

Antonio Roberto Buonfiglio

PhD Student

Curriculum Vitae et Studiorum

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Date of birth: 18/03/1994

Education

- 1 Nov 2021 - Present **PhD student in Biomedical and Neuromotor Science, Alma Mater Studiorum, University of Bologna, Italy.**
Advisor: Prof.ssa Patrizia Fattori, Full Professor, Alma Mater Studiorum, University of Bologna
Co-Advisor: Ivilin Stoianov, Researcher, CNR-Institute of Science and Technology of Cognition (ISTC)
- 1 Nov 2021 - Present **MAIA Project: Multifunctional, adaptive and interactive AI system for Acting in multiple contexts, CNR-ISTC.**
Coordinator: Alma Mater Studiorum, University of Bologna, Italy
- 10 Gen 2018 - 29 September 2021 **Master's Degree in Physics of Biosystems, La Sapienza University of Rome, Italy.**
Thesis title: *Investigation on limits of Deep Taylor Decomposition in electrophysiological data classification*
Advisor: Professor Maurizio Mattia, Full Professor, Sapienza University of Rome
Co-Advisor: Guido Gigante, Researcher, Italian Institute of Health
Final grade: 110/110
- 30 Sep 2012 - 10 Gen 2018 **Bachelor's Degree in Physics, La Sapienza University of Rome, Italy.**
Thesis title: *Fisica della SPECT*
Advisor: Professor Riccardo Faccini, Full Professor, Sapienza University of Rome
Final grade: 88/110

Research experience

- 2021 - Present **CNR-Institute of Science and Technology of Cognition.**
PhD in Computational Neuroscience, Biomedical and Neuromotor Science Department, Alma Mater Studiorum, University of Bologna, led by Prof.ssa Patrizia Fattori and Ivilin Stoianov
- **Active inference** in decoding intentions of human and non-human primates from neural, ocular and kinematic signals.
 - **Deep learning** in decoding intentions of human and non-human primates from neural signals.
- 2020-2021 **Italian Institute of Health.**
Master Thesis project in Deep learning and explainability on electrophysiological data, led by Prof. Maurizio Mattia
- Deep learning classification methods applied to records of monkey's Multi Unit Activity. Usage of Deep Taylor Decomposition (DTD) to explain Deep Neural Network's decisions.
 - Theoretical studies on Machine learning model-free methods and computation of complex neural networks such as Logistic regression, Multilayer Perceptron, Convolutional Neural Network, Recurrent Neural Network, Long Short Term Memory; application of Machine Learning to electrophysiological data. Analysis on limits of DTD in explaining classification based on temporal features
 - Confidence in dealing with Python's modules for Machine Learning: Tensorflow, Keras, Pytorch, iNNvestigate/Albermax.
- 2018-2019 **Soft and Living Matter Lab.**
Internship under the supervision of Professor Roberto Di Leonardo (Full Professor, Sapienza University of Rome)
- Analysis on growth and motility of E. Coli in presence and absence of oxygen.
 - Use of Nikon ECLIPSE TE2000-U microscope, and Hamamatsu Orca-Flash 4.0 V2 Digital CMOS C11440-22CU camera to observe and record E. coli's motion.
 - Studies on theory and Python computation of Differential Dynamic Microscopy.

Further education

- June 2022 - **Data Visualization with Python.**
July 2022 Course with certificate provided by: IBM-Coursera
- January 2022 **Computational Neuroscience.**
- June 2022 Course with certificate provided by: Rajesh P. N. Rao, University of Washington
- March 2022 - **Academic English Course.**
June 2022 Course with certificate provided by: CLA (Centro Linguistico di Ateneo), University of Bologna
- April 2020 - **Introduction to Machine Learning.**
June 2020 Course with certificate provided by: Duke University
- Jan 2020 - **MIMO Python Course.**
Apr 2020 Lessons on core concepts needed to program in Python, including data structures, control statements, functions and modules. Certificate provided by Johannes Berger (CEO, MIMO)
- Sept 2010 - **English Cambridge First Certificate.**
June 2011 Course with certificate provided by: British Council
- Lug 2010 **Cobham Hall English Summer School.**
English Course in Cobham(Kent, England)
- Jul-Aug 2011, **Donegal English Language School.**
2012, 2013, English Course in Bundoran (Donegal, Ireland)
2014
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Working Experience

- 2021 - **PhD student, CNR-ISTC based in Padua, Italy.**
Present **Reference university:** Alma Mater Studiorum, University of Bologna
- 2015-2021 **Tutoring and Private Lessons.**
Tutoring several students, about 2 hours per day, in: Calculus I and II, Linear Algebra, General Physics (for University); Mathematics, Physics, Biology, Chemistry and preparation for scientific final exam (for High School); Logic, Mathematics, Biology for preparation for Medicine admission test.
- 2020 **Programming Managment System.**
Tyler s.r.l., Via Riano, Roma (RM, Italy)
- 2016-2019 **Dental equipment sterilization assistant.**
Studio Odontoiatrico Cervellati, Viale Mazzini, Roma (RM, Italy).
- 2011-2021 **Delivery Man.**
 - o Pizzeria Bella Roma, Via Riboty, Roma (RM, Italy)
 - o Tyler s.r.l., Via Riano, Roma (RM, Italy)

Technical Skills

- Languages Italian (mother tongue), English (advanced)
- Programming Languages Python (advanced), C
- Software & Tools Linux, Windows, Keras, Tensorflow, iNNvestigate, Pytorch, Microsoft Office, L^AT_EX,