Curriculum vitae

Guglielmo Camporese

(gool-yell-moe)

last update: May, 2026

Personal

Birth Camposampiero (PD), Italy, on March 8^{th} 1993. Italian citizen. Male.

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Work Experience

2024 - Present **AI Researcher**
Disney Research - Zürich, Switzerland

- **Disney+ RecSys.** Building from scratch the new recommender system of Disney+ (semantic tokenization of Disney+ content with RVQ-VAEs, training GPT-style models over quantized semantic tokens).
- **Speech Search.** Built a real-time speech LLM to search content on the Disney+ catalog, using natural language, exploiting function calls, and RAG.
- **AI Characters.** Building LLM guardrails for real-time speech-to-speech conversations with LLM-based AI Characters (fine-tuning small guardrail LMs on synthetic data for specific AI characters).
- **Video Inpainting.** Worked on high-resolution video inpainting, video object removal, and open-vocabulary multi-modal segmentation.
- **AI Dubbing.** Created from scratch an AI dubbing and subbing pipeline for videos (voice cloning, text-to-speech, speech-to-speech, subtitles translation with LLMs).

○ **Filed 7 patents.**

2022 - 2023 **AI Independent Researcher & Engineer**
Italy

- **Gucci + Salesspeed AI.** Worked on visual anomaly detection for identifying defects in raw materials used for Gucci products. Specifically, worked on the implementation from scratch, training, and evaluation of the model for anomaly segmentation and detection.
- **Dronus.** Implemented a multi-object tracking system for drones with the aim of identifying objects in industrial settings. Specifically, worked on the model design and training, synthetic data generation, and model evaluation.

04-07/2023 **Researcher**
Disney Research - Zürich, Switzerland - Internship

Worked on model optimization, transfer learning and knowledge distillation. Developed a new neural network activation that improves accuracy in different domains, such as implicit neural representation, super-resolution, and Monte Carlo denoising. Worked also on its efficient implementation in CUDA/C++ kernels for PyTorch and TensorFlow 2.

○ **Paper accepted at NeurIPS 2023** [C8].

12/2021 - 09/2022 **Applied Scientist**
Amazon Web Services AI Labs - Seattle, Washington - Internship (during the Ph.D.)
Worked with the Rekognition team in a research project focused on video predictive understanding, designing new deep learning models/strategies to anticipate and early-recognize events on videos before they occur.
- **Paper preprint [PP1].**

06-09/2020 **Applied Scientist**
Amazon Alexa AI - Turin, Italy - Internship (during the Ph.D.)
Worked in the Automatic Speech Recognition (ASR) team on enabling Alexa to recognizing speech affected by disfluencies and impairments (such as stuttering). During the project, I worked on the multi-lingual modeling of speech disorders, designing and training neural network for ASR, building and mining new relevant datasets, and delivering high-quality results.
- **Paper accepted at ICASSP 2021 [C2].**

11/2018 - 10/2019 **Deep Learning and Computer Vision Engineer**
Aquifi Inc. - Palo Alto, California - Internship (during the Master)
Worked on the development of new deep learning systems for anomaly detection on multi-view structured input images and highly imbalanced datasets. Worked on the designing and training of models, datasets creation and filtration, and the evaluation in different settings. Used a variety of tools, including Python, TensorFlow 1.x, and C++, as well as bash, HTML, javascript, and CSS for experiment visualizations.

Education

2019 - 2022 **Ph.D. in Brain, Mind and Computer Science**
University of Padova, Department of Mathematics and Psychology - Padova, Italy
Thesis: Prediction of Activities and Visual Concepts Under Complex and Changing Conditions
Supervisor: Lamberto Ballan

2016 - 2019 **M.Sc. in Telecommunications Engineering, 110/110 e Lode**
University of Padova, Department of Information Engineering - Padova, Italy
Thesis: Semantic Segmentation for Visual Inspection
Supervisor: Pietro Zanuttigh

2012 - 2016 **B.Sc. in Information Engineering**
University of Padova, Department of Information Engineering - Padova, Italy
Thesis: Algorithms for Sound Synthesis through Physical Modeling
Supervisor: Federico Avanzini

2007 - 2012 **Scientific High School Diploma**
Liceo Scientifico "Ettore Majorana" - Mirano, Venezia, Italy

Academic Work Experience

2020 - 2021 **Teacher Assistant**
University of Padova - Padova, Italy
I have been the teacher assistant for the machine learning course in the Data Science Master Degree. In particular, I gave class lessons to students, prepared the laboratories, prepared machine learning challenges (on deep learning, computer vision, NLP, speech recognition), and I supervised and evaluated the students in their final course project.

2019 - 2023 **Thesis Co-Supervisor**
University of Padova - Padova, Italy
During my Ph.D. I co-supervised several students in their final thesis (9 master students, 1 bachelor student) from the computer science and data science degrees.

2019 - 2023 **Service**

I served as a reviewer in top venues such as: ECCV-2024, CVPR-2024, ACCV-2024, ICCV-2023, CVPR-2023, BMVC-2023, TPAMI-2022, CVPR-2021, ICPR-2020.

Publications & Writing

Blog [B2] **Mood Vectors in Audio Diffusion: Steering Stable Audio 3** [link]
G. Camporese
May 2026

Blog [B1] **Emotion Geometry in LLMs: Finding and Moving the Feeling** [link]
G. Camporese
May 2026

Conf [C9] **Distilling Knowledge for Short-to-Long Term Trajectory Prediction**
S. Das, **G. Camporese**, L. Ballan
IROS 2024 ***(oral)***

Conf [C8] **Empowering Convolutional Neural Networks with MetaSin Activation**
F. Salehi, T. O. Aydin, A. Gaillard, **G. Camporese**, Y. Wang
NeurIPS 2023

Preprint [PP1] **Early Action Recognition with Action Prototypes**
G. Camporese, A. Bergamo, X. Lin, J. Tighe, D. Modolo
arXiv 2023

Conf [C7] **TAMFormer: Multi-Modal Transformer with Learned Attention Mask for Early Intent Prediction**
N. Osman, **G. Camporese**, L. Ballan
ICASSP 2023 ***(oral)***

Conf [C6] **Where are my Neighbors? Exploiting Patches Relations in Self-Supervised Vision Transformer**
G. Camporese, E. Izzo, L. Ballan
BMVC 2022 ***(oral)*** *- CVPRW 2022* ***(oral)*** *- VISMAC 2023* ***(best poster award)***

Conf [C5] **Early Pedestrian Intent Prediction via Features Estimation**
N. Osman, E. Cancelli, **G. Camporese**, P. Coscia, L. Ballan
ICIP 2022

Conf [C4] **Conditional Variational Capsule Network for Open Set Recognition**
Y. Guo*, **G. Camporese***, W. Yang, A. Sperduti, L. Ballan
ICCV 2021

Conf [C3] **SlowFast Rolling-Unrolling LSTMs for Action Anticipation in Egocentric Videos**
N. Osman, **G. Camporese**, P. Coscia, L. Ballan
ICCVW 2021

Conf [C2] **Improved Robustness to Disfluencies in RNN-Transducer Based Speech Recognition**
V. Mendelev*, T. Raissi*, **G. Camporese**, M. Giollo
ICASSP 2021

Conf [C1] **Knowledge Distillation for Action Anticipation via Label Smoothing**
G. Camporese, P. Coscia, A. Furnari, G. M. Farinella, L. Ballan
ICPR 2020

Ph.D. Thesis **Prediction of Activities and Visual Concepts Under Complex and Changing Conditions**
G. Camporese

Ms.C. Thesis **Semantic Segmentation for Visual Inspection**
G. Camporese

Bs.C. Thesis **Algorithms for Sound Synthesis through Physical Modeling**
G. Camporese

Computer Skills

AI/ML - Python, PyTorch, distributed training (multi-node, multi-GPU), slurm, Weights & Biases, TensorFlow 2 (also 1.x in the past), Tensorboard, Keras, NumPy, OpenCV, Pillow, scikit-learn, Pandas, MatplotLib, CUDA (writing customly optimized GPU kernels in CUDA C/C++ for PyTorch and TensorFlow), Hugging Face, JAX (currently learning it), Ultralytics.

Other - Bash, C/C++, Git, AWS (EC2, S3), LaTeX, Web Languages (HTML, CSS, JavaScript, Flask), Matlab, Mathematica, Arduino.

Typical Setup - macOs user for laptops, linux user for servers and desktops, VS Code for writing code (previously experienced Vim user). Usually, I use a 14" MacBook pro, an external frontal monitor 27" and remote linux servers/desktops through ssh.

Languages

Italian Mother tongue

English Full professional proficiency

Extra

2023 **Short Course** - How Diffusion Models Work - *DeepLearning AI*

2023 **Short Course** - ChatGPT Prompt Engineering for Developers - *DeepLearning AI*

2023 **Certification** - 3D Reconstruction, Multiple Viewpoints - *Coursera*

2021 **Pull Request** - Implemented ResNets in the *tinygrad* project (lead by *George Hotz*)

2019 **Certification** - Fundamentals of Reinforcement Learning - *Coursera*

2018 **Certification** - Deep Learning Specialization - *Coursera*

2018 **Certification** - Sequence Models - *Coursera*

2017 **Certification** - Convolutional Neural Networks - *Coursera*

2017 **Certification** - Structuring Machine Learning Projects - *Coursera*

2017 **Certification** - Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization - *Coursera*

2017 **Certification** - Neural Networks and Deep Learning - *Coursera*

2011 **Diploma** - Diploma in Music Theory, *Conservatory Giuseppe Tartini* - Trieste, Italy

Side Experience

2016 - 2018 **Math/Physics Tutor**, *Private lessons* - Padova, Italy

2016 - 2017 **Piano Teacher**, *La Casa Della Musica* - Padova, Italy

Interests

Music, playing guitar, piano, synths, art in general, swimming.