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 in cities. Lately, I also focus on multi-domain and multi-modal image-to-image translation.

Current position

2019 **Research scientist**, *Fondazione Bruno Kessler (FBK)*, Trento, Italy.
Computer vision models for multi-domain and multi-modal image to-image-translation. I also work on the prediction of real estate market values from urban aerial and Google Street View images.

Education

2015–2019 **PhD in Computer Science**, *University of Trento*, Italy, *cum laude*.
Thesis: *Into the City: a Multi-Disciplinary Investigation into Urban Life*
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

2018
Jun–Sep **Research scientist intern**, *Vodafone*, London, UK.
Developed a data-driven model for understanding and predicting the use of Android mobile applications and the 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 of 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

2019 *Unsupervised Attribute Manipulation through Text: a Multi-modal Image-to-Image Translation Approach*
Y. Liu, **M. De Nadai**, …, X. Almeda, N. Sebe, B. Lepri
Under review
Av. upon request

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
Av. upon request

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 in 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`
2016	*The mobile territorial lab: A multilayered and dynamic view on parents' daily lives* S. Centellegher, **M. De Nadai**, M. Caraviello, …, A. Pentland, F. Antonelli, and B. Lepri.	**EPJ Data Science** `doi:10/f89czj`
2015	*A multi-source dataset of urban life in the city of milan and the province of trentino* G. Barlacchi, **M. De Nadai**, R. Larcher, …, A. Vespignani, A. Pentland, and B. Lepri	**Nature Sci. Data** `doi:10/gc4nzj`

Skills

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

Projects

2019 Defining UX Indexes from user behavioural data, *Industrial project - Samsung*.
Defined strategies and metrics to predict UX metrics from mobile phone data activity.

2018 Prediction of people's activity and real estate prices, *Industrial project*.
Developed and implemented a predictive model to predict housing prices from structured data and Google Street View images. Deployed in production in multiple cities.

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.

Awards

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
2017	**Travel and Accomodation Award.** Computational Social Science Summer school.	
2016	**Travel Award.** ACM grant for the Multimedia 2016 conference.	
2016	**Travel Award.** Google grant for the WWW 2016 conference.	
2016	**Best Master student.** University of Trento.	

Other activities

Reviewer	KDD 2018-2019 · Ubicomp · Plos one · EPJ Data Science · DAMI · JOSIS · GeoJournal
PC	ECAI 2020 · ACM MM 2019 · ICDCS 2018 · DAPS 2017

Languages

English	Full professional proficiency (C1)
Italian	Native