

Vittorio Iacovella

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NILab - Neuroinformatics Lab

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Fondazione Bruno Kessler (FBK)

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Work Experiences

- 2012 - Present: Experimental research / Development of data analysis methods for functional magnetic resonance imaging at NILab - Neuroinformatics Lab
 - Development of methods for assessing validity of longitudinal FMRI studies
 - NeuroBox: A software for medical imaging researchers to seamlessly integrate data analysis and data management on distributed high performance computing.
 - ATTEND - Characterizing and improving brain mechanisms of attention
- 2008 – 2012: Experimental research using FMRI for the PhD program in Cognitive and Brain Sciences.
 - Thesis works: Non-artifactual causal relationship between physiological parameters and FMRI signal; The role of complexity of multisensory inputs for making predictions in an uncertain environment using information theoretic concepts.
- 2011 – 2012: Tutoring and supervising master degree students for calculus and computer science courses, The University of Trento
- 2011: Visiting (2 months) PhD student, Center for Cognitive and Social Neuroscience at The University of Chicago, USA
 - Topics: Designed an FMRI experiment on modulation of attention to visual motion by hearing music and tones and subsequently analyzed the data.
- 2006-2008: Experimental research using FMRI for Bachelor/Master Degree.
 - Topics: Hemodynamic response in functional magnetic resonance imaging studies: the Balloon Model. Functional connectivity MRI study of brain's default mode network response to cognitive tasks.

Education

- 2008 – 2012: PhD program, Cognitive and Brain Sciences at The University of Trento
- 2006 – 2008: Master of Science in Physics with honors (Laurea Magistrale con lode) at Sapienza – The University of Rome
- 2002 – 2006: Bachelor degree in Physics at Sapienza - The University of Rome

Summary of skills

- Brain Imaging:
 - Experimental design, multimodal stimulation (I/O) programming;
 - Time- and frequency-domain analysis, parallel computing;
 - High static field artifacts characterization and removal;
 - Management and data analysis of dataset from Healthy participants / patients in longitudinal fMRI studies
 - Extensive knowledge of AFNI, Freesurfer, SUMA, Nipype, SPM, FSL, MRICro, Psychtoolbox, E-Prime;
 - Developing of dedicated, all-purpose (e.g.: artifacts recognition, validation of preprocessing procedure, image denoising, pre- and post-processing of statistical maps, model-free analysis, connectivity analysis) code from scratch.
- Statistical analysis:
 - Machine Learning
 - Uni- and multi-variate statistics;
 - Bayesian networks, unsupervised methods (e.g. ICA, PCA).
- Computer skills:
 - Extensive working in multiple operating systems (GNU/Linux, Microsoft Windows, MS-DOS, Mac OS X) and softwares (everyday office applications, professional image editing softwares, Virtualbox, Condor and Sun Grid Engine for Parallel Computing);
 - Extensive knowledge of Python, MATLAB, R, Octave, Shell scripting, Perl, C, HTML, XML, LaTeX.

Software - <https://github.com/v-iacovella>

1. (Contributor) NeuroBox - A OwnCloud Plugin to manage data analysis on remote high performance computing infrastructure.
2. Physionoise_fmri - A collection of python scripts to parse raw physiological data coming from Siemens scanners and produce slice - based regressors

Languages

- Mother Tongue: Italian
- English: excellent understanding, speaking, writing
- German: basic (A1 certification) understanding, speaking, writing

Presentations at workshops, schools, seminars:

1. V Iacovella, A Bertana, P Avesani, Functional Hyperalignment of Resting State fMRI Sessions Driven by Autonomic Activity, PRNI - Pattern Recognition in Neuroimaging, Tübingen (Germany) 4-6 June 2014
2. V Iacovella, U Hasson, Magnitude of Task-induced Deactivation of Insula and Anterior Cingulate Cortex is related to Inter-individual Differences in RMSSD 8th Conference of the European Study Group on Cardiovascular Oscillations, ESGCO 2014, Trento, Italy, May 25-28, 2014 (**Talk**)
3. V Iacovella, P Avesani, G Miceli, Disentanglement of Session and Plasticity Effects in Longitudinal fMRI Studies. MLMI 2013; Nagoya (Japan): September 22 2013
4. V Iacovella, M Dalla Vecchia, Y Velegrakis, P Avesani, NeuroBox: Seamless Integration of Data Analysis and Data Management on Distributed High Performance Computing. HPC - MICCAI; Nagoya (Japan): September 22 2013 (**Talk**)
5. V Iacovella, U Hasson Directional relationships between BOLD and Autonomic activity are identifiable with fast-TR fMRI - 3rd Biennial Conference on Resting State Brain Connectivity; Magdeburg (Germany), 5-7 September 2012 (**Talk**)
6. Iacovella, V, Hasson, U, What is the relationship between BOLD and autonomic activity? A fast-TR FMRI study. International school on magnetic resonance and brain function" - 10th Workshop: Brain function investigation by magnetic resonance, electrophysiology and molecular imaging; Erice(TP, Italy): 6- 11 May 2012. (**Talk**)
7. Iacovella, V , Hasson, U, The impact of physiological noise correction on the quality of fMRI data: standards for assessment - "Organization for Human Brain Mapping - 16th Annual Meeting" - Barcelona (Spain) 6-10 June 2010;
8. Iacovella, V, Hasson U, Physiological noise removal: interpretive problems and steps towards establishing validity criteria - "International school on magnetic resonance and brain function" - 8th Workshop: Brain function investigation by magnetic resonance, electrophysiology and molecular imaging; Erice(TP, Italy): 9- 16 May 2010. (**Talk**)
9. Iacovella, V, Hasson U, The impact of the physiological noise correction on the quality of fMRI data: developing a gold standard - "Italian chapter of International Society of Magnetic Resonance in Medicine" - 1st workshop; Milano (Italy): 4th-5th Feb 2010. (**Talk**)
10. Iacovella, V, Gili, T, Giove, F, Maraviglia, B, Brain's default mode network during continuous tasks - "International school on magnetic resonance and brain function" 6th Workshop: Brain function investigation by magnetic resonance, electrophysiology and pharmaceutical probes, in combination; Erice (TP, Italy): 18-25 May 2008

Publications

1. **V Iacovella**, A Bertana, P Avesani (2014) Functional Hyperalignment of Resting State fMRI Sessions Driven by Autonomic Activity (PRNI 2014)
2. **V Iacovella**, U Hasson (2014) Magnitude of Task-induced Deactivation of Insula and

Anterior Cingulate Cortex is related to Inter-individual Differences in RMSSD (ESGCO 2014)

3. **V Iacovella**, P Avesani, G Miceli (2013) Disentanglement of Session and Plasticity Effects in Longitudinal fMRI Studies. MLMI 2013: 155-162
4. **V Iacovella**, M Dalla Vecchia, Y Velegrakis, P Avesani (2013) NeuroBox: Seamless Integration of Data Analysis and Data Management on Distributed High Performance Computing. HPC - MICCAI 2013
5. S Nastase, **V Iacovella**, U Hasson (2013) Uncertainty in visual and auditory series is coded by modality-general and modality-specific neural systems Human brain mapping
6. B Davis, J Jovicich, **V Iacovella**, U Hasson (2013) Functional and Developmental Significance of Amplitude Variance Asymmetry in the BOLD Resting-State Signal. Cerebral Cortex
7. MJ Tobia, **V Iacovella**, B Davis, U Hasson (2012) Neural systems mediating recognition of changes in statistical regularities NeuroImage
8. Tobia, MJ, **Iacovella, V**, Hasson, U (2012). Multiple sensitivity profiles to diversity and transition structure in non-stationary input. Neuroimage, 60, 2:991-1005.
9. **Iacovella, V**, Hasson, U (2011). The relationship between BOLD signal and autonomic nervous system functions: implications for processing of "physiological noise". Magn Reson Imaging, 29, 10:1338-45.
10. Giove, F, Gili, T, **Iacovella, V**, Macaluso, E, Maraviglia, B (2009). Images-based suppression of unwanted global signals in resting-state functional connectivity studies. Magn Reson Imaging, 27, 8:1058-64.

Attended workshops, schools, seminars

1. MICCAI 2013 - 16th conference on Medical Imaging Computing and Computing Aided Intervention; Nagoya (Japan) 22-26 September 2013
2. Bayesian Computational Models – Institute of Cognitive Sciences and Technologies Rome (Italy): 23-27 January 2012
3. Cognitive Neuroscience Society – 18th annual meeting – San Francisco (CA), USA: 2-5 April 2011
4. International Congress on Default Mode Network and other intrinsic networks in health and disease - Can Massalera, Sant Boi del Llobregat, Barcelona (Spain): 4-5 June 2010
5. 4th International Summer School in biomedical Engineering - Brain connectivity and information transfer; Leipzig (DE) 13-27 August 2009
6. International school on magnetic resonance and brain function" - 7th Workshop: Brain function investigation by magnetic resonance, electrophysiology and pharmaceutical probes, in combination; Erice (TP, Italy): 24-28 May 2009
7. International school on magnetic resonance and brain function" - 5th Workshop: Brain function investigation by magnetic resonance, electrophysiology and pharmaceutical probes, in combination; Erice (TP, Italy): 6-13 May 2007

Trento, Jan 29th, 2015