brunero** and P. Elia, "On the optimality of coded caching with heterogeneous user profiles," in *2022 IEEE Information Theory Workshop (ITW)*, Nov. 2022, pp. 166–171.

[C3] **F. Brunero** and P. Elia, "The exact load-memory tradeoff of multi-access coded caching with combinatorial topology," in *2022 IEEE International Symposium on Infofrmation Theory (ISIT)*, Jun. 2022, pp. 1701–1706.

[C4] **F. Brunero**, D. Tuninetti, and N. Devroye, "On code design for wireless channels with additive radar interference," in *2019 IEEE Information Theory Workshop (ITW)*, Aug. 2019, pp. 1–5.