

## PROFESSIONAL SUMMARY

Extremely determined and highly ambitious engineer with strong background in mathematics and programming. 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 **software development**, **signal processing** and **wireless systems** in addition to **machine learning**, **information theory**, **coding theory** and **combinatorics**.

## WORK EXPERIENCE

### SENIOR RESEARCH ENGINEER

June 2023 – Current

*Huawei, Munich, Germany*

- Focus on coherent optical communications, and low-power and low-complexity implementation of DSP algorithms.
- Responsible for the development of simulation platforms in Python to test and validate PoCs.
- Contribution to standardization of future long-reach optical communications within the OIF forum.

### RESEARCH ASSISTANT

July 2019 – December 2022

*EURECOM, Sophia Antipolis, France*

- In-depth study of combinatorial and information-theoretic aspects of caching and computing networks. Explored the key role played by structure either in data or in topology for memory-aided communication networks.
- Designed efficient algorithms for highly combinatorial caching and distributed computing settings. Developed mathematical proofs based on information-theoretic arguments to establish the optimal performance.
- 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*

- Organized talks and seminars about MATLAB and its toolboxes with focus on image processing applications and linear algebra.
- Organized MATLAB/Simulink demo sessions on real-time object detection, inverted pendulum project and FM broadcast receiver.

### SOFTWARE DEVELOPER

March 2017 – June 2017

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

- Analyzed car accidents data from accelerometers. Developed in C# a data analysis software to process the input data structures.
- Exploited digital filters to make statistical analysis on the extracted data. Determined empirical thresholds on acceleration and jerk to establish accident events.

## 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

### 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 Garelli (advisor in Italy)

### MASTER'S DEGREE IN COMMUNICATIONS AND COMPUTER NETWORKS ENGINEERING

July 2019

*Politecnico di Torino, Italy*

*Grade: 110/110 Summa Cum Laude (highest grade)*

### BACHELOR'S DEGREE IN TELECOMMUNICATIONS ENGINEERING

July 2017

*Politecnico di Torino, Italy*

*Grade: 110/110*

## SKILLS

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

## PUBLICATIONS

### Journals

- [J1] **F. Brunero** and P. Elia, “Multi-access distributed computing,” *IEEE Transactions on Information Theory*, vol. 70, no. 5, pp. 3385–3398, May 2024.
- [J2] **F. Brunero** and P. Elia, “Fundamental limits of combinatorial multi-access caching,” *IEEE Transactions on Information Theory*, vol. 69, no. 2, pp. 1037–1056, Feb. 2023.
- [J3] **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 Information 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.