

Marco De Nadai | Ph.D.

✉ me@marcodena.it • 🌐 marcodena.it • 🐦 [denadai2](https://twitter.com/denadai2) • 📺 [denadai2](https://www.youtube.com/channel/UCv3v3v3v3v3v3v3v3v3v3v3)

CURRENT POSITION

RESEARCH SCIENTIST. *Spotify*

2022-Now - *Copenhagen, DK*

- Research on Graph Neural Networks (GNNs) and sequential models to recommend personalized talk content (e.g. podcasts) to millions of users.

EDUCATION

PHD IN COMPUTER SCIENCE. *University of Trento, summa cum laude (highest honors)*

2015–2019 - *Trento, IT*

- Research on Computer Vision and Machine Learning. Published more than **10 scientific papers** in multiple research fields.
- Awarded as **best PhD student** (top 1%) and the Microsoft Azure Research Award.
- Advisors: [Bruno Lepri](#) and [Nicu Sebe](#).

MSC IN COMPUTER SCIENCE. *University of Trento, 110/110 summa cum laude (highest honors)*

2012–2015 - *Trento, IT*

- Exchange student and research intern in Artificial Intelligence at [Vrije Universiteit Amsterdam](#), Netherlands.
- Awarded as **best Master student** (top 1%).

WORK EXPERIENCE

APPLIED SCIENTIST. *Zalando SE*

2021-2022 - *Berlin, DE*

- End-to-end **research** and development of Machine Learning algorithms to generate personalized outfits. Models deployed using **CI/CD** pipelines and AWS. Used by millions of users.
- Multi-disciplinary full-remote environment of applied scientists, engineers, fashion experts and product managers.
- Optimized the models in production and **reduced the costs** of the existing Transformers for outfit generation by **53%**.

RESEARCH SCIENTIST. *Fondazione Bruno Kessler (FBK)*

2019-2021 - *Trento, IT*

- **Led and developed** Computer Vision research for unsupervised image translation and image/video manipulation with GANs.
- Designed cutting-edge algorithms to train Vision Transformers in a small training set regime. Up to +45 points in Top-1 accuracy.
- Published more than 6 papers in different venues (e.g. **NeurIPS, ICCV, CVPR, Science Advances, Nature Scientific Reports**).
- **Co-advised three PhD students** in Computer Vision on a day-to-day basis.

RESEARCH CONSULTANT. *Samsung Electronics*

2019 Oct–Dec - *Remote*

- Designed a sound research plan to model and predict human behaviour from large-scale passively-collected data.
- Created evaluation metrics to monitor the company's key business objectives.

RESEARCH SCIENTIST INTERN. *Vodafone*

2018 Jun–Sep - *London, UK*

- Created and implemented statistical models to predict the mobility and mobile applications usage of 400K people.
- Developed production pipelines to pre-process terabytes of GPS data in the cloud. Advisors: [Nuria Oliver](#) and [Angelo Cardoso](#).

VISITING STUDENT - RESEARCH. *Massachusetts Institute of Technology (MIT)*

2016 Jun–Sep - *Cambridge, MA, USA*

- Improved the performance of descriptive and predictive crime models by $\sim 6\times$ in four multi-million cities (e.g. LA and Bogotá).

SELECTED PUBLICATIONS

I authored **more than 14 papers published** by top conferences and journals. [Google Scholar](#) H-index: 11.

- | | |
|--|--------------------------|
| [1] Spatial Entropy Regularization for Vision Transformers.
E. Peruzzo, Y. Liu, E. Sangineto, M. De Nadai , ..., N. Sebe. | In review
2022 |
| [2] All you need is Regularization (for Smooth Image-to-Image Translations).
Y. Liu, E. Sangineto, N. Sebe, B. Lepri, M. De Nadai . | In review
2022 |
| [3] Efficient Training of Visual Transformers with Small-Size Datasets.
Y. Liu, E. Sangineto, Wei Bi, N. Sebe, B. Lepri, M. De Nadai . PDF . | NeurIPS
2021 |
| [4] Click to Move: Controlling Video Generation with Sparse Motion.
P. Ardino, M. De Nadai , B. Lepri, E. Ricci, S. Lathuilière. PDF . | ICCV
2021 |

- [5] Smoothing the Latent Style Space for Unsupervised Image-to-Image Translation. **CVPR**
2021
Y. Liu, E. Sangineto, ..., B. Lepri, N. Sebe, W. Wang, **M. De Nadai**. [PDF](#).
- [6] Semantic-Guided Inpainting Network for Complex Urban Scenes Manipulation. **ICPR**
2020
P. Ardino, Y. Liu, B. Lepri, **M. De Nadai**. [PDF](#).
- [7] Describe What to Change: A Text-guided Unsupervised Image-to-Image Translation Approach. **ACM MM**
2020
Y. Liu, **M. De Nadai**, ..., X. Almeda, N. Sebe, B. Lepri. [PDF](#).
- [8] Retrieval Guided Unsupervised Multi-domain Image to Image Translation. **ACM MM**
2020
Y. Liu, R. Gomez, **M. De Nadai**, D. Karatzas, N. Sebe, B. Lepri. [PDF](#).
- [9] Strategies and limitations in app usage and human mobility. **Nature Sci. Reports**
2019
M. De Nadai, A. Cardoso, A. Lima, B. Lepri, and N. Oliver. [PDF](#).
- [10] Gesture-to-Gesture Translation in the Wild via Category-Independent Conditional Maps. **ACM MM**
2019
Y. Liu, **M. De Nadai**, G. Zen, N. Sebe and B. Lepri. [PDF](#).
- [11] Are safer looking neighborhoods more lively? a multimodal investigation into urban life. **ACM MM**
2016
M. De Nadai, R. Vieriu, G. Zen, ..., C. A. Hidalgo, N. Sebe, and B. Lepri. [PDF](#).

SKILLS

AI: Sequence models · Computer Vision · GANs · Data Mining · Machine Learning · Deep Learning

Programming: Python · SQL (especially PostgreSQL)

Libraries: Tensorflow · PyTorch · NumPy · Scikit · Pandas · Apache (Py)Spark · PostGIS · Stan · PyMC3

Languages: English full professional proficiency (C1) · Italian (Native)

Other: Databricks · AWS · SageMaker · CI/CD · Docker · Scrum · Board games lover

PROJECTS

GENERATING VIDEOS FROM A SINGLE IMAGE AND A USER TRAJECTORY. 2021

- Led a project to generate realistic videos from a single image and trajectory of one object drawn by the user

GPS MOBILITY FOR COVID-19 SPREADING MODELS AND PREDICTIONS. *Ongoing work* 2020-2021

- Designed and developed the pipeline to process 7.5 TB of raw GPS data, compute the stop locations, OSM stops, home and work locations of **20M** users reducing the costs by 80%. Apache Spark and Azure cloud ETL.

MULTI-MODAL PREDICTION MODEL TO PREDICT REAL ESTATE PRICES. *Industrial project* 2018

- Designed and implemented a production-ready model that improved by 30% the housing price predictions.

LEADERSHIP AND AWARDS

- PhD student guidance: I am supervising three PhD students in computer vision. 2021 - 2022
- **ELLIS Member:** Nominated and elected as member of the **ELLIS** AI society. 2022
- Outstanding reviewer: **CVPR** 2021. 2021
- Best PhD student (top 1%): For the excellent cross-disciplinary scientific contribution. 2020
- **Microsoft Azure Research Award:** Award in Azure cloud credits (€ 20,000.00) for my research. 2017
- 1st place: National Italian Football Federation Match Analysis and Data Mining (€ 5,000.00) competition. 2017
- ACM and Google Travel Awards: Grants based on the research proposal and achievement. 2016

OTHER ACTIVITIES

Reviewer: IEEE TMM · Science Advances · Ubicomp · PLOS ONE · EPJ Data Science · DAMI

PC: NeurIPS '22 · CVPR '20-'22 · ICCV '21 · ICML '22 · IJCAI '20-'22 · AAAI '19-'22 · KDD '18-'19 · ACM MM '19-'22