UNIVERSITÀ DEGLI STUDI DI MILANO

TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO   ID CODE ____ 5824_____

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di _ Scienze Biomediche e Cliniche 'Luigi Sacco'**_____

Scientist- in - charge: _____ Prof. Marcello Massimini _____

MICHELE COLOMBO

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	COLOMBO
Name	MICHELE
Date of birth	22,11,1988

PRESENT OCCUPATION

Appointment	Structure
PostDoc researcher	Dept. Scienze Biomediche e Cliniche 'Luigi Sacco', via G. B. Grassi 74, 20157 Milano Progetto PerBrain, JPI_MIUR20MROSA_01, with Prof. Mario Rosanova

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement
Bachelor Degree	**Scientific Psychology**, cognitive-psychometric curriculum. **Grade: 110/110**	**Università Vita-Salute San Raffaele**	2010
Erasmus exchange	Faculdad de Psicologia, 66 credits, Exams Grade Point Average: 8.8 /10	**Universidad Autonoma de Madrid**	2009
Master of Science	**Research Master in Neuroscience and Cognition;** Cognitive Neuroscience Track	**Utrecht University**	2014
PhD	**Erasmus Mundi Joint PhD**, Neurotime program, across three universities. Research area: Medical/Neuroscience: Thesis: ''Insomnia Disorder and Endogenous Neurophysiological Dynamics'' **Cum laude**	**Amsterdam, UvA** (prof. Eus van Someren, prof. Andries Kalsbeek) **Basel, Unibas:** (prof. Dominique de Quervain, prof. Christian Cajochen) **Freiburg, ALUF** (prof. Ad Aertsen)	2018

FOREIGN LANGUAGES

Languages	level of knowledge
English	fluent
Spanish	fluent
Dutch	basic

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AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description
2020-2023	**PostDoc grant within ERA PerMed** european grant, "A Multimodal Approach to Personalized Tracking of Evolving State-Of-Consciousness in Brain-Injured Patients (PerBrain)" , "JPI_MIUR20MROSA_01",
2019	**Top 10 most downloaded** open access *NeuroImage* articles in 2019, 2,503 downloads as per 29/1/2020, for: Colombo et al., 2019
2018-2019	**Grant for PostDoc position**, from private foundation Fondazione Confalonieri, via Vincenzo Monti, 25 -20123 Milano
2017-2018	Regional Grant GR-2011-02352031 Project: *'Measures and mechanisms of recovery of consciousness in severely brain-injured patients: a longitudinal multimodal study'*; collaboration with the Neuroreanimation unit from Niguarda Hospital, Milan;
2013-2017	Erasmus Mundi Neurotime grant 520124-1-2011-1-FR-ERA: *'Individual differences in the spatiotemporal profile of brain activity during wake and sleep'*.

TRAINING OR RESEARCH ACTIVITY

Research Assistant @ Neural Oscillation & Cognition, Centre for Neurogenomic & Cognitive Research, Vrije Universiteit Amsterdam, with Dr. Klaus Linkenkaer-Hansen, 2013

PATENTS

Patent 'Method and Apparatus for detecting consciousness'. Submitted to the Patent Commission at the University of Milan: 09/3/2022; Provisional United States patent application 63/366562, 17/6/2022
Co-inventors: Prof. Giulio Tononi, Prof. Christof Koch, Prof. Marcello Massimini, Prof. Silvia Casarotto, Dr. Michele Angelo Colombo

PROJECT ACTIVITY

Year	Project
2017-2023	**EEG signal processing for event-related and ongoing spontaneous activity, related to recovery from loss of consciousness** (physiological, pharmacological and pathological). •**Acquisition and analysis of neurophysiological time-series**: acquisition of EEG signals across set-ups (Nexstim, BrainAmp; low and high-desnity), signal processing (power spectral analysis, entropy indexes, multi-fractal indexes, cross-talk indexes, network analysis with graph-theory indexes) and signal pre-processing (automatic procedures for artifact detection and artifact removal via blind source separation). • **Statistics**: parametric and non-parametric tests, linear mixed effects models, permutation procedures for mass-univariate tests (cluster and threshold-free cluster enhancement), resampling procedures, un/supervised machine-learning approaches for regression and classification. Analysis through custom code and existing libraries in Matlab, Python and R.
2013-2017	**Resting-state EEG individual differences in sleep complaints and insomnia disorder.** Time-series analysis through Matlab inbuilt toolboxes (signal processing, statistics) and EEG-specific toolboxes (fieldtrip, EEGlab, MEEGpipe), R and Python.
2012-2013	**EEG biofeedback design and implementation.** Software design and implementation: 3

		mutually connected programs via TCP ports: BCI200 (data collection and real-time management), Matlab (EEG feature extraction) and MAX/MSP (sound modulations). Real-time feature extraction from EEG for brain computer interfaces (P300 speller) and biofeedback (music fading away with cortical arousal)
2011		**EEG during cross-modal interference task**. Assess bidirectional influences between speech and color processing in synesthesia, acquiring reaction-time and EEG. Use of Matlab and PsychToolBox for stimuli presentation.

SELECTED CONGRESSES

Date	Title	Place
17-18 april 2023	Rest-EEG for DoC diagnosis: alpha power suppression in anoxic patients, altered spatial and spectral gradients in not-anoxic patient, **talk**	PerMed consortium meeting Paris Brain Institute, Sorbonne Universities, Paris, France
7–9 November 2022	An empirical link between the EEG spectral exponent, the complexity of TMS-evoked EEG dynamics and consciousness, across severe brain-injury and anesthesia, poster, available online	Brain Criticality 2022 conference, National Institutes of Health, Bethesda, Maryland, USA
12-15 july 2022	Screening Disorders of Consciousness beyond responsiveness: an informed approach to quantitative EEG , **talk**	ASSC 25, Association for the Scientific Study of Consciousness, Amsterdam
6-7 June, 2019	Using EEG to Identify Conscious Experience Under Anesthesia, **talk**, available online	EEG analytical approached and applications, Virtual Symposium, from Sapien Lab
25-28 September 2018	The Scaling Exponent of the Power Spectrum of the Resting-EEG Indexes the Level of Consciousness during Anesthesia and Sleep, poster	European Sleep Research Society, Basel, Switzerland
26-29 June 2018	Consciousness and spectral features in anesthesia and sleep, **talk**	Sleep-dreams session @Association for Scientific Study of Consciousness, Krakow, Poland
31 October- 3 November 2015	Electroencephalographic spatiospectral Signatures of Insomnia, poster	World Sleep Congress, Istanbul, Turkey
16-20 September 2014	Power Spectral Analysis in Insomnia, poster	European Sleep Research Society conference, Tallinn, Estonia
29-31 May 2012	Towards a sleep biofeedback protocol: comparison of EEG biomarkers, poster	Dutch EndoNeuroPsycho meeting, Lunteren, The Netherlands
12-13 April 2011	Cross-modal interference in grapheme color synesthesia: EEG recording during fast recognition of spoken graphemes and visual color, poster	Mind the Brain, UMC Utrecht, the Netherlands

SELECTED PUBLICATIONS

Peer reviewed Scientific Articles	Citations	year
Favaro, J., **Colombo, M. A.**, Sartori, S., Nosadini M., Ruzzante S., Sarasso, S., Toldo, I., Massimini, M. (2023) The maturation of aperiodic EEG activity across development	0, in press	2023

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reveals a progressive differentiation of wakefulness from sleep. *Neuroimage* (120264, ISSN 1053-8119, 4) **(Co-first author)**	1/7/23	
Colombo, M. A., Comanducci, A., Casarotto, S., Derchi, C. C., Annen, J., Viganò, A., ... & Rosanova, M. (2023). Beyond alpha power: EEG spatial and spectral gradients robustly stratify disorders of consciousness. *Cerebral Cortex*, 33(11), 7193-7210.	1	2023
Willacker, L., Raiser, T. M., Bassi, M., Bender, A., Comanducci, A., Rosanova, M., N. Sobel, A. Arzi, L. Belloli, S. Casarotto, M. A. Colombo,... & Sitt, J. D. (2022). PerBrain: a multimodal approach to personalized tracking of evolving state-of-consciousness in brain-injured patients: protocol of an international, multicentric, observational study. *BMC neurology*, 22(1), 1-11.	2	2022
Lanzone, J., Colombo, M. A., Sarasso, S., Zappasodi, F., Rosanova, M., Massimini, M., ... & Assenza, G. (2022). EEG spectral exponent as a synthetic index for the longitudinal assessment of stroke recovery. *Clinical Neurophysiology*, 137, 92-101.	16	2022
Colombo, M. A., Napolitani, M., Boly, M., Gosseries, O., Casarotto, S., Rosanova, M., ... & Massimini, M. (2019). The spectral exponent of the resting EEG indexes the presence of consciousness during unresponsiveness induced by propofol, xenon, and ketamine. *NeuroImage*, *189*, 631-644.	**168**	2019
Colombo, M. A., Ramautar, J. R., Wei, Y., Gomez-Herrero, G., Stoffers, D., Wassing, R., ... & Van Someren, E. J. (2016). Wake high-density electroencephalographic spatiospectral signatures of insomnia. *Sleep*, 39(5), 1015-1027.	54	2016
Colombo, M. A., Wei, Y., Ramautar, J. R., Linkenkaer-Hansen, K., Tagliazucchi, E., & Van Someren, E. J. (2016). More severe insomnia complaints in people with stronger long-range temporal correlations in wake resting-state EEG. *Frontiers in physiology*, 7, 576.	30	2016
Wei, Y., Colombo, M. A., Ramautar, J. R., Blanken, T. F., Van Der Werf, Y. D., Spiegelhalder, K., ... & Van Someren, E. J. (2017). Sleep stage transition dynamics reveal specific stage 2 vulnerability in insomnia. *Sleep*, 40(9). (Co-first author)	47	2017
Wei, Y., Ramautar, J. R., Colombo, M. A., Te Lindert, B. H., & Van Someren, E. J. (2018). EEG microstates indicate heightened somatic awareness in insomnia: Toward objective assessment of subjective mental content. *Frontiers in psychiatry*, 9, 395.	23	2018
Wei, Y., Ramautar, J. R., Colombo, M. A., Stoffers, D., Gómez-Herrero, G., Van Der Meijden, W. P., ... & Van Someren, E. J. (2016). I keep a close watch on this heart of mine: increased interoception in insomnia. *Sleep*, 39(12), 2113-2124.	58	2016

OTHER INFORMATION

Research Gate profile: https://www.researchgate.net/profile/Michele_Colombo2
Google Scholar profile: https://scholar.google.com/citations?user=O8uktnAAAAAJ&hl=en
Google Scholar metrics: Citations: 456   h-index: 9   i-10-index: 9

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Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Place and date: ___Milano_____, ____3/7/2023_____

SIGNATURE