



DAVIDE MOMI

Post-Doctoral Research Fellow
Whole Brain Modelling Group
Krembil Centre for Neuroinformatics (CAMH)
<https://davi1990.github.io>



@Davide Momi



@Davide Momi



@DaveMomi



@Davi1990

EDUCATION:

Ph.D., Business and Behavioural Sciences, December 2020

University "G. d'Annunzio" of Chieti, Chieti, Italy

Master of Science, Neurosciences and Neuro-Psychological Rehabilitation, November 2015

University of Bologna, Cesena, Italy

Bachelor of Science, Psychological Sciences and Techniques, March 2013

University of Perugia, Perugia, Italy

RESEARCH EXPERIENCE:

Jan 2024 - underway

Keller Lab

Stanford University

Post-Doctoral Research Fellow under the supervision of Corey Keller

Laboratory: - Keller Lab – Stanford

Focus of my projects:

- Whole-brain modelling of simultaneous stereo and scalp EEG for studying the physiological mechanisms underlying large brain network dynamics
- Using a computational whole-brain model for predicting the outcome of Theta Burst Stimulation (TBS) protocol in patients with Major Depressive Disorders
- Exploring the emergence of consciousness and the network dynamics by investigating how the brain responds to external perturbations and using a computational model for analysing the dynamical system dynamics

Whole Brain Modelling Group

Krembil Centre for Neuroinformatics (CAMH)

Mar 2021- Dec 2023

Post-Doctoral Research Fellow under the supervision of John David Griffiths

Laboratory: - Whole Brain Modelling Group- Toronto

Projects I'm currently involved in:

- Studying longitudinal effect of Theta Burst Stimulation (TBS) protocol using a TMS-EEG dataset where single pulses were delivered over the left dorsolateral prefrontal cortex (DLPFC)

- Developing physiological-based, connectome-based computational models of large-scale brain network dynamics following an external perturbation, mimicking brain stimulation
- Estimating of neurophysiological model parameters using a deep learning-based computational architecture
- Developing a model to simulate TMS-induced signal propagation dynamics and to investigate questions around the physiological basis of TEPs generation
- Demonstrating fast and robust recovery of individual subjects' empirical TEPs propagation patterns in model-generated activity time series both at channels and source level
- Demonstrating how a virtual "lesion" compromised the TMS-evoked brain dynamics only if nodes' connections were removed in a manner targeted attacks and not as random failure
- Developing a model to for predicting clinical outcomes in response to rTMS treatment in Major Depressive Disorder (MDD).
- Applying the TEPs model to a MDD clinical trial dataset (Dr. Keller – Stanford University) and a healthy dataset (Dr. Shafi – Harvard University) where single pulse TMS was applied to DLPFC before and after 30 days of rTMS treatment.

**Department of Neuroscience, Imaging and Clinical Sciences
University "G. d'Annunzio" of Chieti**

Sept 2017- Dec 2020

Ph.D. Candidate of Mirco Fasolo, Ph.D

Laboratories: -*Martinos Center for Biomedical Imaging - Boston*
-*Memory and Aging Laboratory - Chieti*

Focus of my projects:

- Developing a model to predict TMS signal propagation based on tractography and electrophysiological measures, mainly obtained via source analysis reconstruction.
- Working with both HCP and ADNI dataset to study the controllability of structural and functional brain network
- Analysis on the Human Connectome Project (HCP)_1200 subjects' database in the Amazon Cloud for the determination of signal propagation
- Integration of multimodal neuroimaging (e.g. Diffusion Tensor Imaging-DTI, functional magnetic Resonance Imaging-fMRI) and electrophysiological (e.g. Electroencephalography-EEG) techniques to create a machine learning model of brain functioning
- Creation of a pipeline in the MATLAB environment for the analysis of Arterial Spin Labelling (ASL) signals in both healthy and patients' populations (brain tumor).
- Creation of a pipeline in Unix Shell to analyse Diffusion Tensor Imaging (DTI) data for: Diffusion Weighted Imaging (DWI) denoising and distortion correction, response function estimation, constrained spherical deconvolution, structural connectome construction, etc.
- Simulations of the electric field induced by transcranial magnetic stimulation (TMS) and transcranial direct current stimulation (tDCS) to optimise stimulation protocols through Python's environment.
- Creation of a novel behavioural paradigm to study time perception across age in both healthy and pathological populations.
- Analysis of TMS-EEG data with an automated script in MATLAB for: time series denoising, spectral and rhythmicity analyses, working with complex numbers, filtering, convolution, wavelet analysis, resampling, interpolating, extrapolating, outlier detection, feature detection, variability.
- Conduction of a Meta-Analyses to figure out which is the most efficient intervention (e.g. cognitive training, drugs, non-invasive brain stimulation) to increase human fluid intelligence (gf).
- Creation of a pipeline in Python for the preprocessing and analysis of resting state fMRI data. The script combines several tools coming from different software packages such as Statistical Parameters Mapping (SPM), FSL, AFNI, FreeSurfer.

**Beth Israel Deaconess Medical Center
Harvard Medical School, Boston (MA), USA**

Sept 2016- Sept 2017

Researcher Assistant under the supervision of Alvaro Pascual Leone, MD, Ph.D

Laboratory: -Berenson-Allen Center for Noninvasive Brain Stimulation (BA-CNBS) - Boston

Focus of my Projects:

- Combining Transcranial Magnetic Stimulation (TMS) and EEG in order to study test-rest reliability of plasticity measures.
- Functional Magnetic Resonance Imaging (fMRI) data analysis for resting state functional connectivity and Granger Causality analysis.
- Voxel-based morphometry (VBM) and cortical thickness (CT) analysis to study structural changes induced by first-person action videogame training.
- Multiple regression analysis to establish the predictive power of seed-based connectivity maps I respect to TMS-induced effects.
- Managing and running the TMS clinical service for the treatment of neuropsychiatric patients.
- Perform neuroimaging and behavioural data analysis, quality control checks, compile and maintain research databases, patient files, regulatory binders and study databases.

**Siena General Hospital
University of Siena, Italy**

Sept 2015- Sept 2016

Researcher Assistant under the supervision of Simone Rossi, MD, Ph.D

Laboratory: -Siena Brain Investigation and Neuromodulation Laboratory (SiBIN-Lab) - Siena

Focus of my Projects:

- Integration of Transcranial Magnetic Stimulation (TMS) and neuronavigation systems for cortico-spinal excitability by means of Motor-evoked Potential (MEPs) assessment.
- Implementation of a Dual-coil TMS protocol for the modulation of cortico-cortical connectivity accompanied by multiple evaluations both at behavioural and neuroimaging level.
- fMRI data preprocessing for TMS stimulation site identification based on resting-state connectivity maps.
- Development of cognitive tasks using the E-prime software.
- Development of an ad-hoc visuo-spatial task to assess the impact of adaptive cognitive training in healthy subjects.
- Managing and running repetitive TMS (rTMS) clinical service for the treatment of neuropsychiatric patient (Depression Disorder, Cocaine Addiction, Obsessive-Compulsive Disorder).
- Conduction of clinical and neuropsychological assessments at close with study subjects. Duties included the coordination, administration, scoring and evaluation of study questionnaires/surveys.

**Department of Psychology
Bologna University, Italy**

Sept 2014- Sept 2015

Researcher Assistant under the supervision of Alessio Avenanti, Ph.D

Laboratory: -Centre for studies and research in Cognitive Neuroscience (CsrNC) – Cesena

Focus of my Projects:

- Application of Transcranial Magnetic Stimulation (TMS) to uncover the neural bases of emotion.
- Combining TMS with a priming paradigm (namely TMS-priming) over a right fronto-temporal circuit.
- Application of cortico-cortical Paired Associative Stimulation (cc-PAS) over the visual system, focused on the neural mechanisms underlying social cognition and social behaviour.

PUBLICATIONS:

First author:

1. **Momi, D.**, Wang, Z., Parmigiani, S., Mikulan, E., Bastiaens, S. P., Oveisi, M. P., Kadak, K., Waters, A., Hill, S., Pigorini, A., Keller, C. J., & Griffiths, J. D. (2024). Signal propagation tracking unveils distinct properties of resting-state network dynamics. submitted
2. **Momi, D.**, Wang, Z., Daskalakis, Z. J., Blumberger, D. M., Rajji, T. K., Hill, S., Keller, C. J., Voineskos, D., Zomorodi R., & Griffiths, J. D. (2024). Model-based perturbational neurophysiological biomarkers of iTBS in Treatment-Resistant Depression. submitted
3. **Momi, D.**, Wang, Z., & Griffiths, J. D. (2023). TMS-evoked responses are driven by recurrent large-scale network dynamics. *ELife*, 12, e83232. <https://doi.org/10.7554/eLife.83232>
4. **Momi D**, Neri F, Coiro G, Smeralda C, Veniero D, Sprugnoli G, Rossi A, Pascual-Leone A, Rossi S, Santarnecchi E. 2020. Cognitive Enhancement via Network-Targeted Cortico-cortical Associative Brain Stimulation. *Cereb Cortex N Y N* 1991 30:1516–1527. doi:10.1093/cercor/bhz182
5. **Momi D**, Ozdemir RA, Tadayon E, Boucher P, Di Domenico A, Fasolo M, Shafi MM, Pascual-Leone A, Santarnecchi E. 2021a. Phase-dependent local brain states determine the impact of image-guided TMS on motor network EEG synchronization. *J Physiol n/a*. doi:10.1113/JP282393
6. **Momi D**, Ozdemir RA, Tadayon E, Boucher P, Di Domenico A, Fasolo M, Shafi MM, Pascual-Leone A, Santarnecchi E. 2021b. Perturbation of resting-state network nodes preferentially propagates to structurally rather than functionally connected regions. *Sci Rep* 11:12458. doi:10.1038/s41598-021-90663-z
7. **Momi D**, Ozdemir RA, Tadayon E, Boucher P, Shafi MM, Pascual-Leone A, Santarnecchi E. 2021c. Network-level macroscale structural connectivity predicts propagation of transcranial magnetic stimulation. *NeuroImage* 229:117698. doi:10.1016/j.neuroimage.2020.117698
8. **Momi D**, Smeralda C, Sprugnoli G, Ferrone S, Rossi S, Rossi A, Di Lorenzo G, Santarnecchi E. 2018. Acute and long-lasting cortical thickness changes following intensive first-person action videogame practice. *Behav Brain Res* 353:62–73. doi:10.1016/j.bbr.2018.06.013
9. **Momi D**, Smeralda C, Sprugnoli G, Neri F, Rossi S, Rossi A, Di Lorenzo G, Santarnecchi E. 2019. Thalamic morphometric changes induced by first-person action videogame training. *Eur J Neurosci* 49:1180–1195. doi:10.1111/ejn.14272
10. **Momi D**, Smeralda CL, Di Lorenzo G, Neri F, Rossi S, Rossi A, Santarnecchi E. 2021d. Long-lasting connectivity changes induced by intensive first-person shooter gaming. *Brain Imaging Behav* 15:1518–1532. doi:10.1007/s11682-020-00350-2
11. **Momi D***, Berti B, Sprugnoli G, Neri F, Bonifazi M, Rossi A, Muscettola MM, Benocci R, Santarnecchi E, Rossi S. 2019. Peculiarities of Functional Connectivity—including Cross-Modal Patterns—in Professional Karate Athletes: Correlations with Cognitive and Motor Performances. *Neural Plast* 2019:e6807978. doi:10.1155/2019/6807978
12. **Momi D**, Prete G, Di Crosta A, La Malva P, Palumbo Rocco, Ceccato I, Bartolini E, Palumbo Riccardo, Mammarella N, Fasolo M, Di Domenico A. 2022. Time reproduction, bisection and

doubling: a novel paradigm to investigate the effect of the internal clock on time estimation. Psychol Res. doi:10.1007/s00426-022-01745-0

*Equal contribution

Co-authorships:

13. Bastiaens., S. P., **Momi, D.**, & Griffiths, J. D. (2024). A comprehensive investigation of intracortical and corticothalamic models of alpha rhythms. submitted
14. Morshedzadeh, T., Kadak, K., Bastiaens., S. P., **Momi, D.**, Wang, Z., Harita, S., Jaude, M. A., Aimone, C. A. & Griffiths, J. D. (2024). Neurophysiological modelling in sleep, applied to open datasets and mobile EEG reduced thalamocortical connection strength in deep nREM sleep. submitted
15. Strafella, R., **Momi, D.**, Zomorodi, R., Lissemore, J., Noda, Y., Chen, R., Rajji, T. K., Griffiths, J. D., Vila-Rodriguez, F., Downar, J., Daskalakis, Z. J., Blumberger, D. M., & Voineskos, D. (2023). Identifying Neurophysiological Markers of Intermittent Theta-Burst Stimulation in Treatment-Resistant Depression using Transcranial Magnetic Stimulation-Electroencephalography. *Biological Psychiatry*, 0(0). <https://doi.org/10.1016/j.biopsych.2023.04.011>
16. Lang, S., **Momi, D.**, Vetkas, A., Yang, A., Santyr, B., Kalia, S., Griffiths, J. D. Lozano, A. (2023). Computational modeling of whole-brain dynamics: a review of neurosurgical applications. *Journal of Neurosurgery*. In press
17. Ozdemir RA, **Momi D**, Vink J, Klooster D, Chang B, Pascual-Leone A, Santarnecchi E, Shafi MM. 2023. What do EEG and MRI connectivity measure? Evaluating human brain connectivity with TMS-EEG. *Brain Stimulat* 16:1 198-199. doi:10.1016/j.brs.2023.01.252
18. Boucher PO, Ozdemir RA, **Momi D**, Burke MJ, Jannati A, Fried PJ, Pascual-Leone A, Shafi MM, Santarnecchi E. 2021. Sham-derived effects and the minimal reliability of theta burst stimulation. *Sci Rep* 11:21170. doi:10.1038/s41598-021-98751-w
19. Ceccato I, La Malva P, Di Crosta A, Palumbo R, Gatti M, **Momi D**, Logrieco MGM, Fasolo M, Mammarella N, Borella E, Di Domenico A. 2022. "When did you see it?" The effect of emotional valence on temporal source memory in aging. *Cogn Emot* 36:987–994. doi:10.1080/02699931.2022.2069683
20. Griffiths JD, Wang Z, Ather SH, **Momi D**, Rich S, Diaconescu A, McIntosh RA, Shen K. 2022. Deep Learning-Based Parameter Estimation For Neurophysiological Models Of Neuroimaging Data. *bioRxiv*. doi:10.1101/2022.05.19.492664
21. Harita S, **Momi D**, Mazza F, Griffiths JD. 2021. Mapping inter-individual functional connectivity variability in TMS targets for major depressive disorder. doi:10.1101/2021.07.15.452518
22. Mantovani A, Neri F, D'Urso G, Mencarelli L, Tatti E, **Momi D**, Menardi A, Sprugnoli G, Santarnecchi E, Rossi S. 2021. Functional connectivity changes and symptoms improvement after personalized, double-daily dosing, repetitive transcranial magnetic stimulation in obsessive-compulsive disorder: A pilot study. *J Psychiatr Res* 136:560–570. doi:10.1016/j.jpsychires.2020.10.030
23. Menardi A, **Momi D**, Vallesi A, Barabási A-L, Towlson EK, Santarnecchi E. 2022a. Maximizing brain networks engagement via individualized connectome-wide target search. *Brain Stimulat* 15:1418–1431. doi:10.1016/j.brs.2022.09.011
24. Menardi A, Ozdemir RA, **Momi D**, Tadayon E, Boucher P, Vallesi A, Pascual-Leone A, Shafi MM, santarnecchi E. 2022b. Effect of group-based vs individualized stimulation site selection on reliability of network-targeted TMS. *NeuroImage* 264:119714. doi:10.1016/j.neuroimage.2022.119714
25. Mencarelli L, Menardi A, Neri F, Monti L, Ruffini G, Salvador R, Pascual-Leone A, **Momi D**, Sprugnoli G, Rossi A, Rossi S, Santarnecchi E. 2020. Impact of network-targeted multichannel transcranial direct current stimulation on intrinsic and network-to-network functional connectivity. *J Neurosci Res* 98:1843–1856. doi:10.1002/jnr.24690

26. Mencarelli L, Neri F, **Momi D**, Menardi A, Rossi S, Rossi A, Santarnecchi E. 2019. Stimuli, presentation modality, and load-specific brain activity patterns during n-back task. *Hum Brain Mapp* 40:3810–3831. doi:10.1002/hbm.24633
27. Messa LV, Ginanneschi F, **Momi D**, Monti L, Battisti C, Cioncoloni D, Pucci B, Santarnecchi E, Rossi A. 2019. Functional and Brain Activation Changes Following Specialized Upper-Limb Exercise in Parkinson's Disease. *Front Hum Neurosci* 13:350. doi:10.3389/fnhum.2019.00350
28. Monti L, **Momi D**, Casseri T, Roscio DD, Bellini M, Rossi A. 2021. Comparison of Different Post-Processing Algorithms for Dynamic Susceptibility Contrast Perfusion Imaging of Multiple Sclerosis Lesions: A Time to Peak Analysis. *J Exp Neurol* Volume 2:154–161. doi:10.33696/Neurol.2.049
29. Neri F, Cappa SF, Mencarelli L, **Momi D**, Santarnecchi E, Rossi S. 2021a. Brain Functional Correlates of Episodic Memory Using an Ecological Free Recall Task. *Brain Sci* 11:911. doi:10.3390/brainsci11070911
30. Neri F, Smeralda CL, **Momi D**, Sprugnoli G, Menardi A, Ferrone S, Rossi S, Rossi A, Di Lorenzo G, Santarnecchi E. 2021b. Personalized Adaptive Training Improves Performance at a Professional First-Person Shooter Action Videogame. *Front Psychol* 12.
31. Ozdemir RA, Boucher P, Fried PJ, **Momi D**, Jannati A, Pascual-Leone A, Santarnecchi E, Shafi MM. 2021a. Reproducibility of cortical response modulation induced by intermittent and continuous theta-burst stimulation of the human motor cortex. *Brain Stimulat* 14:949–964. doi:10.1016/j.brs.2021.05.013
32. Ozdemir RA, Tadayon E, Boucher P, **Momi D**, Karakhanyan KA, Fox MD, Halko MA, Pascual-Leone A, Shafi MM, Santarnecchi E. 2020. Individualized perturbation of the human connectome reveals reproducible biomarkers of network dynamics relevant to cognition. *Proc Natl Acad Sci* 117:8115–8125. doi:10.1073/pnas.1911240117
33. Ozdemir RA, Tadayon E, Boucher P, Sun H, **Momi D**, Ganglberger W, Westover MB, Pascual-Leone A, Santarnecchi E, Shafi MM. 2021b. Cortical responses to noninvasive perturbations enable individual brain fingerprinting. *Brain Stimulat* 14:391–403. doi:10.1016/j.brs.2021.02.005
34. Santarnecchi E, Del Bianco C, Sicilia I, **Momi D**, Di Lorenzo G, Ferrone S, Sprugnoli G, Rossi S, Rossi A. 2018a. Age of Insomnia Onset Correlates with a Reversal of Default Mode Network and Supplementary Motor Cortex Connectivity. *Neural Plast* 2018:e3678534. doi:10.1155/2018/3678534
35. Santarnecchi E, **Momi D**, Mencarelli L, Plessow F, Saxena S, Rossi S, Rossi A, Mathan S, Pascual-Leone A. 2021. Overlapping and dissociable brain activations for fluid intelligence and executive functions. *Cogn Affect Behav Neurosci* 21:327–346. doi:10.3758/s13415-021-00870-4
36. Santarnecchi E, **Momi D**, Sprugnoli G, Neri F, Pascual-Leone A, Rossi A, Rossi S. 2018b. Modulation of network-to-network connectivity via spike-timing-dependent noninvasive brain stimulation. *Hum Brain Mapp* 39:4870–4883. doi:10.1002/hbm.24329
37. Santarnecchi E, Sprugnoli G, Tatti E, Mencarelli L, Neri F, **Momi D**, Di Lorenzo G, Pascual-Leone A, Rossi S, Rossi A. 2018c. Brain functional connectivity correlates of coping styles. *Cogn Affect Behav Neurosci* 18:495–508. doi:10.3758/s13415-018-0583-7
38. Sprugnoli G, Monti L, Lippa L, Neri F, Mencarelli L, Ruffini G, Salvador R, Oliveri G, Batani B, **Momi D**, Cerase A, Pascual-Leone A, Rossi A, Rossi S, Santarnecchi E. 2019. Reduction of intratumoral brain perfusion by noninvasive transcranial electrical stimulation. *Sci Adv* 5:eaau9309. doi:10.1126/sciadv.aau9309

RESEARCH FUNDING AND GRANTS

- Discovery Fund 2023 Talent Development Competition: Postdoctoral Fellowship: project “Computational modelling of TMS-EEG brain network dynamics in depression”. 130.000,00 CAD.
- Health Research Call: project “PARXIFAL - Advances in the Discovery of Functional Re-Education in Parkinson Disease. Brain Network, Clinical and Genetic Analysis” (Project's Code B62F20000010002). 600.854,00 euro.

HONORS AND AWARDS:

- Winner of a fellowship (750 EUR) for attending the “1st Summer School of Interdisciplinary Research on Brain Network Dynamic”
- Winner of FENS and IBRO-PERC travel grant (750 EUR) for attending the “International Interdisciplinary Computational Cognitive Science Spring School (IICSSS)”
- Winner of “European Workshop on Cognitive Neuropsychology” Prize for 2019 [\[LINK\]](#)
- University of Bologna Merit Scholarship Recipient: November 2013 – November 2015

PROFESSIONAL PRESENTATIONS:

- July 2023. Symposium Organizer and Speaker at OHBM 2023 - “Recent advances in whole-brain, connectome-based neurophysiological modelling of brain stimulation”
- 12th May 2023. Virtual seminar at our Machine Learning in Medicine webinar series hosted by Cornell University and Weill Cornell Medicine [\[LINK\]](#)
- 6th April 2023. International Network of Neuroimaging Neuromodulation (INNN) [\[LINK\]](#)
- February 2023. The 4th Whistler Scientific Workshop on “Brain Functional Organization, Connectivity, and Behavior. **“Dissecting the spatio-temporal connectivity dynamics of the TMS-induced signal”**
- February 2023. 5th International Brain Stimulation Conference 2023. **“Dissecting the spatio-temporal propagation dynamics of the TMS-induced signal”**
- 1st June 2022. The Neuromodulation and Neuroimaging Relevant to Affective Disorders Speaker Series. **“Dissecting the spatio-temporal propagation dynamics of the TMS-induced signal”**.
- 7th June 2022. Canadian Computational Neuroscience Spotlight conference, Toronto, Canada. **“TMS-evoked responses are driven by recurrent large-scale network dynamics”**
- Dec 2021 Oral talk at 4th International Brain Stimulation Conference 2021, Charleston, South Carolina, USA **“Modelling large-scale brain network dynamics underlying the TMS-EEG evoked response”**
- Dec 2020 Oral talk at Brainhack Marburg **“Brain imaging predicts TMS-induced signal propagation”**
- May 2018 Poster Presentation at the 6th Science Factory: TMS–EEG Summer School and Workshop in Aalto **“Modulation of network-to-network connectivity via spike-timing-dependent noninvasive brain stimulation”**.
- July 2017 Poster Presentation at the “International Society for Intelligence Research” 2017 in Montreal **“Fluid Intelligence Enhancement by means of fMRI-guided Paired-Associative Brain Stimulation”**.

OTHER POSTERS:

- November 2022. Society for Neuroscience Annual Meeting. Momi D, Wang Z, Griffiths JD. **“TMS-evoked responses are driven by recurrent large-scale network dynamics”**
- May 2022. Canadian Association for Neuroscience. Oveisi MP, Clappison AS, Momi D, Griffiths JD. **“Reliability and consistency of diffuse optical tomography resting-state functional connectivity measurements from the Kernel Flow fNIRS system”**.
- May 2022. Canadian Association for Neuroscience. Clappison AS, Wang Z, Oveisi MP, Momi D, Lefebvre J, Fraser M, Griffiths JD. **“Whole-brain connectome-based computational modelling of concurrent resting state electrophysiological and hemodynamic activity”**.
- May 2022. Canadian Association for Neuroscience. Harita S, Momi D, Mazza F, Griffiths JD. **Mapping inter-individual functional connectivity variability in TMS targets for major depressive disorder.**

TEACHING EXPERIENCE

- Organizers of OHBM's Educational Course on "Whole-brain, Connectome-based Models of Brain Dynamics: From Principles to Applications" [\[LINK\]](#)
- BrainHack Summer School TA [\[LINK\]](#)
- KCNI Summer School organizers and TA [\[LINK\]](#)
- BrainHack Toronto organizers and TA [\[LINK\]](#)
- dMRI analysis in Python - Neuroimaging Carpentry, Online [\[LINK\]](#)
- Working with EEG-BIDS in EEGLAB (Matlab) - Neuroimaging Carpentry, Online [\[LINK\]](#)
- Leading TA at Neuromatch Academy 2022

SKILLS:

Technical: Proficient in Microsoft Word, Excel, SPSS, MATLAB, Unix Shell, Python, FreeSurfer, FSL, SPM, AFNI, EEGLAB, Brainstorm, MRtrix3.

- Neuroimaging Data: Analysis of task-based and resting state data by means of different software packages (AFNI, FSL, SPM, FreeSurfer), collection and analysis of data at 3T and 1.5T, event-related and block designs, Volume-based and Surface-based analysis, Non-linear registration in FSL and AFNI, Freesurfer anatomical structural analysis and ROI identification, ANTs N4 bias field correction, Blip-up blip-down distortion correction in AFNI and FSL, Automated fMRI analysis via C shell scripts, Scripting for analysing Diffusion Tensor Imaging in FSL, AFNI and MRtrix3, Constrained Spherical Deconvolution (CSD) to estimate the white matter fibers Orientation Distribution Function (fODF)
- Electrophysiological Data: Data collection, Analysis in the MATLAB toolbox EEGLAB, Automated analysis via scripting in EEGLAB, Skin-conductance collection and analysis, EMG collection and analysis, Time series denoising, Spectral and rhythmicity analyses, working with complex numbers, Filtering, Convolution, Wavelet analysis, Resampling, interpolating, extrapolating, Outlier detection, Feature detection, Variability
- Programming Languages: proficient in MATLAB, Unix Shell, Python, C++
- Brain Stimulation: Cortico-cortical paired associative stimulation application, TMS-EEG data collection, TMS-EEG data preprocessing in EEGLAB by means of a customize script, Source Analysis with Brainstorm, Scripting for the analysis of TMS Evoked Potentials (TEPs), Motor evoked Potentials (MEPs) data collection and analysis.
- Statistical Analysis: proficient in SPSS and R, Mixed linear modelling, Between-subjects, repeated measures and mixed ANOVA, Regression, Structural equation modelling, Correction for multiple comparison in FSL, SPM, AFNI, SPSS, R, Conducting Meta-Analyses using Comprehensive Meta-Analysis Software and Metafor.
- Machine Learning: Linear Regression, Cross Validation and Bias-Variance Trade-Off, Logistic Regression, K Nearest Neighbours, Decision Trees and Random Forests, Support Vector Machines, K Means Clustering, Principal Component Analysis, Natural Language Processing Big Data and Spark with Python Neural Nets and Deep Learning
- Manuscript preparation: compiling literature reviews and references, writing manuscripts and grant proposals, creation of effective, high-resolution data graphics using excel, GIMP, and adobe illustrator
- Data Management: C shell scripting for automated fMRI and EEG data backup

Languages:

Language	Read	Write	Speak	Understand
English	Very good	Very good	Very good	Very good
Italian	Mother tongue	Mother tongue	Mother tongue	Mother tongue
Spanish	Very good	Good	Good	Very good

General: Detail Oriented, Organized, Excellent Writing and Research Skills, Teamwork.

PROFESSIONAL CERTIFICATIONS:

- **“Disruptive Summer School in Data Science & Machine Learning”**
Viterbo, Department of Engineering of the University of Viterbo - Italy
16th-27th September 2019
- **“Summer School in Computational and Theoretical Models in Neuroscience”**
Venice, Padova Neuroscience Center – Italy
9th-14th September 2019
- **“Summer School of Interdisciplinary Research on Brain Network Dynamics”**
Terzolas, Department of Physics of the University of Trento - Italy
24th-28th June 2019
Fellowship Winner
- **“International Interdisciplinary Computational Cognitive Science Spring School (IICSSS)”**
Bernstein Center Freiburg, Germany
25th-31st March 2019
Travel Grant Winner
- **“European Workshop on Cognitive Neuropsychology”**
Forum Center, Bressanone, Italy
20th-25th January 2019
EWCN Prize Winner [\[LINK\]](#)
- **“Neurotechnology applications on aging-related disorders” Winter School**
Cuban Neuroscience Center (CNEURO), Havana, Cuba
26th November -7th December 2018
- **Afni + Suma Training Workshop**
National Institute of Health (NIH), Bethesda (MD), USA
22th-26rd October 2018
- **FreeSurfer Tutorial and Workshop**
Martinos Center for Biomedical Imaging, Boston (MA), USA
1st-4th October 2018
- **6th TMS-EEG Science Factory: TMS-EEG Summer School and Workshop**
Aalto University, Espoo, Finland
18th-23rd May 2018
- **Brainhack San Sebastien**
BCBL – Basque Center on Cognition, Brain and Language, Spain
2nd-4th May 2018
- **20th Natbrainlab Neuroanatomy and Tractography workshop**

Natbrainlab - King's College in London, UK
26th -28th February 2018

- **Intensive Course in Transcranial Magnetic Stimulation**
Berenson-Allen Center for Noninvasive Brain Stimulation, Harvard Medical School, Boston (MA), USA
24th-28th October 2016
- **Introduction to Transcranial Current Stimulation**
Berenson-Allen Center for Noninvasive Brain Stimulation, Harvard Medical School, Boston (MA), USA
31st October -1st November 2016

PROFESSIONAL TITLES

- **Member of the Psychologists Association of Umbria**
Since November 2018
- **Member of "International Society for Intelligence Research"**
Since July 2017
- **Member of "Italian Society of Psychophysiology"**
Since November 2015

EXPERIENCE AND SEMINARS ATTENDANCE

- "Time representation in the brain" - Lecturer: Prof. **Domenica Bueti**, University of Losanne
- "The Basic Emotional Systems and Affective Proto-consciousness" - Lecturer: Prof. **Jaak Panksepp**, Washington State University
- "Performance monitoring and hot cognition" - Lecturer: Prof. **Gilles Pourtois**, Ghent University
- "Attention waxes and wanes depending on mood" - Lecturer: Prof. **Gilles Pourtois**, Ghent University
- "Neural mechanisms of mutual understanding" - Lecturer: Dr. **Arjen Stolk** Donders Centre for Cognitive Neuroimaging Nijmegen, The Netherlands
- "Towards a Neuroscience of free will" - Lecturer: Prof. **Patrick Haggard**, University College of London
- "Neuropsychology of emotions" - Lecturer: Dr. **Marco Tamietto**, University of Turin
- "Visual perception of biological relevant stimuli in pathological and healthy population" - Lecturer: Prof. **Marzia Del Zotto**, Unité de Neuropsychologie, HUG –Hôpitaux Universitaires de Genève
- "Age-related changes in episodic memory and decision-making" - Lecturer: Prof **Julia Spaniol**, Ryerson University, Toronto
- "Functional and structural reorganization in ageing" - Lecturer: Dr. **Hana Burianova**, Centre for Advanced Imaging, University of Queensland
- "From segregation to integration: The complexity of human brain functions" - XXIII Workshop and National Congress of the Italian Society of Psychophysiology (Società Italiana di Psicofisiologia SIPF)

OTHER ACTIVITIES:

Volunteer for "Rafiki Orphanage" (<https://gofund.me/b7ef773d>) [VIDEO](#)

Volunteer for Slums Dunk (<https://www.slumsdunk.org/>)

Volunteer for "Hospice Toronto" (<https://hospicetoronto.ca/>)

Basketball Player Professionals: August 2006 – June 2013

"Italian College Basketball Tour" Company Founder: August 2009– June 2013