

Curriculum vitae

Guglielmo Camporese

(gool-yell-moe)

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Personal

Birth Camposampiero (PD), Italy, on March 8th 1993. Italian citizen. Male.
Cur. Loc. Padova, Italy
Mobile +39 340 6738579
Email guglielmocamporese@gmail.com
Website guglielmocamporese.github.io
Scholar scholar.google.com/me
LinkedIn linkedin.com/in/guglielmocamporese
GitHub github.com/guglielmocamporese
Twitter @gucamporese

Work Experience

Next **Research Engineer**
Disney Research - Zürich, Switzerland
Working on generative AI and foundation models.

07/2023 - **AI/ML Researcher & Engineer**
Present *Freelancer - Italy (Remote)*

- **Sales Speed AI, Gucci.** Worked on anomaly detection for identifying defects in raw materials used for Gucci products. Specifically, worked on the design, training, and evaluation of the model for anomaly segmentation.
- **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 **Research Scientist**

Disney Research Studios - 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 - **Applied Scientist**

09/2022 *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 using deep learning models. In particular, I investigated and innovated how to anticipate and early-recognize events on videos before they occur.

- Paper under submission.

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 - **Deep Learning and Computer Vision Engineer**

10/2019 *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

10/2019 - **Ph.D. in Brain, Mind and Computer Science**

02/2023 *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

12/2022 - **PostDoctoral Research Fellow**

02/2023 *University of Padova* - Padova, Italy

After my Ph.D. I won a research scholarship and I worked on efficient transfer learning and I co-supervised a project of a Ph.D. student on human trajectory prediction.

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: ICCV-2023, CVPR-2023, BMVC-2023, TPAMI-2022, CVPR-2021, ICPR-2020.

Publications

- Conf [C8] **Empowering Convolutional Neural Networks with MetaSin Activation**
F. Salehi, T. O. Aydin, A. Gaillard, **G. Camporese**, Y. Wang
NeurIPS 2023
- Preprint [PP] **Distilling Knowledge for Short-to-Long Term Trajectory Prediction**
S. Das, **G. Camporese**, L. Ballan
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) - VISMAL 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, and synths, art in general, swimming.