

DANILO BENOZZO

PERSONAL INFORMATION

place of birth Castelfranco Veneto, Treviso, Italy
nationality Italian

CONTACT INFORMATION

email danilo.benozzo@unipv.it

EDUCATION

2012-2017 University of Trento, Italy
Ph.D. · **Information and Communication Technology** ·
Thesis: *Detecting Brain Effective Connectivity with Supervised and Bayesian Methods*
Advisors: Dr. Paolo Avesani & Ph.D. Emanuele Olivetti
2009-2012 University of Padova, Italy
M.Eng · **Bioengineering** ·
Thesis: *Deconvolution Algorithm Optimization in DSC-MRI*
Advisors: Prof. Alessandra Bertoldo & Ph.D. Denis Peruzzo
2006-2009 University of Padova, Italy
B.S. · **Biomedical Engineering** ·
Thesis: *Automatic Lesion Segmentation in Retinal Images*
Advisors: Prof. Enrico Grisan

RESEARCH ACTIVITIES

2023-*now* Department of Brain and Behavioral Sciences, University
of Pavia, Pavia, Italy
Researcher-type A *Neurocomputation Lab* Modelling the cerebellar microcircuit
2020-2023 Department of Information Engineering, University of
Padova, Padova, Italy
*Postdoctoral
Researcher* *Functional and Anatomical Imaging Research Lab, (FAIR)* Large scale brain modelling
2018-2020 Department of Physiology and Pharmacology, Sapienza
University of Rome, Rome, Italy
*Postdoctoral
Researcher* *Behavioral Neurophysiology Lab* Analysis and modelling of brain
electro-physiological data
2013-2017 NeuroInformatics Laboratory (NILab), Bruno Kessler
Foundation (FBK), Trento, Italy
Ph.D. Student The main goal of my PhD was to apply/develop/characterize statistical analysis
techniques in order to be applied on neuroscientific data. In particular, I focused
on brain decoding and effective connectivity estimate.
2011-2012 Department of Information Engineering, University of
Padova, Italy
Master Student *Functional and Anatomical Imaging Research Lab, FAIR*

EXPERIENCE

11/2014-
02/2015 Radboud University, the Netherlands
*Visiting Ph.D.
Student* *Computational Cognitive Neuroscience Lab* at the *Donders Institute for Brain, Cognition
and Behaviour*

CONFERENCE AND WORKSHOP

07/2023 Annual Computational Neuroscience Meeting - CNS2023
International annual conference of the Organization for Computational

Neurosciences (OCNS)

07/2022 Org. for Human Brain Mapping Conference - OHBM2022

International annual conference of the Organization for Human Brain Mapping (OHBM)

08/2019 Annual Computational Neuroscience Meeting - CNS2019

International annual conference of the Organization for Computational Neurosciences (OCNS)

09/2017 Coupling and Causality in Complex Systems - C3S

International Conference hosted by the Quantitative Modeling of Complex Systems Area of the University of Cologne (UoC), Germany

06/2016 PRNI2016

6th International Workshop on Pattern Recognition in Neuroimaging, Trento, Italy

07/2015 Advances in Causal Inference - UAI2015

31st Conference on Uncertainty in Artificial Intelligence, Amsterdam, the Netherlands

06/2014 PRNI2014

4th International Workshop on Pattern Recognition in Neuroimaging, Tübingen, Germany

10/2012 FieldTrip Workshop

FieldTrip is a MATLAB software toolbox for MEG and EEG analysis.

07/2010 2nd National Congress of Bioengineering

Torino, Italy

SCHOOL AND COURSE

12/2022 *Modeling the Brain*

7-th Course of Intern. School of Brain Cells and Circuits "Camillo Golgi" - Erice, IT

12/2021 *Modeling the Brain*

6-th Course of Intern. School of Brain Cells and Circuits "Camillo Golgi" - Erice, IT

09/2020 *Pattern Recognition in Neuroimaging - PRNI 2020*

Virtual Summer School

08/2020 *Organization for Human Brain Mapping - OHBM 2020 Educational Courses*

Virtual Summer School

09/2019 *Computational and Theoretical Models in Neuroscience*

University of Padova, IT

01/2014 *Gaussian Processes*

University of Sheffield, UK

08/2013 *Advanced Topics in Machine Learning*

DTU, Denmark

09/2012 *Structure the Brain*

MEG Center, University of Tübingen, Germany

PUBLICATIONS

2024 **Analyzing asymmetry in brain hierarchies with a linear state-space model of resting-state fMRI data**

Journal paper

D. Benozzo, G. Baggio, G. Baron, A. Chiuso, S. Zampieri, A. Bertoldo
Network Neuroscience,

<https://doi.org/10.1162/netn.a-00381>

- 2024 **Neurons in the monkey frontopolar cortex encode learning stage and goal during a fast learning task**
Journal paper S Nougaret, L Ferrucci, F Ceccarelli, S Sacchetti, D Benozzo, V Fascianelli, R C Saunders, L Renaud, A Genovesio
 PLoS biology,
<https://doi.org/10.1371/journal.pbio.3002500>
- 2024 **Macroscale coupling between structural and effective connectivity in the mouse brain**
Journal paper D Benozzo, G Baron, L Coletta, A Chiuso, A Gozzi, A Bertoldo
 Scientific Reports,
<https://doi.org/10.1038/s41598-024-51613-7>
- 2024 **Controlling target brain regions by optimal selection of input nodes**
Journal paper K K Hanumanthappa Manjunatha, G Baron, D Benozzo, E Silvestri, M Corbetta, A Chiuso, A Bertoldo, S Suweis, M Allegra
 PLOS Computational Biology,
<https://doi.org/10.1371/journal.pcbi.1011274>
- 2023 **Effects of contraction bias on the decision process in the macaque prefrontal cortex**
Journal paper Benozzo D., Ferrucci L. and Genovesio A.
 Cerebral Cortex,
<https://doi.org/10.1093/cercor/bhac253>
- 2022 **Social monitoring of actions in the macaque frontopolar cortex**
Journal paper Ferrucci L., Nougaret S., Ceccarelli F., Sacchetti S., Fascianelli V., Benozzo D. and Genovesio A.
 Progress in Neurobiology,
<https://doi.org/10.1016/j.pneurobio.2022.102339>
- 2021 **Slower prefrontal metastable dynamics during deliberation predicts error trials in a distance discrimination task**
Journal paper Benozzo D., La Camera G. and Genovesio A.
 Cell Reports,
<https://doi.org/10.1016/j.celrep.2021.108934>
- 2021 **Macaque monkeys learn and perform a non-match-to-goal task using an automated home cage training procedure**
Journal paper Sacchetti S., Ceccarelli F., Ferrucci L., Benozzo D., Brunamonti E., Nougaret S. and Genovesio A.
 Scientific Reports,
<https://doi.org/10.1038/s41598-021-82021-w>
- 2018 **Classification-based Prediction of Effective Connectivity between Time Series with a Realistic Cortical Network Model**
Journal paper Olivetti E., Benozzo D., Bin J., Panzeri S. and Avesani P.
 Frontiers in Computational Neuroscience,
<https://doi.org/10.3389/fncom.2018.00038>
- 2017 **Bayesian estimation of directed functional coupling from brain recordings**
Journal paper Benozzo D, Jylänki P, Olivetti E, Avesani P, van Gerven MAJ,
 PLoS ONE 12(5)
<https://doi.org/10.1371/journal.pone.0177359>
- 2017 **Supervised Estimation of Granger-based Causality between Time Series**
Journal paper Benozzo D., Olivetti E., Avesani P.,
 Methods, Frontiers in Neuroinformatics,
<https://doi.org/10.3389/fninf.2017.00068>
- 2023 **Modelling the autistic cerebellum: alterations in granule cells and propagation of effects through the microcircuit**

*Abstract
proceeding*

C Casellato, L Torsello, A Marta, R De Schepper, D Benozzo, S Masoli, E D'Angelo
32nd Annual Computational Neuroscience Meeting CNS*2023

2022 **BOLD-based hemodynamic features inferred from
dynamic causal modeling relate to subject's age range**

*Abstract
proceeding*

Baron G., Benozzo D., Gindullina E., Silvestri E., Chiuso A., Bertoldo A.,
BRAIN and BRAIN PET 2022, 29 May-1 June 2022, Glasgow, UK.
JOURNAL OF CEREBRAL BLOOD FLOW AND METABOLISM,
vol. 42, ISSN: 0271-678X, Glasgow, UK, 29 May-1 June 2022

2022 **Incoming and Outgoing Information Flows Relate with
Node Functional Strength both in Human and Mouse Resting State
fMRI**

*Abstract
proceeding*

Baron G., Benozzo D., Gindullina E., Coletta L., Zorzi M., Gozzi A., Corbetta M.,
Chiuso A., Bertoldo A.,
Fourth Brainstorming Research Assembly for Young Neuroscientists (BraYn), Italy,
20-22 October 2021. NEUROLOGY INTERNATIONAL, vol. 14, p. 109-157, ISSN:
2035-8377, Pisa, Italy, 20-22 October 2021
<https://doi.org/10.3390/neurolint14010010>

2019 **A hidden state analysis of prefrontal cortex activity
underlying trial difficulty and erroneous responses in a distance
discrimination task**

*Abstract
proceeding*

D Benozzo, G La Camera, A Genovesio
28th Annual Computational Neuroscience Meeting CNS*2019
<https://doi.org/10.1186/s12868-019-0538-0>

2023 **Dynamic Brain Networks with Prescribed Functional
Connectivity**

Conference paper

U Casti, G Baggio, D Benozzo, S Zampieri, A Bertoldo, A Chiuso
2023 62nd IEEE Conference on Decision and Control (CDC)

2023 **Single region contribution to the brain dynamic (in)
stability**

Conference paper

D Benozzo, G Baron, G Baggio, A Gozzi, M Corbetta, A Chiuso, S Zampieri, A
Bertoldo
Convegno Nazionale di Bioingegneria (Patron Editore srl)

2016 **Classification-Based Causality Detection in Time Series**

Conference paper

Benozzo D., Olivetti E., Avesani P.,
In: Rish I., Langs G., Wehbe L., Cecchi G., Chang K., Murphy B. (eds) Machine
Learning and Interpretation in Neuroimaging. MLINI 2014, MLINI 2013. Lecture
Notes in Computer Science, vol 9444. Springer, Cham

2013 **The Kernel Two-Sample Test vs. Brain Decoding**

Conference paper

E. Olivetti, D. Benozzo, S. M. Kia, M. Ellero and T. Hartmann,
2013 International Workshop on Pattern Recognition in Neuroimaging,
Philadelphia, PA, 2013, pp. 128-131. [doi:10.1109/PRNI.2013.41](https://doi.org/10.1109/PRNI.2013.41)

OTHER INFORMATION

*Teaching/academic
activities*

Teaching · "Brain modelling for biomedicine and ICT" (3CFU) master's degree
course in Human-Centered Artificial Intelligence, University of Milan, AY
2023/2024

Teaching · "Neural modelling and computation" (2CFU) master's degree course in
Psychology, Neuroscience and Human Sciences, IUSS/University of Pavia, AY
2023/2024

Teaching assistant · "Imaging for Neuroscience" master's degree course in
Bioengineering, University of Padova, AY 2020/2021, 2021/2022

Teaching assistant · "Metodi statistici per la bioingegneria" bachelor's degree
course in Biomedical Engineering, University of Padova, AY 2022/2023

Thesis co-supervision · "Investigate the brain as a complex system: the use of
transfer entropy to measure directed brain interactions on resting-state BOLD
signals" master's thesis in Bioengineering

<i>Awards</i>	2018 · Excellence Certificate by the International PhD Program of FBK 2014 · second place at the Biomag2014 Causality Challenge (Causal2014) 2012 · Thesis Award GNB (National Group of Bioengineering)
<i>Areas of expertise</i>	Signal processing · Causal inference between time series · Brain connectivity inference · Patter recognition · Machine Learning
<i>Programming and Software knowledge</i>	PYTHON · Proficient level (NumPy, SciPy, scikit-learn, mne-Python) MATLAB · Proficient level JAVA · Basic level VERSION CONTROL · Git and GitHub (Elementary level)
<i>Languages</i>	ITALIAN · Mother tongue ENGLISH · Intermediate

May 24, 2024

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Danilo Benozzo