Curriculum Vitae

Marco Roccato

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CURRENT POSITION

Graduate Teaching Assistant
Department of General Psychology, University of Padova
- Teaching (15 hours): *Psychology of Sensory Processes* (Prof. Gianluca Campana) in Bachelor's Degree Course in Cognitive and Psychobiological Psychological Sciences
- Teaching (15 hours): *Psychology, Aesthetics and Art* (Prof. Marco Bertamini) in Master's Degree Course in Applied Cognitive Psychology

Graduate Visitor
Department of General Psychology, University of Padova
- Supervision of intern students in laboratory activities: experimental data collection using the BrainSTIM stimulator to deliver transcranial random-noise stimulation (tRNS) for the project *Visual perceptual learning transfer in an orientation discrimination task using high-frequency transcranial random noise stimulation*

EDUCATION

2021 – 2024 **PhD Student in Brain, Mind and Computer Science**
University of Padova
Thesis: *How regularities shape visual perception: aesthetic preferences, form discrimination, and geometric hallucinations*
Supervisor: Prof. Gianluca Campana
Co-supervisor: Prof. Lamberto Ballan

2017 – 2020 **Master's Degree in Neuroscience and Neuropsychological Rehabilitation (Laurea Magistrale in Neuroscienze e Riabilitazione Neuropsicologica – LM-51)**
University of Padova
Admission ranking: 15th on 301 applicants
Thesis: *Poisoned Mind: Toxicants and Behavior*
Supervisor: Prof. Peter Kramer
Co-supervisor: Prof. Paola Bressan
Final grade: 110/110 *cum laude,* obtained on 16/10/2020

2014 – 2017 **Bachelor's Degree in Cognitive and Psychobiological Psychological Sciences (Laurea Triennale in Scienze Psicologiche Cognitive e Psicobiologiche – L-24)**
University of Padova
Thesis: *Hormesis in Combating Neurodegenerative Disease*
Supervisor: Prof. Peter Kramer
Co-supervisor: Prof. Paola Bressan
Final grade: 110/110 *cum laude,* obtained on 25/09/2017

VISITING RESEARCH POSITIONS

02/2019 – 07/2019 **Visiting PhD Student**
Dugué Lab within the Integrative Neuroscience and Cognition Center (INCC), Université Paris Cité, CNRS, Paris, France
PI: Prof. Laura Dugué
I spent two separate research periods of 6 and 2 months at Dugué Lab under direct supervision of Prof. Laura Dugué, engaging in the following activities as part of my PhD project on flicker-induced hallucinations:

- Attendance and delivery of scientific presentations both within Dugué Lab and for a weekly seminar series held by the Vision Group (https://incc-paris.fr/vision/) of the INCC, participating in discussions on experimental design and data analysis
- Electroencephalography (EEG) (ActiChamp - 64 electrodes)
- Use of DLP4710EVM-LC 1440Hz projector (Texas Instruments)
- Use of Photo Sensor (BrainVision)
- Eye-tracking (Eyelink 1000)
- Python programming for building experimental scripts and set up Eyelink 1000 integration, using PsychoPy software
- Python programming for building EEG analysis pipelines, using the MNE Python Library for MEG and EEG analysis and visualization

- R programming for behavioral data analysis acquired using an experimental psychophysical paradigm
- Active screening and recruitment of participants in experiments
- Scheduling of experimental sessions and lab calendar management
- Management of experimental room and lab equipment

RESEARCH INTERNSHIPS

07/2020 – 07/2021 **Post-graduate Internship for State Examination (1000 hours)**
Department of General Psychology, University of Padova
Supervisor: Prof. Gianluca Campana
Projects: Development of a tutorial for students on how to design web-based experiments; programming and implementation of web-based experiments, data collection, and analysis.
At the end of my internship, I passed the State Examination for Professional Qualification as Psychologist.

02/2019 – 07/2019 **Master's Level Internship - Erasmus Traineeship Program**
German Center for Vertigo and Balance Disorders, University Hospital, Ludwig-Maximilians-Universität München (LMU), München, Germany
Supervisor: Prof. Paul C.J. Taylor
Project: *Reducing variability of perceptual decision making with offline theta-burst TMS of dorsal medial frontal cortex*
Techniques:
- Electroencephalography (EEG) (ActiCAP)
- Neuronavigation (Brainsight)
- Transcranial Magnetic Stimulation (TMS) (MagPro X100)

02/2017 – 06/2017 **Bachelor's Level Internship**
Neuroscience of Movement Laboratory (NeMo Laboratory), Department of General Psychology, University of Padova
Supervisor: Prof. Luisa Sartori
Project: *Gaze and body cues interplay during interactive requests*
Techniques:
- Electromiography (EMG)
- Transcranial Magnetic Stimulation (TMS) (MagStim)
- 3D Motion Tracking

PUBLICATIONS

Roccato, M., Contemori, G., Campana, G., & Bertamini, M. (2024). Explicit and Implicit Preference for Symmetry Across Object Categories. *Symmetry*, *16*(11), 1478. https://doi.org/10.3390/sym16111478

Donato, R., Contillo, A., Campana, G., **Roccato, M.**, Gonçalves, Ó. F., & Pavan, A. (2024). Visual Perceptual Learning of Form–Motion Integration: Exploring the Involved Mechanisms with Transfer Effects and the Equivalent Noise Approach. *Brain Sciences*, *14*(10), 997. https://doi.org/10.3390/brainsci14100997

Roccato, M., Campana, G., Vicovaro, M., Donato, R., & Pavan, A. (2024). Perception of complex Glass patterns through spatial summation across unique frames. *Vision Research*, *216*, 108364. https://doi.org/10.1016/j.visres.2024.108364

Makin, A. D. J., **Roccato, M.**, Karakashevska, E., Tyson-Carr, J., & Bertamini, M. (2023). Symmetry Perception and Psychedelic Experience. *Symmetry*, *15*(7), 1340. https://doi.org/10.3390/sym15071340

Willacker, L., **Roccato, M.**, Can, B. N., Dieterich, M., & Taylor, P. C. (2020). Reducing variability of perceptual decision making with offline theta-burst TMS of dorsal medial frontal cortex. *Brain Stimulation*, *13*(6), 1689–1696. https://doi.org/10.1016/j.brs.2020.09.011

In preparation:

Do musicians have better short-term memory than nonmusicians? A multi-lab study (Grassi et al.)
https://osf.io/69gzf

Frequency of luminance flicker drives discriminability of form cues in ambiguous Glass patterns (Roccato, M., Petras, K., Campana G., Dugué L.)

PRESENTATIONS

Accepted abstract for poster presentation entitled *Visual perceptual learning transfer in an orientation discrimination task using high-frequency transcranial random noise stimulation* – 2025 International Brain Stimulation Conference in Kobe, Japan (planned for 23–26 February 2025)

Poster presentation entitled *Boosting transfer in perceptual learning using transcranial random noise stimulation* – 2024 European Conference on Visual Perception (ECVP) in Aberdeen, UK

Poster presentation entitled *Frequency of luminance flicker drives discriminability of form cues in ambiguous Glass patterns* – 2024 Behavioral Neuroscience Conference in Rome, Italy

Poster presentation entitled *Explicit and Implicit Preference for Symmetry Across Object Categories* – 2024 International Association of Empirical Aesthetics (IAEA) in Palma, Spain

Poster presentation entitled *Visual Aversive Learning Does Not Compromise Sensory Discrimination* – 2023 European Conference on Visual Perception (ECVP) in Paphos, Cyprus

Poster presentation entitled *Spatial and temporal summation drive the perception of complex Glass patterns* – 2022 European Conference on Visual Perception (ECVP) in Nijmegen, Netherlands

Talk entitled *Looking for the Looking Glass: Mirror and Reflection Detection in Paintings*– 2022 Visual Properties Driving Visual Preference (VPVDP) workshop in Padova, Italy

GRANTS AND AWARDS

Travel Grant (1000 EUR) awarded by the International Empirical Aesthetics Association (IAEA) for attending the 2024 Biennial Congress of the International Association of Empirical Aesthetics in Palma, Spain (08-10 May 2024).

COLLABORATIONS

Ongoing collaboration relations with:

- Prof. Gianluca Campana (University of Padova): wide range of projects on low-level visual perception with and without non-invasive brain stimulation techniques (NIBS);
- Prof. Marco Bertamini (University of Padova): empirical aesthetics projects on symmetry perception and art perception;
- Prof. Luca Battaglini (University of Padova): project on plant awareness disparity (PAD);
- Prof. Andrea Pavan (University of Bologna): project involving the use of high-frequency transcranial random-noise stimulation (tRNS) with a BrainSTIM stimulator for improving transfer in visual perceptual learning (VPL);
- Prof. Laura Dugué and Dr. Kirsten Petras (Université Paris Cité): project focused on developing a novel psychophysical paradigm for investigating flicker-induced hallucinations and their electroencephalographic (EEG) correlates.

Participation in the following international multi-lab research project:
Do musicians have better short-term memory than nonmusicians? A multi-lab study [Accepted stage 1 registered report https://osf.io/69gzf] with Professors Massimo Grassi and Barbara Carretti (Università di Padova), Elvira Brattico and Peter Vuust (Aarhus University), Francesca Talamini and Marcel Zentner (University of Innsbruck), Barbara Tillmann (CNRL, Lyon), Anne Caclin (CRNL, INSERM, Lyon), Laura Ferreri (Université Lumière Lyon 2), Jonathan Wilbiks

(University of New Brunswick), Swathi Swaminathan and Jessica Grahn (Western University), Antoni Rodriguez-Fornells (University of Barcelona). My contribution in this project involved both developing a part of the experimental tasks using the JavaScript library JsPsych (https://www.jspsych.org/latest/) and the JATOS hosting service (https://www.jatos.org/), and preparing data wrangling scripts for sanity checks in R with RStudio.

I regularly attend laboratory meetings both in Prof. Campana's and Prof. Bertamini's laboratories. I also regularly attend the PercUP (PERCeption GroUP) seminar series, for which in 2023 I invited two PhD students at Dugué Lab (Université Paris Cité, Paris, France) to give the following talks:

- Dr Laurie Galas (Université Paris Cité, France): *Attention Rhythmically Shapes Sensory Tuning*
- Dr João Cardoso (Université Paris Cité, France): *Modeling the Role of Perceptual Waves during Binocular Rivalry*

TEACHING EXPERIENCES

a.a. 2024/2025 **Invitation to hold seminars**
I sem. (ongoing) - *Top-Down Visual Processes and Hallucinations*
- *Hallucinations Induced by Flickering Light*
Degree course: Bsc in Cognitive and Psychobiological Psychological Sciences

a.a. 2024/2025 **Graduate Teaching Assistant** (15 hours)
I sem. (ongoing) Teaching: *Psychology of Sensory Processes* (Prof. Gianluca Campana).
Degree course: Bsc in Cognitive and Psychobiological Psychological Sciences

a.a. 2024/2025 **Graduate Teaching Assistant** (15 hours)
I sem. (ongoing) Teaching: *Psychology, aesthetics and art* (Prof. Marco Bertamini).
Degree course: Msc in Applied Cognitive Psychology

a.a. 2023/2024 **jsPsych Seminar** (20 hours, class-based) – Advanced Courses for Scientific Research: CARS (Corsi Avanzati per la Ricerca Scientifica) – Department of General Psychology
Hands-on training in creating web-based psychology experiments with JavaScript library jsPsych. Held for an audience of 10 students, the seminar covered the library's core functions, experimental design, data collection, and hosting of web-based experiments. By the end, participants were able to independently program basic experimental tasks in jsPsych.

a.a. 2023/2024 **Graduate Teaching Assistant** (15 hours)
I sem. Teaching: *Psychology of Sensory Processes* (Prof. Gianluca Campana).
Degree course: Bsc in Cognitive and Psychobiological Psychological Sciences

a.a. 2022/2023 **Graduate Teaching Assistant** (20 hours)
I sem. Teaching: *Psychology of Sensory Processes* (Prof. Gianluca Campana).
Degree course: Bsc in Cognitive and Psychobiological Psychological Sciences

a.a. 2022/2023 **Graduate Teaching Assistant** (15 hours)
I sem. Teaching: *Psychology, aesthetics and art* (Prof. Marco Bertamini).
Degree course: Msc in Applied Cognitive Psychology

a.a. 2021/2022 **jsPsych Seminar** (20 hours, class-based) – Advanced Courses for Scientific Research: CARS (Corsi Avanzati per la Ricerca Scientifica) – Department of General Psychology

a.a. 2021/2022 **Graduate Teaching Assistant** (20 hours)
II sem. Teaching: *Psychology of Perception* (Prof. Gianluca Campana).
Degree course: Bsc in Cognitive and Psychobiological Psychological Sciences

a.a. 2021/2022 **Graduate Teaching Assistant** (15 hours)
I sem. Teaching: *Psychology, aesthetics and art* (Prof. Marco Bertamini).
Degree course: Msc in Applied Cognitive Psychology

a.a. 2020/2021 **jsPsych Seminar** (20 hours, online-based) – Advanced Courses for Scientific Research: CARS (Corsi Avanzati per la Ricerca Scientifica) – Department of General Psychology

a.a. 2020/2021 **Graduate Teaching Assistant** (10 hours)
II sem. Teaching: *Psychology of Perception* (Prof. Gianluca Campana).
Degree course: Bsc in Cognitive and Psychobiological Psychological Sciences

a.a. 2020/2021 **Research support activity** – Department of General Psychology
Programming and implementation of web-based experiments, data collection, and analysis.
Developed experimental procedures (jsPsych, JavaScript) and analysis scripts (R) for both research and instructional purposes

a.a. 2020/2021 **Research support activity** – Department of General Psychology
Development of a tutorial for students on how to design web-based experiments.
Recorded 10-hour video course on jsPsych JavaScript library, available on Moodle

TUTORING EXPERIENCES

During my PhD studies, I have tutored seven students on their Bachelor's thesis writing, on the following topics: visual aversive learning in sensory discrimination; spatiotemporal form-motion integration in Glass pattern perception; research methodology in the study of flicker-induced hallucinations, research methodology in the study of visual awareness and its neural correlates.

SCIENTIFIC TRAINING

Across my studies at the University of Padova, I have attended the following 20-hour seminars organized by the Department of General Psychology as part of the seminar series Advanced Courses for Scientific Research - CARS (Corsi Avanzati per la Ricerca Scientifica):

2022 *EEG Signal Analysis (EEGLAB Software)*
2020 *Eye-Tracking Methodology*
2018 *Statistical Analysis of Event-Related Potentials (ERP) in R*

LABORATORY EXPERIENCES

Since my Bachelor's-level internship and, even more so, during my two international experiences—specifically, my Master's-level internship at Ludwig Maximilian University and the period spent as a visiting PhD student at Université Paris Cité—I have developed a strong autonomy in managing laboratory experiments. Throughout my training, several firsthand research experiences involving collection of multiple types of experimental data have allowed me to refine the skills needed to manage all stages of an experimental project, from planning and running experimental sessions to monitoring project progress and analyzing results. I believe this background has also equipped me to effectively supervise intern students, guiding them in adapting to the lab's workflow and introducing them to practices that support efficient lab management, such as regular equipment maintenance, timely participant recruitment, and flexible session scheduling. My laboratory experiences have also offered frequent opportunities to exercise problem-solving skills, especially for the containment and resolution of both technical and methodological challenges, allowing me to develop a proactive approach to foreseeable issues that may arise during experimentation. Alongside this independence in lab management, I practice teamwork through frequent communication with all lab members and external researchers with whom I collaborate, both in person and remotely.

I have cultivated my academic English skills throughout my education, including drafting both my Bachelor's and Master's theses in English. As a PhD student, I have had further opportunities to train intensively in writing scientific articles and creating both oral and poster presentations. My international experiences, which include attendance at several international conferences, have helped me achieve proficiency in both written and spoken academic English.

PROGRAMMING SKILLS

- **HTML** – proficient
  HTML5
  HTML5 Canvas
- **CSS** – proficient
- **JavaScript** – proficient (with a focus on the programming of visual stimuli and experimental procedures, exploratory data analysis, and data visualization)
  jsPsych, Three.js, Chart.js
- **Python** – proficient (with a focus on the programming of visual stimuli and experimental procedures, behavioral and EEG data analysis, and computational modelling)
  PsychoPy, MNE
- **R** – advanced (with a focus on experimental data analysis and computational modelling)
  dplyr, ggplot2, flexplot, lme4, glmm, MixedPsy, psyphy, psycho
- **MATLAB/Octave** – intermediate (with a focus on the programming of visual tasks and experimental data analysis)
  Psychtoolbox-3, EEGLAB

TECHNICAL SKILLS

- **tES** – proficient
  BrainSTIM
- **TMS –** advanced
  MagPro X100, MagStim
- **Eye tracking** – advanced
  Eyelink 1000
- **EEG** – intermediate
  ActiCAP, ActiChamp

LANGUAGE SKILLS

- **Italian**
  Native speaker
- **English**
  C1 Level
- **French**
  B1 Level
- **German**
  A2 Level