

Marco De Nadai | Ph.D.

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My research interests focus on Machine Learning and Computer Vision, particularly to the possibilities where they can be used to understand human behaviour. During my PhD, I studied how multi-modal data (e.g. Street View imagery, GPS traces, geographic data) can be jointly used to describe and predict people's activities. Lately, I focus on image-to-image translation and, more broadly, generative models (GANs).

Current position

- 2019 **Research scientist**, *Fondazione Bruno Kessler (FBK)*, Trento, Italy.
May–Now Computer vision models for multi-domain and multi-modal image to-image-translation. I guide two computer vision PhD students on a day-to-day basis.

Education

- 2015–2019 **PhD in Computer Science**, *University of Trento*, Italy, *cum laude*.
Published more than 10 papers in multiple research fields. Advisors: [Bruno Lepri](#) and [Nicu Sebe](#).
2012–2015 **Master of Science in Computer Science**, *University of Trento*, Italy, *110/110 cum laude*.
2013–2014 **Exchange student in Artificial Intelligence**, *Vrije Universiteit Amsterdam*, Netherlands.
2008–2012 **Bachelor of Science in Computer Science**, *University of Udine*, Italy, *100/110*.

Work Experience

- 2019 **Research consultant**, *Samsung Electronics*, Remote.
Oct–Dec Designed a research plan to model and predict human behaviour from passively-collected data of mobile phone applications.
2018 **Research scientist intern**, *Vodafone*, London, UK.
Jun–Sep Created a data-driven model for understanding and predicting the use of Android mobile applications and mobility of people. Mined terabytes of logs and GPS locations. Apache Spark ETL.
Advisors: [Nuria Oliver](#) and [Angelo Cardoso](#)
2016 **Visiting student - Research**, *Massachusetts Institute of Technology (MIT)*, Cambridge, MA, USA.
Jun–Sep Developed a model to predict and describe crime from geographical, mobile phone and census data.
Advisor: [Marta C. Gonzalez](#)
2015 **Data scientist**, *Fondazione Bruno Kessler (FBK)*, Trento, Italy.
Mar–Nov Responsible for designing and developing models to predict human behaviour from multiple sources of data. Mining large scale data from mobile phone logs. Deep learning models for images processing.
2014–2015 **Data scientist intern - Research**, *Telecom Italia*, Trento, Italy.
Analyzed large-scale data from mobile phone call logs to describe the mobility of people in cities.
2014 **Machine Learning intern**, *University of Amsterdam*, Amsterdam, Netherlands.
Mar–Sep Developed a Neural Network and ARIMA models to predict the energy consumption of buildings.

Selected Publications

I published more than 12 papers, in both top conferences and top journals. My Google Scholar h-index is 8.

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| 2020 | <i>Semantic-Guided Inpainting Network for Complex Urban Scenes Manipulation</i>
P. Ardino, Y. Liu, B. Lepri, M. De Nadai . | Under review
Av. upon request |
| 2020 | <i>Describe What to Change: A Text-guided Unsupervised Image-to-Image Translation Approach</i>
Y. Liu, M. De Nadai , ..., X. Almeda, N. Sebe, B. Lepri | ACM MM '20
arXiv:2008.04200 |

- 2020 *Retrieval Guided Unsupervised Multi-domain Image to Image Translation* **ACM MM '20**
Y. Liu, R. Gomez, **M. De Nadai**, D. Karatzas, N. Sebe, B. Lepri [arXiv:2008.04991](#)
- 2019 *GMM-UNIT: Unsupervised Multi-Domain and Multi-Modal Image-to-Image Translation via Attribute Gaussian Mixture Modelling* **Under review**
Y. Liu, **M. De Nadai**, N. Sebe, B. Lepri and X. Almeda [arXiv:2003.06788](#)
- 2019 *Gesture-to-Gesture Translation in the Wild via Category-Independent Conditional Maps* **ACM MM '19**
Y. Liu, **M. De Nadai**, G. Zen, N. Sebe and B. Lepri [arXiv:1907.05916](#)
- 2019 *Strategies and limitations in app usage and human mobility* **Nature Sci. Reports**
M. De Nadai, A. Cardoso, A. Lima, B. Lepri, and N. Oliver [doi:10/ddjc](#)
- 2019 *Precise mapping, density and spatial structure of all human settlements on Earth* **Under review Nature Comm.**
E. Strano, F. Simini, **M. De Nadai**, T. Esch, and M. Marconcini
- 2018 *The economic value of neighborhoods: Predicting real estate prices from the urban environment* **DSAA '18**
M. De Nadai and B. Lepri [doi:10/ddjf](#)
- 2016 *Are safer looking neighborhoods more lively? a multimodal investigation into urban life* **ACM MM '16**
M. De Nadai, R. Vieriu, G. Zen, ..., C. A. Hidalgo, N. Sebe, and B. Lepri. [doi:10/ddjd](#)
- 2016 *The death and life of great italian cities: A mobile phone data perspective* **WWW '16**
M. De Nadai, J. Staiano, R. Larcher, N. Sebe, D. Quercia, and B. Lepri [doi:10/ddjg](#)

Skills

AI Computer Vision · GANs · Data Mining · Machine Learning · Deep Learning
 Programming Python · SQL (especially PostgreSQL) · Java · PHP · Javascript
 Libraries PyTorch · NumPy · Scikit-learn · Pandas · Apache (Py)Spark · PostGIS · Stan · PyMC3

Projects

- 2018 **Prediction of people's activity and real estate prices, Industrial project.**
Designed and implemented a predictive model that dramatically improved the predictions on housing prices from structured data and Google Street View images.
- 2017 **Data fusion of GIS, mobile phone, and census to predict crime, Ongoing work.**
Developed a MCMC Bayesian regression model to explore and predict geo-located crime from structured data and matrices of people's movements between urban areas. Deployed in five cities.

Leadership and awards

- 2020 **PhD student guidance.** I am guiding two PhD students in computer vision.
- 2020 **Best PhD student (top 1%).** For the excellent cross-disciplinary scientific contribution.
- 2017 **Microsoft Azure Research Award.** Azure cloud credits for my research. €20,000.00
- 2017 **1st Place.** Italian Football Federation Match Analysis competition. €5,000.00
- 2016 **Travel Awards.** ACM and Google grants based on the research proposal and achievement.
- 2016 **Best Master student (top 1%).** University of Trento.

Other activities

Reviewer KDD '18-'19 · Transactions on Multimedia · Ubicomp · Plos one · EPJ Data Science · DAMI
 PC IJCAI-PRICAI '20 · SocInfo '20 · ECAI '20 · ACM MM '19-'20 · ICDCS '18 · DAPS '17

Languages

English Full professional proficiency (C1)
 Italian Native