

# Marco Buiatti

Centro Interdipartimentale Mente e Cervello (CIMEC)  
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## Generalità:

Data e luogo di nascita: 20/01/1972, Firenze  
Nazionalità: Italiana  
Lingue: Italiano (madre lingua), Inglese e Francese (fluente)  
Stato di Famiglia: Coniugato, 2 figli (2003, 2008)

## Esperienza professionale:

**2015 – oggi**      **Fisico Responsabile Laboratorio EEG,  
Neonatal Neuroimaging Unit, CIMEC  
Categoria EP (Elevata Professionalità)**  
Centro Interdipartimentale Mente e Cervello (CIMEC)  
Università di Trento

### *Principali mansioni e responsabilità:*

- Responsabile installazione, funzionamento, manutenzione del laboratorio EEG per neonati del CIMEC installato presso l'Ospedale di Rovereto
- Responsabile formazione utenti EEG;
- Responsabile analisi dati EEG;
- Supervisione tirocinio e tesi di laurea (Laurea Magistrale in Psicologia, Dipartimento di Psicologia e Scienze Cognitive, Master of Cognitive Neuroscience, CIMEC, Università di Trento)
- Sviluppo software originale analisi dati EEG per neonati.
- Conduzione progetti di ricerca sulle basi neurali delle funzioni cognitive nei neonati, in collaborazione con altri membri del CIMEC.

**2010 – 2014**      **Ingegnere di Ricerca – Categoria IR2, livello 7**  
Area "Concezione e Sviluppo di Sperimentazione Scientifica"  
INSERM Cognitive Neuroimaging Unit (U992)  
Neurospin, Gif-sur-Yvette, France

### *Principali mansioni e responsabilità:*

- Responsabile tecnico dei laboratori di Magnetoencefalografia (MEG) e Elettroencefalografia (EEG) di Neurospin;
- Responsabile formazione utenti MEG/EEG;
- Responsabile analisi dati MEG/EEG;
- Co-supervisione di Post-Doc (S. Monto, con Prof. S. Dehaene)
- Co-supervisione di dottorandi della scuola dottorale "Cerveau Cognition Comportement", Université Pierre et Marie Curie, Paris, France  
(1) C. Kabdebon (con Dr. G. Dehaene-Lambertz).

- (2) V. Borghesani (con Dr. M. Piazza).
- Partecipazione al comitato organizzativo della conferenza internazionale BIOMAG – Paris 2012.

**2007- 2009: Postdoctoral Fellow**  
 Centro Interdipartimentale Mente/Cervello  
 Università di Trento, Italy

*Principali mansioni e responsabilità:*

- Ricerca in Neuroscienze Cognitive;
- Sviluppo del software ADJUST per la rimozione di artefatti in EEG;
- Responsabile valutazione tecnica per acquisto sistema EEG compatibile con MRI;
- Co-supervisione studente di Master:  
 A. Mognon, Dipartimento di Ingegneria delle Telecomunicazioni, Università di Trento (con Prof. L. Bruzzone).
- Insegnamento metodi di analisi EEG/MEG “Advanced Methods of EEG/MEG Data Analysis” nell’ambito del corso “Metodi Indagine Neuroscienze Cliniche Cognitive” presso la Facoltà di Scienze Cognitive dell’Università di Trento (2008: 3 ore; 2009: 8 ore).

**2005 –2006 Postdoctoral Fellow**  
 INSERM Cognitive Neuroimaging Unit (U992)  
 Orsay, France.

*Principali mansioni e responsabilità:*

- Ricerca in Neuroscienze Cognitive;
- Ottimizzazione set-up EEG del laboratorio.

**2002 - 2005: Postdoctoral Fellow**  
 Neurophysics and Physiology Laboratory (CNRS U8119)  
 Paris, France.

*Principali mansioni e responsabilità:*

- Ricerca in Neuroscienze Computazionali.

**Educazione :**

**2002 - 2006: Dottorato di Ricerca in Neuroscienze Cognitive**  
 Scuola Dottorale “Cerveau Cognition Comportament”,  
 Université Paris VI, Paris, France.  
 Supervisore: Dr. Carl van Vreeswijk.

**1999 - 2001: Master (Mphil) in Neuroscienze Computazionali**  
 Gatsby Computational Neuroscience Unit (UCL), London, UK.  
 Supervisore: Prof. Geoffrey Hinton.

**1998 - 1999: Postgraduate Research Fellow**

Istituto di Biofisica (CNR) Pisa, Italy.  
Supervisore: Prof. Paolo Grigolini.

**1990 - 1997: Laurea in Fisica (110/110 summa cum laude).**  
Università di Pisa, Italy.  
Supervisore: Prof. Paolo Grigolini.

**Formazione professionale :**

- 2012 Cryogenics  
Centre Energie Atomique, Saclay, France.
- 2012 Brainstorm (software per analisi EEG/MEG)  
Satellite Course of Biomag, 18<sup>th</sup> International Conference on  
Biomagnetism, Paris, France.
- 2011 EEG/MEG SPM (software per analisi EEG/MEG)  
Functional Imaging Laboratory, University College London, London,  
UK.
- 2011 Formazione professionale per operatori MEG Elekta  
Hopital La Salpetriere, Paris, France.
- 2007 EEGLAB Workshop (software per analisi EEG)  
Aspet, France.
- 2005 Synchronization in nonlinear systems and complex networks  
Societa' Italiana Caos e Complessita', Firenze, Italy
- 2004 Advanced methods of elaboration of biomedical signals  
Italian national Group of Bioengineering, Bressanone, Italy.
- 1999 School on Neural Information Processing  
Abdus Salam International Centre for Theoretical Physics,  
Trieste, Italy.

**Attività editoriale :**

**Editorial board:** Theoretical Biology Forum.

**Ad-Hoc Reviewer per riviste internazionali:** Neuroimage, Journal of Neuroscience Methods, International Journal of Psychophysiology, Frontiers in Human Neuroscience, Frontiers in Neuroscience – Brain Imaging Methods, Cognitive Neuropsychology, Brain Connectivity, Physical Review E, Chaos Solitons & Fractals, Physica A, Journal of Biological Physics, Theoretical Biology Forum, IEEE Transactions Biomedical Engineering, IEEE Transactions on Neural Systems and Rehabilitation Engineering, Computers in Biology and Medicine, ICASSP (IEEE Signal Processing Society), European Signal Processing Conference (EUSIPCO 2015)

**Lezioni su invito :**

“Frequency-tagging”, nell’ambito del corso “Ecole Oscillations Paris”,  
Institute Cerveau Moelle epiniere, Paris, France, 2011.

“Multidimensional analysis of the neural dynamics underlying a cognitive process”,  
nell’ambito della scuola estiva “Bioingegneria per le Scienze Cognitive”,  
Bressanone, Italy, 2009.

“Correlations in DNA sequences : a tool to study their complex structure”,  
Istituto Politecnico, Torino, Italy 2005.

## **Publicazioni :**

### **Articoli in riviste internazionali**

Borghesani V, Pedregosa F, **Buiatti M**, Amadon A, Eger E, Piazza M,  
Word meaning in the ventral visual path: a perceptual to conceptual gradient of  
semantic coding,  
*NeuroImage* 143,128-140 (2016)

Kabdebon C, Pena M, **Buiatti M**, Dehaene-Lambertz G,  
Electrophysiological evidence of statistical learning of long-distance dependencies in  
8-month-old preterm and full-term infants,  
*Brain and Language* 148, 25-36 (2015)

Strauss M, Sitt JD, King JR, Elbaz M, Azizi L, **Buiatti M**, Naccache L, van  
Wassenhove V, Dehaene S,  
Disruption of hierarchical predictive coding during sleep  
*Proceedings of the National Academy of Sciences* 112 (11), E1353-E1362 (2015).

Strauss M, Sitt JD, King JR, Elbaz M, Azizi L, **Buiatti M**, Naccache L, van  
Wassenhove V, Dehaene S,  
Atteinte des processus de prédiction mais conservation de l’adaptation sensorielle au  
cours du sommeil,  
*Médecine du Sommeil*, 12 (1), 58 (2015)

Andres M, Finocchiaro C, **Buiatti M**, Piazza M. Motor interference during lexico-  
semantic processing of action verbs,  
*Cognition* 134, 174-184 (2015).

Pegado F, Comerlato E, Ventura F, Jobert A, Nakamura K, **Buiatti M**, Ventura P,  
Dehaene-Lambertz G, Kolinsky R, Morais J, Braga LW, Cohen L, Dehaene S. Timing  
the impact of literacy on visual processing,  
*Proceedings of the National Academy of Sciences* 111 (49), E5233-E5242 (2014).

Borghesani V, Pedregosa F, Eger E, **Buiatti M**, Piazza M,  
A perceptual-to-conceptual gradient of word coding along the ventral path,  
*Pattern Recognition in Neuroimaging*, in press.

Mognon A, Bruzzone L, Jovicich J, **Buiatti M**,  
ADJUST: An Automatic EEG artifact Detector based on the Joint Use of Spatial and  
Temporal features.  
*Psychophysiology* 48 (2), 229-240 (2011).

Forget J, **Buiatti M**, Dehaene S,

Temporal integration in visual word recognition,  
*Journal of Cognitive Neuroscience* 22(5), 1054-1068 (2010).

**Buiatti M**, Pena M, Dehaene-Lambertz G,  
Investigating the neural correlates of continuous speech computation with frequency-  
tagged neuroelectric responses,  
*Neuroimage* 44, 509-519 (2009).

Kalashyan A, **Buiatti M**, Grigolini P,  
Ergodicity breakdown and scaling in single sequences,  
*Chaos, Solitons & Fractals* 39(2), 895-909 (2009).

**Buiatti M**

The correlated nature of large scale brain activity unveiled by the resting brain.  
*Biology Forum* 101, 353-73 (2008).

Buiatti M, **Buiatti M**, Chance vs.  
Necessity in Living Systems: A False Antinomy,  
*Biology Forum* 101, 29-66 (2008).

**Buiatti M**, Papo D, Baudonniere PM, van Vreeswijk C,  
Feedback modulates the temporal scale-free dynamics of brain electrical activity in a  
hypothesis testing task,  
*Neuroscience*, 146 (3), 1400-1412 (2007).

**Buiatti M**, Buiatti M,  
Towards a statistical characterisation of the Living State of Matter,  
*Chaos, Solitons & Fractals*, 20 (1), 55-61 (2004).

**Buiatti M**, Van Vreeswijk C,  
Variance normalisation: a key mechanism for temporal adaptation in natural vision?,  
*Vision Research* 43 (17), 1895-1906 (2003).

Buiatti M, Acquisti C, Mersi G, Bogani P, **Buiatti M**, The biological meaning of DNA  
correlations, in "Fractals in Biology and Medicine, Volume III, Mathematics and  
Biosciences in interaction", Birkhauser Ed., Berne (2002).

Buiatti M and **Buiatti M**,  
The living state of matter,  
*Biology Forum*, 94 (1), 59-82 (2001).

West BJ, Allegrini P, **Buiatti M**, Grigolini P,  
Non-normal Statistics of DNA Sequences of Prokaryotes,  
*Journal of Biological Physics* 26 (1), 17-25 (2000).

**Buiatti M**, Grigolini P, Montagnini A,  
Dynamic Approach to the Thermodynamics of Superdiffusion,  
*Physical Review Letters* 82, 3383-3387 (1999).

**Buiatti M**, Grigolini P, Palatella L,  
A non extensive approach to the entropy of symbolic sequences,  
*Physica A* 268, 214 (1999).

Allegrini P, **Buiatti M**, Grigolini P, West BJ,  
Non-Gaussian statistics of anomalous diffusion: the DNA sequences of prokaryotes,

*Physical Review E* 58, 3640-3648 (1998).

Allegrini P, **Buiatti M**, Grigolini P, West BJ,  
Fractional Brownian Motion as a Nonstationary Process: an Alternative Paradigm for  
DNA sequences,  
*Physical Review E* 57, 4558-4567 (1998).

### **Capitoli di libri:**

**Buiatti M**, Analisi multidimensionale della dinamica neurale di un processo cognitivo,  
in *Bioingegneria per le Scienze Cognitive*, Edizioni Patron, Bologna (Italy), (2009).

**Buiatti M**, Correlations, in Marcello Buiatti, *Lo stato vivente della materia*, Edizioni  
UTET, Torino (2000).

### **Atti di convegno pubblicati:**

Borghesani V, Pedregosa F, Eger E, **Buiatti M**, Piazza M, A perceptual-to-  
conceptual gradient of word coding along the ventral path.  
IEEE Pattern Recognition in Neuroimaging, Tubingen (Germany), 2014.

Kabdebon C, **Buiatti M**, Pena M, Dehaene-Lambertz G, EEG evidence of statistical  
learning in preverbal infants, *Biomag*, 19<sup>th</sup> International Conference on  
Biomagnetism, Halifax, Canada, 2014.

Kabdebon C, **Buiatti M**, Pena M, Dehaene-Lambertz G, Neural Correlates of  
Statistical Language Learning, Organization of Human Brain Mapping, Hamburg  
(Germany), 2014.

Kabdebon C, **Buiatti M**, Pena M, Dehaene-Lambertz G, EEG evidence of statistical  
learning in preverbal infants, *DuCog Conference on Language and Conceptual  
Development*, Dubrovnik (Croatia), 2014.

Borghesani V, Eger E, **Buiatti M**, Piazza M, Conceptual spaces in the brain: the  
quest for semantic representations with fMRI, Rovereto Workshop on Concepts,  
Actions, and Objects, Rovereto, 2014.

**Buiatti M**, Finocchiaro C, Caramazza A, Dehaene S, Piazza M, Word meaning in the  
human brain: evidence for distinct category specific neural semantic spaces. *Biomag*,  
18<sup>th</sup> International Conference on Biomagnetism, Paris, France, 2012.

Roger C, **Buiatti M**, van Wassenhove V Self-monitoring of internal clock shifts:  
automatic vs. conscious access to time. *Biomag*, 18<sup>th</sup> International Conference on  
Biomagnetism, Paris, France, 2012.

Roger C, **Buiatti M**, van Wassenhove V How do cognitive mechanisms react and  
adjust after a disruption of the internal clock? A combined MEG-EEG study. Society  
for Neurosciences, New-Orleans, USA, 2012.

Asseconi S, Bianchi A, **Buiatti M**, Ferrari P, Mazza V, Schwarzbach JV, Jovicich J.  
A nonlinear template-based approach for BCG artifact removal in EEG-fMRI  
recordings at high fields. Organization of Human Brain Mapping, Barcelona, 2010.

Asseconi S, **Buiatti M**, Ferrari P, Mazza V, Schwarzbach JV, Jovicich J.

Ballistocardiographic artifact removal from simultaneous EEG-fMRI recordings at 4 T. ISMRM Italian Chapter Annual Meeting, Milan, Italy, 2010.

**Buiatti M**, Pena M, Dehaene-Lambertz G, Using brain 'frequency-tagging' resonance properties to disentangle neural responses to different hierarchical units of continuous speech. , XIX Congresso Nazionale della Società Italiana di Biofisica Pura e Applicata (SIBPA), Roma (Italy), September 17-20, 2008 (*refereed abstract*).

Sigman M, **Buiatti M**, Dehaene S, Neurophysiologic correlates of sequential processing in the human brain, Society for Neuroscience Meeting, Atlanta (USA), October 13-17, 2006 (*refereed abstract*).

Garello R, **Buiatti M**, Galleani L, On the study of correlation in DNA sequences, I FIMA (Federazione Italiana Matematica Applicata) International Conference "Models and Methods for Human Genomics", Ayas-Champoluc, Aosta Valley (Italy), January 23-27, 2006 (*refereed abstract and selected oral presentation*).

**Buiatti M**, Van Vreeswijk C, Variance normalisation: a key mechanism for temporal adaptation in natural vision? The Annual Computational Neuroscience Meeting, Alicante, Spain, July 5-9, 2003. (*refereed abstract and selected oral presentation*)

**Buiatti M**, Van Vreeswijk C, Variance normalisation: a crucial mechanism for dynamic adaptation in natural vision? Complessita' e scienze della vita, Italian Society for Chaos and Complexity, June 14-15 2002, Pisa, Italy. (*refereed abstract and oral presentation*)

Buiatti M, Acquisti C, Mersi G, Bogani P, **Buiatti M**, The biological meaning of DNA correlations, Fractals 2000 in Biology and Medicine, March 8-11 2000, Ascona, Switzerland.

**Buiatti M**, Allegrini P, Grigolini P, Randomness, heterogeneity and scaling in DNA walks, American Physical Society Centennial Meeting Program, March 20-26, 1999, Atlanta, GA. (*refereed abstract and oral presentation*)

Allegrini P, **Buiatti M**, Grigolini P, West B, Fractional Brownian motion in DNA sequences as a non-stationary process, Meeting of the Texas District of the American Physical Society, October 1996, Arlington, TX. (*refereed abstract*)