

# LUCA NANETTI

## Curriculum Vitæ

Born in Ferrara, Italy (April 08, 1965)

### Education:

**1994:** MSc in Astronomy, cum laude (University of Bologna, Italy).

**2010:** Functional Neuroanatomy, course held by prof. dr. R.Kortekaas (UMC Groningen, The Netherlands).

Approximate date of the PhD thesis defense: Mar.-Apr. 2015.

### Main skills:

- To perform complex, cutting-edge analyses on big amounts of data, being able to effectually report the results to both technically-oriented and decision-making people alike. I did it at both academical and corporate (Polaroid Digital Imaging, Danone-Nutricia, Friesland Campina) levels.
- To rapidly increase the knowledge/competence of junior team members.
- To positively contribute to maintain a tight, cohesive team. ● On a more technical side:
  - Programming: R (excellent/good), Bash (good), Visual Basic (good), Fortran (intermediate), LaTeX (good).
  - Good command of time series analysis, including, but not limited to, Granger Causality and several flavors of Autoregressive Models.
  - Quite good command of both quantitative and descriptive statistics, including, but not limited to, General Linear Modeling, data modeling using Akaike/Bayesian Information Criterion(s), various flavours of linear regression.
  - Very good knowledge of the SQL language to create/manipulate/interrogate relational databases. Dialects: MariaDB (former MySQL), MS SQL Server EE, SQLite.

Teaching:

**2003-2005:** Database Theory and Application I (Basic) and II (Advanced), University of Ferrara (Italy) at the Master School of Informatics, Faculty of Mathematical, Physical and Natural Sciences.

During the same period I held also the Statistics and Data Analysis as well as Computer Sciences courses for various Bachelor Schools (University of Ferrara, Faculty of Medicine).

Research experience:

**1997 - 2004:** senior research assistant at the Department of Human Physiology, University of Parma (Italy), collaborating to a number of studies under the supervision of prof. Giacomo Rizzolatti and prof. Luciano Fadiga, centered around mirror neurons. During that period I contributed to the discovery of the auditory mirror neurons.

**2005 - 2013:** three postdoc positions as senior researcher at the Neuroimaging Center Groningen, University Center Groningen, The Netherlands.

In detail:

- **2005-2009** (Social Brain Lab, Prof. dr. C. Keysers): introduction of new techniques of functional connectivity analysis borrowed by quantitative economics (Granger Causality and various flavors of autoregressive models: VAR, ARMA, ARIMA, applied to functional Magnetic Resonance Imaging); supervision of PhD students, guiding them in implementing experimental paradigms in Presentation/Eprime, data acquisition, data analysis, statistics). I also investigated the anatomical connectivity of the human insula applying clustering techniques to Diffusion Weighted Imaging datasets.
- **2010-2011** (Neuroimaging Center Groningen, Prof. dr. G.J. ter Horst): senior researcher in a short-term project (1.5 years) aimed to study fMRI measurable effects of benzodiazepines. This was my first completely autonomous project, from obtaining the approval of the Medical Ethical Committee, to creating and implementing the experimental paradigm, to acquiring and analyzing the data. A cohort of 21 subjects was scanned 4 times, under blank/placebo (twice)/medication conditions, investigating working and episodic memory, divided attention, and resting state. Results were shown in several international conferences. During this period I collaborated with the Science Museum (London) providing images and animations for the exhibition “Who Am I?” ([http://www.sciencemuseum.org.uk/visitmuseum/galleries/who\\_am\\_i.aspx](http://www.sciencemuseum.org.uk/visitmuseum/galleries/who_am_i.aspx)).
- **2011-present**, main project: Principal Investigator in a multicenter (University Medical Center Groningen, The Netherlands; Wageningen University and Research Center, The Netherlands) study aimed to study the long-term liking of complex flavors, combining fMRI and repeated exposure (Prof. dr. G.J. ter Horst). I presented some results of this research at HBM 2013, in a poster (#3900, “Individual brain responses to taste cluster into 5 distinct patterns related to dynamic liking”). Other results have been submitted to *Nature*, *Science*, *PNAS* *PlosONE*, and are currently under editorial evaluation. During this project I actively supervised two PhD students.
- **2011-present**, other projects:

- Investigating functional connectivity of hedonic touch of reinnervated penis with Granger Causality in spina bifida patients, under review (PLoS ONE).
- White matter anomalies in schizophrenia patients with visual hallucinations, under review (published in Brain Structure and Function).
- Functional connectivity between anterior/subgenual cingulate and hypothalamus before and after hedonic stimulation, in preparation.
- **Present:** ‘Guest researcher’ until 2018 at the University Medical Center Groningen, The Netherlands. Teacher of Maths, Physics and Natural Sciences at the International High School ‘Smiling’, Ferrara, Italy
- International collaborations:
  - University of Ferrara (Italy), Department of Natural Sciences, prof. Gaetano Zanghirati, investigating possible signal-to-noise ratio improvement of fMRI data via spatial deconvolution of the Bold signal from the smoothing kernel.
  - St. George’s University of London, dr Peter Garrard and Marjolein van Velzen, central nervous system effects of a visuospatial cognitive training on Mild Cognitive Impairment patients, investigated with both functional and diffusion weighted imaging.

Other working experiences:

**1995-1997:** Imago SrL – Polaroid Digital Imaging, Visual Basic programmer. Main projects: create a serial communication interface between computer and high-end scales; create a back-end relational database for quality control pictures, as well as the interface for acquiring them from a variety of video sources. Other duties: provide high-end customers with detailed technical information on products, programs, and procedures.

Areas of Interest:

My strong methodological background is reflected in my curiosity to explore advanced data analysis techniques applied to complex data; often, these techniques are borrowed by other fields, such as econometrics (Granger Causality, VAR models). Most recently, I applied them to (f)MRI datasets, with a focus on the interaction between anatomical and functional connectivity. I like to investigate the relations between ‘active’ areas, as well as the role played by apparently silent ones, always trying to match that with what is known about existing anatomical connections and projections.

The anatomical/functional area I’m most fascinated with is the basal ganglia complex. I’m especially curious about the complex interplay between direct and indirect route, and about the modulatory role played by the Cortico-Striatal-Thalamic-Cortical loops in higher-order functions. Specifically, this line of research shows great potential in explaining/predicting consumers’ behaviours.

Language skills:

Fluent in Italian (mother tongue) and English. Intermediate level in Dutch. Elements of German.

Other interests:

Cooking, recreational sports, playing piano and violin.

Ferrara, 12 November 2014



- Il sottoscritto acconsente, ai sensi del L.Lgs. 30/06/2003 n. 196, al trattamento dei propri dati personali
- Il sottoscritto acconsente alla pubblicazione del presente curriculum vitae sul sito dell'Università di Ferrara

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Publications

(see [http://scholar.google.com/citations?user=fs\\_whncAAAAJ&hl=en&oi=ao](http://scholar.google.com/citations?user=fs_whncAAAAJ&hl=en&oi=ao))

- Jelle R Dalenberg, Luca Nanetti, Remco J Renken, René A de Wijk, Gert J Ter Horst  
**Dealing with Consumer Differences in Liking during Repeated Exposure to Food; Typical Dynamics in Rating Behavior.** PLoS ONE 01/2014; 9(3):e93350
- Ćurčić-Blake, B., Nanetti, L., van der Meer, L., Cerliani, L., Renken, R., Pijnenborg, G. H., & Aleman, A. **Not on speaking terms: hallucinations and structural network disconnectivity in schizophrenia.** Brain Structure and Function, 1-12 (2013)..
- M.H. van Velzen, Luca Nanetti, P.P. de Deyn. **Data modelling in corpus linguistics: How low may we go?** Cortex (in press) (2013).
- M.H. van Velzen, L. Nanetti, P.P. de Deyn **A way with metaphors: An analysis of literary work produced in early MCI due to Alzheimer's disease.** Alzheimer's & Dementia: The Journal of the Alzheimer's Association 9,4, 866-867,2013

- A. Engel, B.S. Hijmans, L. Cerliani, M. Bangert, L. Nanetti, P.E. Keller, C. Keysers **Inter-individual differences in audio-motor learning of piano melodies and white matter fiber tract architecture**. Human Brain Mapping (In press) 2013
- L. Cerliani, R.M. Thomas, S. Jbabdi, J.C.W. Siero, L. Nanetti, A. Crippa, V. Gazzola, H. D'Arceuil, C. Keysers **Probabilistic tractography recovers a rostrocaudal trajectory of connectivity variability in the human insular cortex** Human Brain Mapping, 33, 9, 2005-2034, 2012
- A. Crippa, L. Cerliani, L. Nanetti, J.B.T.M. Roerdink **Heuristics for connectivity-based brain parcellation of SMA/pre-SMA through force-directed graph layout** Neuroimage, 54, 3, 2176-2184, 2011
- J.A. Bastiaansen, M. Thioux, L. Nanetti, C. van der Gaag, C. Ketelaars, R. Minderaa, C. Keysers **Age-related increase in inferior frontal gyrus activity and social functioning in autism spectrum disorder**, Biological psychiatry, 69, 9, 832-838, 2011
- M.B. Schippers, A. Roebroek, R.J. Renken, L. Nanetti, C. Keysers **Mapping the information flow from one brain to another during gestural communication** Proceedings of the National Academy of Sciences, 107, 20, 9388-9393, Proceedings of the National Acad, Sciences, 2010
- S. Sinha, L. Nanetti **Inaccessibility-Inside Theorem for Point in Polygon** arXiv preprint arXiv:1010.0552 2010
- L. Nanetti, L. Cerliani, V. Gazzola, R.J. Renken, C. Keysers **Group analyses of connectivity-based cortical parcellation using repeated *k*-means clustering** Neuroimage, 47, 4, 1666-1677, 2009
- C. Bonifazzi, E. Lodi, G. Maino, V. Muzzioli, L. Nanetti, A. Tartari **Multivariate image analysis of ECoSp Compton spectra** Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, 213, 712-716, 2004
- C. Bonifazzi, E. Lodi, G. Maino, V. Muzzioli, L. Nanetti, N. Ludwig, M. Milazzo, A. Tartari **Investigation of defects in Fresco substrates by means of the ECoSp imaging system and the principal component image analysis** Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, 213, 707-711, 2004
- C. Bonifazzi, A. Tartari, M.N. Cinti, L. Nanetti, R. Pellegrini, R. Pani **Description of the response in scintillation crystal arrays: analytical versus statistical approaches** Nuclear

Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, 213, 231-235, 2004

- C. Keysers, E. Kohler, M.A. Umiltà, L. Nanetti, L. Fogassi, V. Gallese **Audiovisual mirror neurons and action recognition** Experimental brain research, 153, 4, 628-636, 2003