


GIAN MARCO DUMA

POST-DOCTORAL RESEARCH FELLOW-INSERM-AIX-MARSEILLE UNIVERSITY

Passionate about applied research, I first developed my expertise in neuroimaging data analysis and the methodology of research during the PhD, and then I moved to the investigation of neural substrate and cognitive effects of epilepsy.

Currently, my research is focused on the use of computational modelling for the identification of the epileptogenic zone via EEG, in conjunction with simulation of non-invasive brain stimulation.

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WORK EXPERIENCE

Post-Doctoral Research Fellow-INSERM-Aix-Marseille University

Marseille, France

9/21 - ongoing

- Neural mass and neural field modelling applied to the identification of the epileptogenic zone via SEEG and EEG derived signals
- Simulation of Temporal Interference stimulation via Sim4Life and SIMNIBS software
- Collaboration with a team of 6 people for the integration of non-invasive stimulation in the pre-surgical evaluation

Post-Doctoral Research Fellow -University of Padua

Padova, Italy

03/2020 - 08/2021

- Time resolved network analyses during interictal epileptiform discharges
- Source localization for epileptogenic zone identification together with surface based measures (cortical thickness, fractal dimensionality)
- Lab and medical pre-surgical meetings
- Conference presentation

High density EEG data analyst - University of Padua

Padova, Italy

11/2019 – 3/2020

- Data analysis of multiple High Density EEG dataset
- Writing and editing publication on international scientific journals

PhD in Psychological Sciences – University of Padua

Padova, Italy

09/2016-09/2019

- Neuroimaging and statistical analyses methods
- Research and methodology
- Simulation of Temporal Interference stimulation via Sim4Life and SIMNIBS software

Research Trainee Internship - Montreal Neurological Institute - McGill University

Montreal, Canada

5/2018 – 11/2018

- Methodological aspects of EEG high density signal analysis specially regarding, source modelling, time frequency and connectivity analyses.
- Matlab coding to produce personal analysis pipeline and to automatize analysis processes.

Post-graduate Internship - Childhood Neuropsychiatry unit - Bellaria Hospital

Bologna, Italy

09/2015-03/2016

- Clinical neuropsychology and neuropsychological assessment in epilepsy
- Development of personal and technical capabilities to conduct a complete neuropsychological assessment and diagnosis
- Clinical application of electroencephalography
- Research on epilepsy surgery and cognitive functions

TEACHING EXPERIENCE

Advanced Courses for Scientific Research (CARS) - Cortical sources analysis via Brainstorm software - University of Padua

Padova, Italy

04/2021

10/2020

Advanced Courses for Scientific Research (CARS) - EEG analysis via EEGLAB toolbox - University of Padua





Padova, Italy

06/2019

EDUCATION

- PhD in Psychological Sciences** – University of Padua
Thesis: The impact of attention on information maintenance in visual short term memory: a neurofunctional investigation
Padova, Italy
09/2016-09/2019
- Master Degree in Neuroscience and Neuropsychological Rehabilitation** - University of Padua
Thesis: Non-locality and retrocausality: a study of quantum-like features related to consciousness
Padova, Italy
10/2013-07/2015
- Bachelor Degree in Psychological Sciences and Techniques** – D'Annunzio University of Chieti-Pescara
Thesis: Chemical and biological elements of Neurogenesis and Neuroplasticity
Chieti, Italy
10/2010-09/2013

TECHNICAL SKILLS

-  **Programming:** Python Matlab, R,
-  **Data analysis:** R, Jasp, SPSS, EEGLAB, Brainstorm, SPM12, network analysis
-  **Medicine and healthcare:** Freesurfer, Sim4Life, The Virtual Brain, SIMNIBS
-  **Research:** data collection (E-Prime, OpenSesame, PsychoPy)

LANGUAGES

Italian: Native

English: Proficient (TOEFL certification)

French: Intermediate

PUBLICATIONS

- Mento, G., Toffoli, L., Della Longa, L., Farroni, T., Del Popolo Cristaldi, F., & Duma, G. M. (2022). Adaptive Cognitive Control in Prematurely Born Children: An HD-EEG Investigation. *Brain Sciences*, 12(8), 1074.
- Mento, G., Duma, G. M., Valenza, E., & Farroni, T. (2022). Face specific neural anticipatory activity in infants 4 and 9 months old. *Scientific Reports*, 12(1), 1-15.
- Cristaldi, F. D. P., Buodo, G., Duma, G. M., Sarlo, M., & Mento, G. (2022). Unbalanced functional connectivity at rest affects the ERP correlates of affective prediction in high intolerance of uncertainty individuals: A high density EEG investigation. *International Journal of Psychophysiology*, 178, 22-33.
- Baggio, M., Toffoli, L., Da Rold, M., Duma, G. M., Mento, G., Morao, V., ... & Bonanni, P. (2022). Neuropsychological and behavioral profiles of self-limited epileptic syndromes of childhood: a cross-syndrome comparison. *Child Neuropsychology*, 1-25.
- Bonanni, P., Baggio, M., Duma, G. M., Negrin, S., Danieli, A., & Giorda, R. (2021). Developmental and epilepsy spectrum of Poirier–Bienvenu neurodevelopmental syndrome: Description of a new case study and review of the available literature. *Seizure*, 93, 133-139.
- Duma, G. M., Di Bono, M. G., & Mento, G. (2021). Grounding Adaptive Cognitive Control in the Intrinsic, Functional Brain Organization: An HD-EEG Resting State Investigation. *Brain sciences*, 11(11), 1513.
- Duma, G. M., Danieli, A., Vettorel, A., Antoniazzi, L., Mento, G., & Bonanni, P. (2021). Investigation of dynamic functional connectivity of the source reconstructed epileptiform discharges in focal epilepsy: A graph theory approach. *Epilepsy Research*, 176, 106745.
- Duma, G. M., Danieli, A., Morao, V., Da Rold, M., Baggio, M., Toffoli, L., ... & Mento, G. (2021). Implicit cognitive flexibility in self-limited focal epilepsy of childhood: An HD-EEG study. *Epilepsy & Behavior*, 116, 107747.

Cutini, S., Duma, G. M., & Mento, G. (2021). How time shapes cognitive control: A high-density EEG study of task-switching. *Biological Psychology*, 160, 108030.

Duma, G.M., Granzio, U., & Mento, G. (2020). Should I stay or should I go? How local-global implicit temporal expectancy shapes proactive motor control: an hdeeg study. *NeuroImage*, 117071.

Gianfranchi, E., Mento, G., Duma, G. M., Chierchia, C., Sarlo, M., & Tagliabue, M. (2020). Electrophysiological correlates of attentional monitoring during a complex driving simulation task. *Biological Psychology*, 107918.

Bilucaglia, M., Duma, G. M., Mento, G., Semenzato, L., & Tressoldi, P. (2020). Applying machine learning EEG signal classification to emotion related brain anticipatory activity. *F1000Research*, 9(173), 173.

Duma, G.M., Mento, G., Cutini, S., Sessa, P., Baillet, S., Brigadoi, S., & Dell'Acqua R. (2019). Functional dissociation of anterior cingulate cortex and intraparietal sulcus in visual working memory. *Cortex*, 121, 277-291.

Duma, G. M., Mento, G., Manari, T., Martinelli, M., & Tressoldi, P. (2017). Driving with intuition: a preregistered study about the EEG anticipation of simulated random car accidents. *PLoS one*, 12(1), e0170370.

Duma GM, Mento G, Semenzato L & Tressoldi P. EEG anticipation of random high and low arousal faces and sounds. *F1000Research* 2019, 8:1508 (<https://doi.org/10.12688/f1000research.20277.1>)

Facco, E., Casiglia, E., Al Khafaji, B. E., Finatti, F., Duma, G. M., Mento, G., & Tressoldi, P. (2019). The neurophenomenology of out-of-body experiences induced by hypnotic suggestions. *International Journal of Clinical and Experimental Hypnosis*, 67(1), 39-68.

Tressoldi, P. E., Pederzoli, L., Caini, P., Ferrini, A., Melloni, S., Richeldi, D., ... & Duma, G. M. (2014). Mind-matter interaction at a distance of 190 km: effects on a random event generator using a cutoff method. *NeuroQuantology*, 12,3,337-343.

CONFERENCES AND SEMINARS

International Conference for Technology and Analysis of Seizures (Bern) 04 – 08/07/2022

Simulation of seizure induction by noninvasive stimulation: A Temporal Interference approach (poster)

International school of brain cells & circuits - Modelling the Brain (Erice) 30/11-04/12/2021

Modelling deep brain stimulation for diagnosis in refractory focal epilepsy (poster)

Giornate di neuropsicologia dell'età evolutiva (Days of developmental neuropsychology, Brixen) 16-18/01/2020:

The effect of local-global probabilistic context on implicit temporal expectation in children with epilepsy (poster)

Cracow Cognitive Conference (Cracow) 10-11/05/2019:

Functional dissociation of anterior cingulate cortex and intraparietal sulcus in visual working memory (poster)

Cognitive Science Arena (Brixen) 17-18/02/2017:

Driving with intuition: a preregistered study about the EEG anticipation of simulated random car accidents (Talk)

EEGLAB ASPET workshop 3-7/07/2017

Timing Research Forum, Strasbourg, France 23-25/10/ 2017

Sixth Biennial Conference on Resting State and Brain Connectivity, 24-25/09/ 2018

