

Melissa Monti

Biomedical Engineer, PhD student in Biomedical Engineering

Education

- Nov 2022 – ongoing **PhD student in Biomedical, Electrical and System Engineering – curriculum: Biomedical Engineering**
University of Bologna, Italy
Responsibilities: EEG and behavioral tasks programming and data acquisition, preprocessing and processing of invasive and non-invasive EEG data, biophysical neuro-computational modeling, graph theoretical analysis of EEG and MRI-based data.
- 2023 **Professional Engineer License**
- 2022 **Master Degree in Biomedical Engineering for Neuroscience**
University of Bologna, Italy
- Final grade: 110/110 cum Laude
 - Score weighted average: 30/30
 - Master Thesis: Investigating perceptual multisensory impairments in autism through a neural network: a possible neural implementation for the shift from cross-modal competition to facilitation.
- Feb 2022 – May 2022 **Research Internship**
University of Bologna, Italy
Project: Neurocomputational modeling of multisensory integration.
- 2020 **Bachelor Degree in Biomedical Engineering**
University of Bologna, Italy
- Final grade: 110/110 cum Laude
 - Score weighted average: 29.68/30

Additional courses

- 12 Jul – 11 Sept 2024 **Advanced machine learning and deep learning techniques for Medicine**
Organizer: University of Bologna
Cesena, Italy
- 12, 13 Jun 2024 **Artificial intelligence for multi-variate brain signals**
Organizer: University of Bologna
Cesena, Italy
- 4, 5 Jun 2024 **Scientific programming in Python: an introduction for bioengineers**
Organizer: University of Bologna
Cesena, Italy
- 7 Mar – 22 Mar 2024 **Special Topics in Applied Neuro-Engineering**
Organizer: University of Bologna
Cesena, Italy

- 11 Jun – 16 Jun 2023 **Summer School on Neurorehabilitation (SNNR) 2023**
*Organizer: Shirley Ryan AbilityLab, Imperial College of London, Hospital los Madroños
Baiona, Spain*
- 8 Jun – 9 Jun 2023 **Brain Inspired Computing Workshop (BICW)**
*Organizer: Università degli studi di Modena e Reggio Emilia
Modena, Italy*
- 18 Jan – 24 Feb 2023 **Methods and applications - Introduction to AI for Health and well-being**
*Organizer: University of Bologna
Online*
- Oct – Dec 2020 **Behavioural and cognitive neuroscience**
*Organizer: IMT School for Advanced Studies Lucca
Pisa, Italy*

Research Experience

- Oct. 2023 – ongoing **Visiting PhD Student**
Sapienza University of Rome, Italy
Responsibilities: task programming, EEG data acquisition and processing, brain mapping, ERPs, spectral analysis, graph theoretical analyses of EEG and MRI data.
- Aug 2022 – Sept 2022 **Master Thesis Student**
Albert Einstein College of Medicine, The Cognitive Neurophysiology Laboratory (CNL), New York, USA

Participation in research projects

- Investigator for the project “ACT2: Acting together: how motor styles shape action prediction and brain-to-brain connectivity in typical and autistic populations”, PRIN 2020, prot. 20207S3NB8, Italian Ministry of University and Research, 2022-2025.
- Investigator for the project “KEATS - Playing in the same Key: Emotions sharing in Autism by multi-Subject models”, Bando SEED - PNR Università Sapienza, 2021-2024.
- Investigator for the project “VR-BCI4PM: A virtual reality system controlled by a hybrid brain-computer interface to improve powered mobility in individuals with neuromotor disorders”, PRIN 2022, Italian Ministry of University and Research.
- Investigator for the project “Visuospatial modulation of bimanual touch perception in real and virtual environments”. National Science Foundation (NSF) NSF 2019959.

Collaborations

Sapienza University of Rome

Prof. Laura Astolfi

Country: Italy

Albert Einstein College of Medicine

Prof. Sophie Molholm

Country: USA

Wake Forest University

Prof. Barry E. Stein and Prof. Benjamin Rowland

Country: USA

Wake Forest University, Comprehensive Cancer Center

Prof. Roy E. Strowd

Country: USA

Baylor College of Medicine

Prof. Jeffrey M. Yau

Country: USA

UCLA

Prof. Ladan Shams

Country: USA

Publications

Papers in International Journals

- **Monti, M.**, Molholm, S., Cuppini, C. The evolution of cross-modal brain organization during development: a neurocomputational-based investigation on typically developing and autistic children. *Submitted*.
- Cuppini, C., Di Rosa, E.F., **Monti, M.** A Neurocomputational Model of Multisensory Perception in the Spatio-Temporal Domain. *Submitted*.
- Cuppini, C., Molholm, S., **Monti, M.** Is competition the default configuration of cross-modal interactions? *Submitted*.
- **Monti, M.**, Molholm, S., Cuppini, C. (2023). Atypical development of causal inference in autism inferred through a neurocomputational model. *Frontiers in Computational Neuroscience*. 17.
- Cuppini, C., Magosso, E., **Monti, M.**, Ursino, M., & Yau, J. M. (2022). A neurocomputational analysis of visual bias on bimanual tactile spatial perception during a crossmodal exposure. *Frontiers in neural circuits*, 16, 933455.

Indexed Long Abstracts in National Conferences

- **Monti, M.**, Bisi, M.C., Stagni, R., Cuppini, C. (2023). The neural bases of sensory reweighting for postural control: a neuro-computational model. In *Proceedings XXIII Congresso SIAMOC 2023*. Page 98. Roma.

Abstract in National and International Conferences

- **Monti, M.** and Cuppini, C. Atypical development of causal inference in autism. FENS Forum 2024, Vienna (Austria), 25 Jun – 29 Jun (Abstract number 2062).
- **Monti, M.**, Bisi, M. C., Stagni, R., Cuppini, C. The neural bases of sensory reweighting for postural control: a neuro-computational model. XXIII Neuroscience 2023, Washington (USA), 11 Nov - 15 Nov (Session PSTR281, Presentation number PSTR281, Abstract Control Number 7166).

- Cuppini, C., **Monti, M.**, Magosso, E., Yau, J. Visual bias on bimanual tactile perception: investigation of the neural mechanisms using neurocomputational modelling. International Multisensory Research Forum 2023, Brussels (Belgium), 27 Jun - 30 Jun (Poster 81).
- **Monti, M.**, Molholm, S., Cuppini, C. A neural model of sensory interactions in young neurotypical and ASD children. VIII National Congress on Bioengineering 2023, Padua (Italy), 21 Jun - 23 Jun. (Abstract ID: 1643).
- **Monti, M.**, Molholm, S., Cuppini, C. A model of the maturation of sensory interactions: from cross-modal competition to facilitation in Autism. 2023 11th International IEEE/EMBS Conference on Neural Engineering, Baltimore (USA), 25 Apr-27 Apr (Abstract 406, Paper ID: 1570881557).
- Stein, B. E., Rowland, B. A., **Monti, M.**, Magosso, E., Cuppini, C. Neural Mechanisms Underlying the Reversal of Hemianopia with Multisensory Training. International Multisensory Research Forum 2022, Ulm (Germany), 3 Jul - 7 Jul (Poster 4:30, Abstract 291).
- Cuppini, C., **Monti, M.**, Ursino, M., Shams, L. A Hebbian model of the lexical-semantic memory helps explain the multisensory benefit in learning name-face association. CNS Annual Meeting 2022, San Francisco (USA), 23 Apr - 26 Apr (Poster Session A, Abstract 53).

Talks

Invited speech: Investigating perceptual multisensory impairments in Autism through a neural network: a possible neural implementation for the shift from cross-modal competition to facilitation, Albert Einstein College of Medicine, 14 Sept 2022.

Academic and didactic experience

- Teaching assistant:
 - A.A. Fundamentals of Biomedical Instrumentation
2024/2025 *Bachelor's Degree in Biomedical Engineering, University of Bologna*
 - A.A. Physiology
2022/2023, *Bachelor's Degree in Biomedical Engineering, University of Bologna*
2023/2024
- Co-supervisor to 2 Master Theses in Biomedical Engineering
- Co-supervisor to 7 Bachelor Theses in Biomedical Engineering

Honours and Awards

- 10 May 2024 **Merit-based scholarship for academic courses A.Y. 2021/2022**
INPS
- 13 Sept 2023 **Best Master Thesis "Nearlab 2023 - Politecnico di Milano"**
Italian National Group of Bioengineering (GNB)
- 7 Jun 2020 **Merit-based scholarship for laudable students enrolled in the A.Y. 2019/2020**
University of Bologna
- 22 May 2020 **Merit-based scholarship for academic courses A.Y. 2017/2018**
INPS

- 29 Jun 2019 **Merit-based scholarship “Antonio Fiorini” for university students**
Municipality of Molinella
- 18 Jun 2019 **Merit-based scholarship for laudable students enrolled in the A.Y. 2018/19**
University of Bologna
- 9 Jan 2019 **Merit-based scholarship for enrollment in courses relating to disciplinary areas
of particular national interest**
University of Bologna

Personal skills

Job-related skills:

- Management, planning and setup preparation of experiments involving behavioral and electrophysiological data acquisition
- Task implementation;
- EEG and EEG-hyperscanning data acquisition;
- Invasive and non-invasive EEG pre-processing and analysis;
- EEG connectivity and multi-brain connectivity;
- Application of graph theory analysis to EEG and MRI data;
- Neurocomputational modelling.

Technical skills:

- Proficient user of Matlab;
- Confident with Python;
- Proficient user of Psychtoolbox;
- Advanced user of Brain Products® EEG amplifiers and caps;
- Advanced user of EEGLAB and Brain Vision Analyzer;
- Advanced user of Vicon motion capture system and Vicon Nexus® software;
- Confident with Tobii Pro Glasses 3 eye tracking system;
- Confident with inertial sensors.

Languages

Italian: mother tongue

English: advanced user (C1)

Certificates: CAE Cambridge Certificate in Advanced English (June, 2020)

I declare that the information in this Curriculum Vitae is accurate and true. I authorize the processing of my personal data in the cv in accordance with Article 13 of Legislative Decree No. 196 of June 30, 2003 "Code on the Protection of Personal Data" and Article 13 of the GDPR (EU Regulation 2016/679).

Roma, 06/09/2024
Melissa Monti