

Yuri Antonacci, Ph.D. candidate

github.com/YuriAntonacci

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Education and Training

- University of Palermo**, Palermo, Italy July 2020 – January 2022 (expected)
– Research Fellow (FIS/07), Department of Physics and Chemistry "Emilio Segrè"
- University of Rome "La Sapienza"**, Rome, Italy October 2016 – date
– Ph.D. Student in Bioengineering (ING-INF/06), Department of Computer, Control and Management Engineering "Antonio Ruberti"
- IRCCS Fondazione Santa Lucia**, Rome, Italy October 2016 – date
– Visiting Student at laboratory of Neuroelectrical Imaging and BCI
- University of Palermo**, Palermo, Italy September 2019 – December 2019
– Visiting Student at Department of Engineering
- IRCCS Fondazione Santa Lucia**, Rome, Italy January 2017 – September 2017
– Fellowship at laboratory of Neuroelectrical Imaging and BCI
- University of Rome "La Sapienza"**, Rome, Italy June 2016–October 2016
– Scholarship at Department of Computer, Control and Management Engineering "Antonio Ruberti"
- IRCCS Fondazione Santa Lucia**, Rome, Italy April 2015 – January 2016
– Internship at laboratory of Neuroelectrical Imaging and BCI
- University of Rome "La Sapienza"**, Rome, Italy A.Y. 2013/14–2015/16
– Master's degree in Biomedical engineering (INF-INF/06), 110/110 Cum Laude
– Advisor: Prof. Laura Astolfi
- University of Rome "La Sapienza"**, Rome, Italy A.Y. 2008/09–2012/13
– Bachelor's degree in Clinical engineering (INF-INF/06), 103/110
– Advisor: Prof. Domenico Caputo

Research Activity

Methodological context

- Development of methodologies for multivariate time series analysis in the time domain (prediction methods) and in the context of information theory for the description of the coupling between different dynamical systems.

Practical context

- Electroencephalographic signals analysis for the study of information flow between different brain regions. Characterization of multi-organ physiological systems in different physiological states.

Participation in research groups

- University of Rome "La Sapienza"**, Rome, Italy
– Bioengineering and Bioinformatic Laboratory (BiBiLab), Department of Computer and Management Engineering.
– Responsible: Prof. Laura Astolfi
- IRCCS Fondazione Santa Lucia**, Rome, Italy
– laboratory of Neuroelectrical Imaging and BCI

- Responsible: Donatella Mattia, M.D., Ph.D.

University of Palermo, Palermo, Italy

- Observatory of Complex Systems (OCS), Department of Physics and Chemistry "Emilio Segrè"
- Responsible: Prof. Rosario Nunzio Mantegna

University of Palermo, Palermo, Italy

- Laboratory of Optics and Optoelectronics (LOOX), Department of Engineering
- Responsible: Prof. Alessandro Busacca

Academic Activity

University of Rome "La Sapienza", Rome, Italy

- Integrative teaching activity for the basic course of mathematics, Faculty of business management (60 hours classroom teaching). A.Y. 2018/2019
- Seminar and tutorials for the "Neuroscience" course (Biomedical Engineering, ING-INF/06, 9CFU), A.Y. 2016/17, 2017/18, 2018/19, 2019/20
- Seminar and tutorials for the course: "Models of biological systems" (Biomedical Engineering, ING-INF/06, 9CFU), A.Y. 2016/17, 2017/18
- Seminar and tutorials for the course: "Methods for the analysis of biomedical signals" (Biomedical Engineering, ING-INF/06, 12CFU), A.Y. 2016/17, 2017/18
- Co-supervision of two internships and one master thesis on biomedical engineering (Dissertation October 2019)

University of Palermo, Palermo, Italy

21 December 2019

- "*Stima della connettività cerebrale e delle interazioni fisiologiche in bioelettronica e bioingegneria*", seminar lecture

Awards and Achievements

- Grant for the project *Avvio alla Ricerca* (AR11916B88F7079E) titled "*Development of a new approach based on Information Theory and machine learning for the detection of physiological states in humans*" funded by University of Rome "La Sapienza", 2019.
- Grant for the project *Avvio alla Ricerca* (AR1181643695F5CD) titled "*Development of a toolbox based on Artificial Neural Network, for monitoring the effects on brain networks of a BCI-based rehabilitation treatment in stroke patients*" funded by University of Rome "La Sapienza", 2018.
- Grant for the project *Avvio alla Ricerca* (AR11715C82385545) titled "*Development of a Brain Computer Interface system based on brain functional connectivity for rehabilitation applications*" funded by University of Rome "La Sapienza", 2017.
- Student award received from Brain Computer Interface Society, 2018
- "*Awards for best master thesis on disability theme*" received from University of Rome "La Sapienza", A.Y. 2014/2015.

Participation in Research Projects

Principal Investigator for the following projects:

- *Avvio alla Ricerca* (AR11916B88F7079E) titled "*Development of a new approach based on Information Theory and machine learning for the detection of physiological states in humans*" funded by University of Rome "La Sapienza", 2019.

- *Avvio alla Ricerca* (AR1181643695F5CD) titled "*Development of a toolbox based on Artificial Neural Network, for monitoring the effects on brain networks of a BCI-based rehabilitation treatment in stroke patients*" funded by University of Rome "La Sapienza", 2018.
- *Avvio alla Ricerca* (AR11715C82385545) titled "*Development of a Brain Computer Interface system based on brain functional connectivity for rehabilitation applications*" funded by University of Rome "La Sapienza", 2017.

Participant in the following projects:

- PRIN (U-GOV PRJ-0167) titled "*Stochastic Forecasting in complex systems*" funded by the Italian Ministry of education. P.I: Prof. Rosario Nunzio Mantegna, 2020
- *Progetti di Ateneo* (RP11816436CDA44C) titled "*Sviluppo di algoritmi per l'analisi di potenziali evento-correlati in presenza di jitter*" funded by University of Rome "La Sapienza". P.I: Prof. Laura Astolfi, 2018
- *Progetti di Ateneo* (RM11715C82606455) titled "*EMBRACING: Estimating Multiple-Brain connectivity in Autism during Cooperative Interaction: anew tool for real-time hyperscanning*" funded by University of Rome "La Sapienza". P.I: Prof. Laura Astolfi, 2017

Participation to Conferences and Scientific Meetings

- 28th European Signal Processing Conference (EUSIPCO), was held virtually, 7 December 2020.
- 11th conference of the European Study Group on Cardiovascular Oscillations (ESGCO), 15 July 2020.
- 42th Annual International Conference of the IEEE, EMBS, was held virtually, 20-24 July 2020.
- 41th Annual International Conference of the IEEE, EMBS, Berlin, Germany, 23-27 July 2020.
- 2019 OHBM Annual meeting, Rome, Italy, 9-13 June 2019.
- "*XIX Workshop on convex optimization in finance*", Rome, Italy, 15-23 January 2018.
- "*Winter School: Machine and Deep Learning for Neurological Diseases*", Pavia, 3-7 December 2018
- "*First International Summer Institute on Network Physiology – ISINP*", Como, Italy, 24-29 July 2017

Participation to Master classes

- "*Coding in Python and Machine Learning*", Rome, Italy, 20 hours, May-June 2019
- "*Frank-Wolfe variants for optimization over convex sets*", Rome, A.Y. 2016/17
- "*Advances in Bioengineering*", Rome, A.Y. 2016/17
- "*Technical Scientific writing*", Rome, A.Y. 2016/17

Editorial activity

Reviewer for different international journals

- see Publons profile: <https://publons.com/researcher/1578746/yuri-antonacci/>

Reviewer editor:

- Frontiers in Social Neuroergonomics
- Frontiers in Autonomic Neuroscience
- Frontiers in Fractal and Network Physiology

Software

I release MatLab codes which implement algorithms for biomedical data analysis and signal processing developed during my research activity (see <https://github.com/YuriAntonacci>)

- 2020: **PID-LASSO** - Matlab Tool for the computation of Partial Information Decomposition and conditional Granger Causality based on LASSO parametric Identification
- 2020: **ANN-GC** - Matlab Tool for the computation of conditional and unconditional Granger Causality based on the combination of state-space models and Artificial neural networks
- 2020: **S-MVAR** - Matlab Tool for the identification procedure of Multivariate Autoregressive models with different penalized regression techniques (under development)

Personal Skills and Competences

Mother Tongue: Italian **Other Languages:** English

- Intensive course of four weeks general English, Purley Languages School, London, UK (Level achieved: C1)
- general English course, Darcy School of Languages, Rome, Italy (Level achieved: B2)

Computer Skills

- Excellent knowledge of MatLab environment (daily use)
- good knowledge of LaTeX environment (daily use)
- good knowledge of Python environment (occasional use)
- Competent with the most programs of the Microsoft Office Suite

Technical skills

- Competent with EEG acquisition devices such as BrainAmp, gTech.
- good knowledge of software for the analysis of brain signals such as EEGLab and BrainVision Analyzer
- Competent with technologies used for the fabrication of micro electric mechanic systems (mems) such as sputtering, reactive ion etching and photo-lithography