# Marco De Nadai | Ph.I

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My research interests focus on Machine Learning and Computer Vision, particularly to the possibilities where Machine Learning can be applied to understand human behaviour. During my PhD, I studied how multi-modal data can be used to describe and predict people's activities in cities. To do so, I built predictive models that fuse structured data (e.g. tabular, geographic), images (e.g. satellite, Google Street View imagery) and GPS locations.

### Current position **Research scientist**, Fondazione Bruno Kessler (FBK), Trento, Italy. 2019 Computer vision generative models (i.e. GANs) for urban aerial and Google Street View imagery. Education **PhD** in Computer Science, *University of Trento*, Italy, *cum laude*. 2015-2019 Thesis: Into the City: a Multi-Disciplinary Investigation into Urban Life Advisors: Bruno Lepri and Nicu Sebe Master of Science in Computer Science, University of Trento, Italy, 110/110 cum laude. 2012-2015 **Exchange student in Artificial Intelligence**, Vrije Universiteit Amsterdam, Netherlands. 2013-2014 **Bachelor of Science in Computer Science**, *University of Udine*, Italy, 100/110. 2008-2012 Work Experience Research scientist intern, Vodafone, London, UK. 2018 Developed a data-driven model for understanding and predicting the use of Android mobile applications and Jun-Sep the 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. Developed a model to predict and describe crime from geographical, mobile phone and census data. Jun-Sep Advisor: Marta C. Gonzalez **Data scientist**, Fondazione Bruno Kessler (FBK), Trento, Italy. 2015 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. Data scientist intern - Research, Telecom Italia, Trento, Italy. 2014-2015 Mining of large-scale data from mobile phone call logs to describe the mobility of people in cities. Machine Learning intern, *University of Amsterdam*, Amsterdam, Netherlands. 2014 Developed a Neural Network and ARIMA models to predict the energy consumption of buildings. Mar-Sep Skills Machine Learning · Deep Learning · Computer Vision · Data Mining Python · SQL (especially PostgreSQL) · Java · C · PHP · Javascript Programming $NumPy \cdot Scikit-learn \cdot Pandas \cdot PyTorch \cdot Apache Spark \cdot PostGIS \cdot Stan \cdot PyMC$ Framework

DeepLearning.ai course · Scalable Machine Learning with Apache Spark Certifications

Linux · Bash · Git OS & Tools

## **Publications**

Gesture-to-Gesture Translation in the Wild via Category-Independent Conditional Maps 2019 L- Yahui, M. De Nadai, G. Zen, N. Sebe and B. Lepri

In review

2019 Apps, Places and People: strategies, limitations and trade-offs in the physical and digital worlds

In review arXiv:1904.09350

M. De Nadai, A. Cardoso, A. Lima, B. Lepri, and N. Oliver

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

Submitted

2018 The economic value of neighborhoods: Predicting real estate prices from the urban environment

M. De Nadai and B. Lepri

DSAA'18 doi:10.1109/ DSAA.2018.00043

2016 Are safer looking neighborhoods more lively? a multimodal investigation into urban life M. De Nadai, R. Vieriu, G. Zen, S. Dragicevic, N. Naik, M. Caraviello, C. A. Hidalgo, N. Sebe, and B. Lepri.

ACM MM '16 doi:10.1145/ 2964284.2964312

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:10.1145/ 2872427.2883084

2016 The mobile territorial lab: A multilayered and dynamic view on parents' daily lives S. Centellegher, M. De Nadai, M. Caraviello, C. Leonardi, M. Vescovi, Y. Ramadian, N. Oliver, F. Pianesi, A. Pentland, F. Antonelli, and B. Lepri.

EPJ Data Science doi:10.1140/epjds/ s13688-016-0064-6

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. Casella, C. Chitic, G. Torrisi, F. Antonelli, A. Vespignani, A. Pentland, and B. Lepri

Nature Scientific data doi:10.1038/ sdata.2015.55

2015 Short-term anomaly detection in gas consumption through arima and artificial neural network forecast

M. De Nadai and M. van Someren

IEEE EESMS '15 doi:10.1109/ EESMS.2015.7175886

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## **Projects**

2019 Generative Adversarial Networks (GANs) for urban spaces, Ongoing work.

Designed a GAN model to propose *what* and *where* a Point of Interest can be added to a neighborhood, conditionally to the aerial image (e.g. satellite or maps) describing it.

2018 **Prediction of people's activity and real estate prices**, *Industrial work*.

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 Grant. Computational Social Science Summer school.

2016 Travel Grant. ACM grant for the Multimedia 2016 conference.

2016 Travel Grant. Google grant for the WWW 2016 conference.

2016 **Best Master student.** University of Trento.

#### Other activities

PC member ACM MM 2019 · ICDCS 2018 · DAPS 2017

Reviewer KDD 2018-2019 · Ubicomp · Plos one · EPJ Data Science · DAMI · JOSIS · GeoJournal

S. Schools Computational Social Science Summer school (2017)

Sant'Antioco, Italy

Complex networks: theory, methods, and applications (2017)

Como, Italy

## Languages

English C1 level

Italian Native