

Giacomo Barzon

30-09-1996 | Padova, Italy

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- M.Sc. in [Physics of Data](#) at the University of Padova, integrating advanced Physics expertise with comprehensive Data Science training.
- Currently pursuing my PhD in Neuroscience at the [Padova Neuroscience Center](#) under the supervision of Prof. Samir Suweis from the [LIPh](#) and Prof. Manlio De Domenico from the [CoMuNe Lab](#).
- I am primarily interested in how the complex structure of the brain, both at the meso and macro scales, drives the emergence of complex dynamical and behavioral patterns, how these patterns are altered during diseases, and how we can design interventions to restore normal functionality.
- Throughout my academic and professional experiences, I have acquired a strong understanding of computational simulations, data analysis, and machine learning techniques. I possess an advanced level of knowledge in several programming languages.

Research experience

Research fellowship

PADOVA NEUROSCIENCE CENTER, UNIVERSITY OF PADOVA

Project: *Multimodal analysis and modeling of brain activity*

[Padova, IT](#)

Oct. 2024 - Today

Visiting Ph.D. student

UNIVERSITY OF OREGON

Computational Neuroscience Lab, with Prof. Luca Mazzucato

[Eugene, US](#)

Apr. 2024 - Aug. 2024

Visiting Ph.D. student

UNIVERSITY OF BERKELEY

Redwood Center for Theoretical Neuroscience

[Berkeley, US](#)

May 2024

Education

Ph.D. in Neuroscience

PADOVA NEUROSCIENCE CENTER, UNIVERSITY OF PADOVA

Project: *Probing Brain Networks: Perturbation Models and their Role in Understanding Brain Structure and Function*

[Padova, IT](#)

Oct. 2021 - Sep. 2024

M.S. in Physics of Data

UNIVERSITY OF PADOVA, FINAL GRADE: 110/110 WITH HONORS - GPA: 30/30

Thesis: *Structure-function relation in a stochastic whole-brain model at criticality*

[Padova, IT](#)

Oct. 2018 - Apr. 2021

Erasmus+ scholarship

UNIVERSITY OF HEIDELBERG, ECTS GPA: A/A

[Heidelberg, GE](#)

Oct. 2018 - Apr. 2021

B.S. in Physics

UNIVERSITY OF PADOVA, FINAL GRADE: 108/110 - GPA: 28.2/30

Thesis: *Advanced automatic analysis of Cloud Chamber images*

[Padova, IT](#)

Sep. 2015 - Sep. 2018

Work Experience

App developer

A4 SMART S.R.L.S. - FULL TIME, APPRENTICESHIP

Within the VATE (Virtual Assistant Turist Executive) project, funded by the Region with EU funds Por-Fesr, consists in the design of a smartphone app that acts as a historical-artistic and commercial guide in the historic center of Venice, integrating a CRM system and the navigation functionality also for visually impaired thanks to iBeacon technology.

[Venice, IT](#)

Dec. 2017 - June 2018

Software Engineer Intern

HANDING S.A.S. - PART TIME

Research and experimentation on signal propagation generated from beacons and their feasibility for geolocalization, both in internal and external environments, integration with mobile devices (iOS, Android).

Padova, IT

Aug. 2016 - Dec. 2017

Publications

EEG microstate transition cost correlates with task demands

G. BARZON, E. AMBROSINI, A. VALLESI, S. SUWEIS

[PLOS COMP. BIO.](#)

20 (10), e1012521 (2024)

Unraveling the mesoscale organization induced by network-driven processes

G. BARZON, O. ARTIME, S. SUWEIS, M. DE DOMENICO

[PNAS](#)

121 e2317608121 (2024)

Maximal information at the edge of stability in excitatory-inhibitory neural populations

G. BARZON, D. M. BUSIELLO, G. NICOLETTI

[ARXIV](#)

2406.03380 (2024)

Prenatal experience with language shapes the brain

B. MARIANI, G. NICOLETTI, G. BARZON, M. C. O. BARAJAS, M. SHUKLA, R. GUEVARA, S. SUWEIS, J. GERVAIN

[SCIENCE ADVANCES](#)

9 (47), eadj3524 (2023)

Criticality and network structure drive emergent oscillations in a stochastic whole-brain model

G. BARZON, G. NICOLETTI, B. MARIANI, M. FORMENTIN, S. SUWEIS

[J. PHYS. COMPLEX.](#)

3, 025010 (2022)

Modelling the deceleration of COVID-19 spreading

G. BARZON, K. KABBUR HANUMANTHAPPA MANJUNATHA, W. RUGEL, E. ORLANDINI, M. BAIESI

[J. PHYS. A MATH. THEOR.](#)

54(4), 044002 (2021)

Invited talks

Structural Foundations of Brain Criticality: Unraveling the Influence of the Human Connectome

MULTISCALE & INTEGRATIVE COMPLEX NETWORKS: EXPERIMENTS & THEORIES 2023 - SATELLITE AT NETSCI

Vienna, AU

Jul. 2023

Quantifying reconfiguration cost from neurophysiological data

SPRING WORKSHOP ON PHYSICS OF DATA 2023

Venice, IT

Apr. 2023

Contributed talks & posters

Network days: Bridging micro with macro

TALK: UNRAVELING THE MESOSCALE ORGANIZATION INDUCED BY NETWORK-DRIVEN PROCESSES

Padova, IT

Oct. 2024

First conference of the Italian Network for Computational Neuroscience

POSTER: OPTIMAL CODING IN EXCITATORY-INHIBITORY NEURAL POPULATIONS

Rome, IT

Sep. 2024

NetSciX 2024: International School and Conference on Network Science

TALK: UNRAVELING THE MESOSCALE ORGANIZATION INDUCED BY NETWORK-DRIVEN PROCESSES

Venice, IT

Jan. 2024

NetSci 2023: International School and Conference on Network Science

TALK: UNRAVELING THE MESOSCALE ORGANIZATION INDUCED BY NETWORK-DRIVEN PROCESSES

Vienna, AU

Jul. 2023

Bernstein Conference

POSTER: CRITICALITY AND NETWORK STRUCTURE DRIVE EMERGENT OSCILLATIONS IN A STOCHASTIC WHOLE-BRAIN MODEL

Berlin, GE

Sep. 2022

Padova-Monash Connect: Brain connectivity workshop

TALK: BRAIN CRITICALITY AND STRUCTURAL FEATURES OF THE HUMAN CONNECTOME

Online

Jul. 2022

LIPh Spring Workshop 2022

TALK: APPROACHES TO BRAIN CONTROLLABILITY

Asiago, IT

Apr. 2022

Attended schools & workshops

Neuroscience and Artificial Intelligence

WORKSHOP @ UNIVERSITY OF WASHINGTON

Seattle, US

Aug 2024

Mediterranean School of Complex Networks

SCHOOL

Catania, IT

June 2023

EITN Fall School in Computational Neuroscience

SCHOOL

Paris, FR

Sep. 2022

Workshop: Spatial Brain Dynamics

WORKSHOP @ UNIVERSITY OF COPENHAGEN

Online

May 2021

Spring College on the Physics of Complex Systems

WORKSHOP @ ICTP AND SISSA

Online

Mar. 2021

International Winter School 'MRInference: From data to knowledge'

SCHOOL @ UNIVERSITY OF PADOVA

Padova, IT

Feb. 2021

Teaching experience

Programming

BACHELOR DEGREE IN MATHEMATICS, UNIVERSITY OF PADOVA

Padova, IT

Fall Semester 2022/23

Supervision

Cosupervision of four Bachelor's thesis in Physics.

Referee

PLOS COMPUTATIONAL BIOLOGY, IEEE TRANSACTIONS ON NEURAL NETWORKS AND LEARNING SYSTEMS, PHYSICAL REVIEW E, PLOS ONE, CHAOS: AN INTERDISCIPLINARY JOURNAL OF NONLINEAR SCIENCE, FRONTIERS IN HUMAN NEUROSCIENCE.

Projects

A collection of my academic and work projects can be found at <https://github.com/gbarzon>.

Skills

Languages Italian (native language) English (proficient)

Programming Python (advanced) Swift (advanced) Matlab (advanced) R (advanced) Java (basic) C++ (basic)