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
May–Now
Research scientist, *Fondazione Bruno Kessler (FBK)*, Trento, Italy.
Computer vision models for multi-domain and multi-modal image to-image-translation. I guide two computer vision PhD students on 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
Oct–Dec
Research consultant, *Samsung Electronics*, Remote.
Designed a research plan to model and predict human behaviour from passively-collected data of mobile phone applications.

2018
Jun–Sep
Research scientist intern, *Vodafone*, London, UK.
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
Jun–Sep
Visiting student - Research, *Massachusetts Institute of Technology (MIT)*, Cambridge, MA, USA.
Developed a model to predict and describe crime from geographical, mobile phone and census data.
Advisor: Marta C. Gonzalez

2015
Mar–Nov
Data scientist, *Fondazione Bruno Kessler (FBK)*, Trento, Italy.
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
Mar–Sep
Machine Learning intern, *University of Amsterdam*, Amsterdam, Netherlands.
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.

2020 *Semantic-Guided Inpainting Network for Complex Urban Scenes Manipulation*
P. Ardino, Y. Liu, B. Lepri, **M. De Nadai**.
Under review
Av. upon request

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