

# Gabriele Berton

## PhD Candidate in Computer Vision

 [Google Scholar](#)

 [GitHub](#)

 [Personal Website](#)

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### PROFILE

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- TLDR: PhD in Computer Vision from CMU and PoliTo with **6 first-author CVPR and ICCV papers, 1000 GitHub stars**, industry and research experience.
- I come up with innovative solutions to simultaneously **solve real-world problems** and publish at the world's top conferences.
- My focus is on visual place recognition and large-scale image retrieval, and I have worked in representation learning, image matching, object detection, video action segmentation, large-scale classification, data collection and remote sensing.

### EDUCATION & EMPLOYMENT

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Visiting PhD Student | **Carnegie Mellon University** | Mar 2024 – Jul 2024

- Working on learned RGB SLAM with 3D gaussians, to be deployed on a drone.

PhD Student | Polytechnic of Turin | Nov 2021 – Nov 2024

- Created EarthLoc (CVPR 2024), a model for Astronaut Photography Localization, currently used at NASA. EarthLoc provides a **10x speed up** and **increases accuracy by 21%** to NASA's previous model.
- First author of CosPlace (CVPR 2022), a Visual Place Recognition model that achieved SOTA with **8x smaller descriptor, 75% less VRAM**, same training time and 1000x more scalability than previous SOTA.
- Developed a large-scale (**over  $10^9$  images**) retrieval software for Visual Place Recognition
- Co-supervised 8 master students
- Teaching assistant of "Machine Learning and Deep Learning" and "Algorithms and Programming"

Applied Scientist Intern | **Amazon** Berlin | May 2022 - Sep 2022

- Worked on an action spotting pipeline in videos through multi-modal neural networks
- Analyzing video understanding and audio processing methods for a real-world application

Applied Scientist | Italian Institute of Technology & Polytechnic of Turin | Apr 2020 – Oct 2021

Software Engineer | Consoft Sistemi | Dec 2017 – Dec 2018

### INVITED TALKS (~1 HOUR)

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- Jan 2024 - Talk on Applications and Challenges of Visual Geo-localization, Visual Recognition Group at the Czech Technical University, Czechia
- Jul 2023 - Talk on Scalable Visual Geo-localization, Pattern Analysis and Computer Vision group at the Italian Institute of Technology, Italy
- Jun 2023 - Talk on Recent Image Geo-localization Benchmark and Large-scale Real-world Scenarios, **CVPR Tutorial** on A Comprehensive Tour and Recent Advancements toward Real-world Visual Geo-Localization, Canada
- Jun 2023 - Machine Learning Genoa Center, University of Genoa, Italy

### AWARDS

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- May 2024 - Awarded with Blanceflor Foundation Fellowship (30.000 SEK)
- Aug 2023 - Awarded with ESA Nor sponsorship (3.000 €)
- Jul 2023 - Best Student Research Award in the Video&Poster Competition at EuroCon 2023 (500 €)

## SELECTED PUBLICATIONS (FIRST AUTHOR AT TOP CONFERENCES)

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- **CVPR 2024** - EarthLoc: Astronaut Photography Localization by Indexing Earth from Space  
G. Berton, A. Stoken, B. Caputo, C. Masone
- **RAL/ICRA 2024** - JIST: Joint Image and Sequence Training for Sequential Visual Place Recognition  
G. Berton\*, G. Trivigno\*, B. Caputo, C. Masone
- **ICCV 2023** - EigenPlaces: Training Viewpoint Robust Models for Visual Place Recognition  
G. Berton\*, G. Trivigno\*, C. Masone, Juan Aragon, B. Caputo
- **ICCV 2023** - Divide&Classify: Fine-Grained Classification for City-Wide Visual Geo-localization  
G. Trivigno\*, G. Berton\*, C. Masone, B. Caputo
- **CVPR 2022 (Oral)** - Deep Visual Geo-localization Benchmark  
G. Berton, R. Mereu, G. Trivigno, C. Masone, G. Csurka, T. Sattler, B. Caputo
- **CVPR 2022** - Rethinking Visual Geo-localization for Large-Scale Applications  
G. Berton, C. Masone, B. Caputo
- **ICCV 2021** - Viewpoint Invariant Dense Matching for Visual Geolocalization  
G. Berton, C. Masone, V. Paolicelli, B. Caputo

## OTHER EXPERIENCES AND SKILLS

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- I was part of RoboTo, a university team with which I take part at international robotics competitions, through which I've learn to **integrate computer vision methods into robots**.
- I'm a **math-oriented** person: in my youth I won numerous math competitions, and in high school I reached the finals of the Italian National Olympics of Mathematics both individually and with my high school team.
- I'm an avid traveler (been to 40+ countries): I spent one year of high school in China through AFS, after which I took a gap year, working **six months in Australian plantations** and then traveling from Thailand to Italy without flights. These adventures gave me confidence, curiosity and self-motivation.
- I played football for more than 15 years, and have been a football referee for three years, during which I've learned to **autonomously take quick decisions under pressure**.
- I managed the rental of a summer holiday home for three years in my hometown, on AirBnb and Booking. I have thus learned the basics of **entrepreneurship** and dealing with customers.
- During my last year of high school I was elected as one of four student government presidents. During this year, I had the chance to practice my **leadership** and **public speaking** skills.
- After volunteering as an English teacher at the Fantasy Camp in Belarus in 2016, I became their HR recruiter, and I was in charge of recruiting 60 international English teachers for the summer. I conducted hundreds of interviews, and I assisted the candidates with travel and visa requirements. This experience improved my **organizational** and **scheduling** skills.