

Marta Castellano, PhD

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EMPLOYMENT AND RESEARCH POSITIONS

Neuroelectrics, Barcelona — *Clinical Research Manager*

JANUARY 2020 - PRESENT

- Coordination of clinical investigations through their complete lifecycle, ensuring quality and compliance with required GCP.
- Oversight of clinical protocol development, including the statistics.
- Statistical analysis of clinical studies outcomes.

Universitat Internacional de Cat., Barcelona — *Assistant professor*

SEPTEMBER 2021 - FEBRUARY 2022

Universitat Politecnica de Catalunya, Barcelona — *Assistant professor*

JUNE 2018 - FEBRUARY 2021

Starlab SL, Barcelona — *Project Manager and Senior Researcher in applied Neurosciences*

JUNE 2015 - JANUARY 2020

- Develop methodologies to apply machine learning algorithms to detect complex pathologies, focusing on Parkinson's, Alzheimer's, and ALS
- Lead POCs for medical decision support systems with the goal of creating new business lines and entering new markets (ADHD, Obesity among others).
- Project/proposal writing and project management for EU and private funds.
- Design and oversight of EEG and tCS-EEG clinical protocols.

Institute of Cognitive Science, Osnabrück — *Graduate student*

JANUARY 2011 - SEPTEMBER 2014

- Computational modeling of biologically inspired neural networks for studying self-organization principles in the brain.

Max Planck Institute for Brain Research, Frankfurt — *Research Assistant*

OCTOBER 2008 - DECEMBER 2011

- Studied computational models of biologically inspired neural networks and plasticity mechanisms.

Department of Psychology at University of Vic, Vic — *Research Assistant*

DECEMBER 2007 - FEBRUARY 2008

National Center for Biological Sciences, Bangalore — *Research Assistant*

JUNE 2007 - OCTOBER 2007

Bank for Genetic Resources at University of Vic, Vic — *Research Assistant*

FEBRUARY 2004 - FEBRUARY 2007

EDUCATION HISTORY

PGCert in Persuasive Communication, University of Barcelona — *Faculty of Economy and Business*

OCTOBER 2016 - JUNE 2017

PhD in Neuroinformatics, University of Osnabrück — *Institute of Cognitive Sciences*

QUALIFICATION: Magna Cum Laude

TITLE: Computational Principles of Neural Processing: modulating neural systems through temporally structured stimuli

SUPERVISOR: Prof. Gordon Pipa

OCTOBER 2010 - JUNE 2014

MSc Computational Sciences, Goethe Universität — *Faculty of Physics*

RANK: 3rd of 6

OCTOBER 2008 - OCTOBER 2010

BSc Biotechnology, University of Vic — *Faculty of Sciences and Technology*

RANK: 1st of 82

SEPTEMBER 2004 - JUNE 2008

SKILLS

Languages:

English · Catalan · Spanish

Programming languages:

Matlab, R, Python, Perl, SPSS

SCIENTIFIC REFEREE ACTIVITIES

- Frontiers in Neurosciences
- ICANN: International Conference on Artificial Neural Networks
- BICA: Biologically Inspired Cognitive Architectures

SELECTED PUBLICATIONS

Castellano, M., Ibañez-Soria, D., Kroupi, E., Acedo, J., Campolo, M., Soria-Frisch, A., ... & Ruffini, G. (2020). Intermittent tACS during a visual task impacts neural oscillations and LZW complexity. *Experimental Brain Research*, 238(6), 1411-1422.

This paper analyses the impact of transcranial alternating current stimulation (tACS) on the visual system and its interaction with a speed-detection task. tACS is discussed from the perspective of using perturbation-based metrics to probe neural mechanisms of cognition. This research was developed as a part of a collaboration with a pharma company in a funding scheme of b2b.

Ruffini, G., Ibañez, D., **Castellano, M.,** Dubreuil-Vall, L., Soria-Frisch, A., Postuma, R., ... & Montplaisir, J. (2019). Deep learning with EEG spectrograms in rapid eye movement behavior disorder. *Frontiers in neurology*, 10, 806.

This publication is associated with a multicentre study founded by the Michael J. Fox Foundation that required clinical data integration from 6 centers across Europe, in an attempt to apply state-of-the-art algorithms to predict the onset of Parkinson's disease. Associated peer-reviewed journal publications and conference proceedings are listed below:

- Ruffini, G., Ibanez, D., Castellano, M., Dunne, S., & Soria-Frisch, A. (2016). EEG-driven RNN classification for prognosis of neurodegeneration in at-risk patients. In *Artificial Neural Networks and Machine Learning-ICANN 2016: 25th International Conference on Artificial Neural Networks*, Barcelona, Spain, September 6-9, 2016, Proceedings, Part I 25 (pp. 306-313). Springer International Publishing.
- Ruffini, G., Ibañez, D., Kroupi, E., Gagnon, J. F., Montplaisir, J., Postuma, R. B., ... & Soria-Frisch, A. (2019). Algorithmic complexity of EEG for prognosis of neurodegeneration in idiopathic rapid eye movement behavior disorder (RBD). *Annals of biomedical engineering*, 47, 282-296.

Castellano, M., Cuenca-Royo, A., Forcano, L., Soria-Frisch, A., Ruffini, G., & de la Torre, R. (2017). New approaches for the treatment of morbid obesity: tDCS plus Cognitive Training (CT), a pilot study. *Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation*, 10(2), 459-460.

This publication has been selected because exemplifies the clinical use of tCS-EEG. This research was conducted as part of the Innobrain project (as WP6 coordinator), part of the NextHeath-RIS3CAT community - an initiative financed by ACCIÓ and the European Regional Development Fund (ERDF) from the European Union.

Castellano, M., Plöchl, M., Vicente, R., & Pipa, G. (2014). Neuronal oscillations form parietal/frontal networks during contour integration. *Frontiers in integrative neuroscience*, 8, 64.

The work presented in this paper was part of my PhD thesis, where GLM was used as a predictive model to decode the content of the visual system (EEG) while participants were involved in a contour integration task. Associated peer-review conference proceedings and posters related to this research are listed below:

- Castellano, M., Plöchl, M., Vicente, R., & Pipa, G. (2014) Static vs Dynamic Contour Integration: When Timing Matters. OCCAM: Osnabruck Computational Cognition Alliance Meeting.
- Castellano, Marta, Raul Vicente, and Gordon Pipa. (2015). GLM-based decoding of contour classification from EEG signals. *PERCEPTION*. Vol. 44.
- Boelts, J., Castellano, M., Pipa, G. (2016) Online Decoding of Contour Perception through EEG. Third HBP Education Workshop.

Scheller, B., **Castellano, M.,** Vicente, R., & Pipa, G. (2011). Spike train auto-structure impacts post-synaptic firing and timing-based plasticity. *Frontiers in Computational Neuroscience*, 5, 60.

This first journal publication presented a computational model of a single neuron to study how neurons extract information from the temporal structure of spikes and proposes a possible role in the speed of learning. This research was conducted as part of the PHOCUS project and thus, as a contribution to a project funded by the FP7 framework (FP7-ICT-2009-C). Since then, other publications (see CV) have appeared associated with the following H2020 projects: STIPED, LUMINOUS.

SUMMARY OF SCIENTIFIC PUBLICATIONS

Google Scholar Profile - [here](#).

Peer-reviewed publications: 23

Conference Proceedings: 7

Book chapters: 1

AWARDS

Institution: University of Vic

- Merit: 1st of the BsC promotion
- Year: 2014

SCHOLARSHIPS

Funding body: ZKfG - Pool Frauenförderung

- Aim: Finalizing PhD
- Period covered: 2014
- Institution: Osnabrück Universität

Funding body: Caixa Manresa

- Aim: Research internship
- Period covered: 2007
- Institution: University of Vic

PARTICIPATION IN PUBLICLY FUNDED RESEARCH PROJECTS

Project title: Galvani: Controlling epileptic brain networks with computationally optimized weak electric fields
Funding body: H2020 Call for participation reference: ERC-2019-SyG
Funding period: 2021-2027 Project coordinator(s): Giulio Ruffini, Neuroelectrics; Fabrice Wendling INSERM; Fabrice Bartolomei, AMU

Project title: Neurotwin: Digital twins for model-driven non-invasive electrical brain stimulation
Funding body: H2020 Call for participation reference: H2020-FETPROACT-2018-2020
Funding period: 2021-2025 Project coordinator: Giulio Ruffini, Neuroelectrics

Project title: STIPED: Stimulation in Pediatrics
Funding body: H2020 Call for participation reference: SC1-2016-RTD
Funding period: 2017-2021 Project coordinator: David Ibañez, Starlab

Project title: Innobrain: Noves tecnologies per a la innovació en rehabilitació i estimulació cognitiva
Funding body: ACCIO - Fons FEDER Call for participation reference: Comunitats Risc3Cat
Funding period: 2017-2020 Project coordinator: Marta Castellano, Starlab

Project title: Luminous: Studying, Measuring and Altering Consciousness through information theory in the electrical brain
Funding body: H2020 Call for participation reference: Fet Open
Funding period: 2016-2020 Project coordinator: Aureli Soria-Frisch, Starlab

Project title: PHOCUS: Towards a PHOtonic liquid state machine based on delay-CoUpled Systems
Funding body: FP7 Call for participation reference: ICT-2007-240763
Funding period: 2010-2012 Project coordinator: Claudio Mirasso, IFISC

Project title: GABA: Global approach to brain activity: From cognition to disease
Funding body: FP6 Call for participation reference: NEST-Path-043309
Funding period: 2007-2009 Project coordinator: Emilio Hernández-García, IFISC

PARTICIPATION IN PRIVATELY FUNDED RESEARCH and TECHNOLOGY TRANSFER PROJECTS

Project title: FEXO Robotic exoskeleton for motor rehabilitation in neurological patients with upper limb motor deficit
Funding body: H2020 Call for participation reference: Pre-Commercial Procurement (PCP)
Funding period: 2018-2019 Project coordinator: Aureli Soria-Frisch, Starlab

Project title: UpAkili: neural markers of gaming
Funding company/administration: Akili Country: USA
Funding period: 2017-2018 Project manager: Marta Castellano, Starlab

Project title: Multi-center Study of EEG biomarkers for alpha-Synucleinopathy Diagnosis and Prognosis Decision Support Tools based on Machine Learning
Funding company: Michael J Fox Foundation Country: USA
Funding period: 2016-2018 Project manager: Aureli Soria-Frisch, Starlab

Project title: Experimental setup - see your brain while participating in a scientific experiment
Funding company: Cosmo Caixa Country: Spain
Funding period: 2017-2018 Project manager: Marta Castellano, Starlab

Project title: Givaudan: neural bases of odor preferences
Funding company/administration: Givaudan Country: Spain
Funding period: 2016-2017 Project manager: Javier Acedo, Starlab

Project title: Brain Polyphony: Neurosonification of EEG signals as a tool for diagnosis and rehabilitation in motor and/or cognitive disabled patients
Funding company/administration: 4th CRG Call on Emergent Translational Research Grants
Funding period: 2016-2017 Country: Spain
Project manager: Mara Dierssen, CRG

Project title: Starprobe -biomarkers of tCS stimulation
Funding company/administration: Biogen Country: USA
Funding period: 2015-2016 Project manager: David Ibañez Soria, Starlab

Project title: Sonification of brain waves, from brain electrophysiological activity to music with emotional content
Funding company/administration: CCCB Country: Spain
Funding period: 2015-2016 Project manager: Aureli Soria-Fisch, Starlab

INVITED TALKS

2018 - NE workshop on new technologies for tCS. Barcelona, Spain
2016 - 1st SINC2 Workshop, Barcelona, Spain
2016 - Barcsyn 2016: Barcelona Computational, Cognitive and Systems Neuroscience, Spain
2015 - Barcsyn 2015: Barcelona Computational, Cognitive and Systems Neuroscience, Spain
2015 - Gatsby Computational Neuroscience Unit, London, UK
2015 - StarLab, Barcelona, Spain
2015 - Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), Barcelona, Spain
2013 - 23rd International Conference on Artificial Neural Networks (ICANN), Sofia, Bulgaria

SELECTED CONFERENCES AND WORKSHOPS

2018 - Organizer and Speaker - NE workshop on new technologies for tCS. Barcelona, Spain
2017 - Poster presentation - 3rd Brain Stimulation Conference. Barcelona, Spain
2016 - Special Session Organizer - 25th International Neuroinformatics Coordinating Facility Congress (INCF). Barcelona, Spain
2016 - Invited Teacher Assistant - CAMP: Computational Approaches to Memory and Plasticity summer school. Bangalore, India
2012 - INCF training course on "Advanced Statistical Modelling of Neuronal Data". Osnabrück, Germany
2011 - Workshop on Learning and Plasticity at the CIRM, Marseille, France.
2010 - Brain Clocks and Rhythms Summer School, Santiago de Chile, Chile.
2009 - Trends in Complex Systems. International Workshop on Synchronization and Multiscale Complex Dynamics in the Brain (BSYNC09), Dresden, Germany

THESIS SUPERVISED

MSC STUDENTS:

2018 - Georgina Campany. EEG correlates of cognitive training in MO patients
2017 - Maria Kesa. Motor action in SOC networks, a reward-modulated mechanism?
2014 - Ernesto Lopez Montesinos. Modeling Local Field Potential through delayed dynamical systems.

BSC STUDENTS:

2014 - Jan Böltz. On-line decoding of visual perception through EEG.
2013 - Felix Breuninger. Social games in virtual reality.
2012 - Alex Meier. Multi-scale Reservoir Computing Using SORN and Mackey-Glass Systems.
2011- Sarah Schaechtelin. Computational performance and memory capability in a liquid state machine using a critical reservoir.

TEACHING

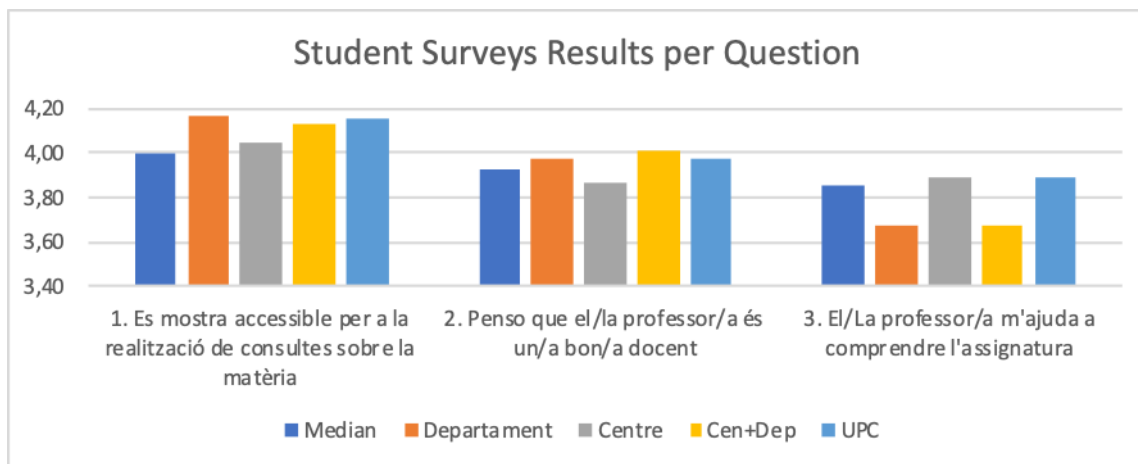
LECTURES:

<i>Program</i>	<i>Year</i>	<i>Cycle</i>	<i>Course</i>	<i>Institution</i>	<i>Imparted Credits</i>	<i>Theory vs Practice</i>
Master in Cognitive Sciences	2013 - 2014	MSc	Decoding Neuronal Activity	University of Osnabrück	4	T, P
Master in Cognitive Sciences	2011 - 2012	MSc	Modelling with Spiking Neurons	University of Osnabrück	4	T, P
Computational Approaches to Memory and Plasticity	2016- 2017	BSc, MSc, PhD	Introduction to Machine Learning	National Center for Biological Sciences	2	T, P
Industrial Engineering	2018 - 2019	BSc	Statistics	Universitat Politècnica de Catalunya	3	P
Master in Innovation and Research in Informatics	2018-2019	MSc	KLMM: Kernel-Based Machine Learning and Multivariate Modelling	Universitat Politècnica de Catalunya	3	T, P
Bachelor's degree in Biomedical Science	2021-2022	BSc	Biotechnology	Universitat Internacional de Catalunya	5	T

TEACHING PHILOSOPHY:

Statistics, as many other STEM disciplines, has a dichotomy – while its application requires a deep theoretical understanding of the subject, the intuitions on how to leverage the understanding only comes after learning in practice. To bridge the STEM gap, my teaching aims to give students the exposure to solve problems (while exploring the technical and mathematical aspects of a topic) by bringing into the class context their motivation to learn, a skill that I've developed through past lectures and by continuous education (see CV, Postgraduate Degree in Persuasive Communication by UB). During my years of teaching experience, I've also had the chance of developing and adapting course materials (for both BSc and MSc) – which I am looking forward to continuing to do. In these regards, as a teacher, my goal is to take advantage of technology by providing access to code and lecture notes, as well as complementary teaching materials that may benefit their learning. My lecture notes themselves contain supplementary lecture notes for those students who want to further their knowledge online.

STUDENT EVALUATIONS (UPC):



DECLARACIÓ JURADA

En relació a: resolució núm. 049_SPDI_CONCURSOS_2023-668/11 d'1 de març, per la qual es convoquen els processos selectius per a la contractació de professorat lector.

A qui li sigui d'interès,

Jo, Marta Castellano Palomino, amb el DNI 47895154T, declara que els fets que figuren en l'historial acadèmic i professional, i tots els documents adjunts a la sol·licitud de treball són fets autèntics al millor del meu coneixement.

Marta Castellano.