

Curriculum Vitae

INFORMAZIONI PERSONALI

Nome YURI
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FORMAZIONE TITOLI

EDUCATION

- 2016: Master degree in Biomedical Engineering (cum laude) at the University of Rome "La Sapienza", Rome, Italy
- 2021. PhD degree in Bioengineering at the University of Rome "La Sapienza", Rome, Italy

PROFESSIONAL EXPERIENCE

- 2020-present: Research Fellow at the Department of Physics and Chemistry "Emilio Segrè", University of Palermo, Palermo, Italy
- 2016-2021: PhD Student in Bioengineering at the Department of Computer, Control and Management Engineering at University of Rome "La Sapienza", Rome, Italy
- Sep. 2019- Dec. 2019: Visiting Researcher, Department of Engineering, University of Palermo, Palermo, Italy
- Jan. 2017-Oct. 2017: Fellowship at IRCSS Fondazione Santa Lucia, Rome, Italy
- June 2016- Oct. 2016: Fellowship at the Department of Computer, Control and Management Engineering at University of Rome "La Sapienza", Rome, Italy

ATTIVITA' DIDATTICA

Teaching Activity

- 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, 2019/2020
- 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
- Trainer for the project: "Coding Girls 2020". (14 hours of teaching activity)
- Seminar and tutorials for the laboratory of PNLs Computational Physics. University of Palermo
- Adjunct Professor in Biomedical Engineering: "Elaborazione di dati e segnali biomedici" (6 CFU, ING-INF/06). University of Palermo (CL)

Lectures and Seminars

- Dec 2019: Department of Engineering, University of Palermo, Stima della connettività cerebrale e delle interazioni fisiologiche in bioelettronica e bioingegneria.
- Apr 2021: Department of Engineering, University of Palermo, Metodi di ricostruzione di reti fisiologiche.

Tutoring of Master Students

- 2018: Rosa Del Vecchio, Biomedical Engineering, University of Rome "La Sapienza", Italy
- 2021: Paolo Giaccone, Martina Fricano, Biomedical Engineering, University of Palermo, Italy

RICERCHE FINANZIATE

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 (RM120172B8899B8C) titled "MOVE: Multimodal framework for the eValuation of upper-limb motor impairment and its rEcovery in stroke patients" funded by University of Rome "La Sapienza". P.I: Prof. Febo Cincotti, 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: a new tool for real-time hyperscanning" funded by University of Rome "La Sapienza". P.I: Prof. Laura Astolfi, 2017

ASSOCIAZIONI SCIENTIFICHE

Subscription to Scientific Societies

- 2016-2021: "IEEE Engineering in Medicine and Biology Society", Member
- 2016-2018: "Gruppo Nazionale di Bioingegneria", Member
- 2016-2019: "Brain Computer Interface Society", Member

PUBBLICAZIONE

- Total publications: **20**
- Articles in peer-reviewed indexed journals: **10** (first author: **3**)
- Articles in peer-reviewed indexed conference Proceedings: **10** (first author: **7**)
- Other articles in Conference Proceedings: **6** (first author: **4**)
- total citations received: **77**
- Hirsch Index: **h=5**

Articles in Peer-reviewed indexed journals

1. **Y. Antonacci**, L. Astolfi, G. Nollo, L. Faes, "Information Transfer in Linear Multivariate Processes Assessed through Penalized Regression Techniques: Validation and Application to Physiological Networks". *Entropy*, vol. 22, no. 7, pp. 732, 2020. DOI: [10.3390/e22070732](https://doi.org/10.3390/e22070732)
2. L. Faes, R. Pernice, G. Mijatovic, **Y. Antonacci**, J. Krohova, M. Javorka, A. Porta, "Information Decomposition in the Frequency Domain: a New Framework to Study Cardiovascular and Cardiorespiratory Oscillations", *Philosophical Transactions of the Royal Society A (PTRSA)*, 2020. DOI: <https://doi.org/10.1098/rsta.2020.0250>
3. R. Pernice, **Y. Antonacci**, M. Zanetti, A. Busacca, D. Marinazzo, L. Faes and G. Nollo, "Multivariate Correlation Measures Reveal Structure and Strength of Brain-Body Physiological Networks at Rest and During Mental Stress", *Frontiers in Autonomic Neuroscience*, vol. 14, pp. 1427, 2020. DOI: [10.3389/fnins.2020.602584](https://doi.org/10.3389/fnins.2020.602584)
4. **Y. Antonacci**, L. Minati, L. Faes, R. Pernice, G. Nollo, L. Astolfi, J. Toppi, A. Pietrabissa, L. Astolfi, "Estimation of Granger causality through Artificial Neural Networks: applications to physiological systems and chaotic electronic oscillators", *PeerJ Computer Science*, 2021. DOI: [10.7717/peerj-cs.429](https://doi.org/10.7717/peerj-cs.429)
5. S. Stramaglia, T. Scagliarini, **Y. Antonacci**, L. Faes, "Local Granger causality", *Physical Review E*, vol. 103, no.2, pp. L020102, 2021. DOI: [10.1103/PhysRevE.103.L020102](https://doi.org/10.1103/PhysRevE.103.L020102)
6. G. Mijatovic, **Y. Antonacci**, T. Loncar-Turukalo, L. Minati, L. Faes, "An information-theoretic framework to measure the dynamic interaction between neural spike trains". *Transactions on Biomedical Engineering*, 2020. DOI: [10.1109/TBME.2021.3073833](https://doi.org/10.1109/TBME.2021.3073833)
7. de Felice G, Hyland ME, Lanario JW, **Antonacci Y**, Jones RC, Masoli M. Preliminary development of a questionnaire to measure the extra-pulmonary symptoms of severe asthma. *BMC Pulm Med*. 2021;21:369. Published 2021 Nov 14. doi:[10.1186/s12890-021-01730-0](https://doi.org/10.1186/s12890-021-01730-0)
8. **Y. Antonacci**, L. Minati, D. Nuzzi, G. Mijatovic, R. Pernice, D. Marinazzo, S. Stramaglia and L. Faes, "Measuring High-Order Interaction in Rhythmic Processes: A Framework for the Spectral Information Decomposition of Multiple Time Series", *IEEE Access*, vol. 9, pp. 149486-149505, 2021, doi: [10.1109/ACCESS.2021.3124601](https://doi.org/10.1109/ACCESS.2021.3124601).
9. G. Mijatovic, R. Pernice, A. Perinelli, **Y. Antonacci**, M. Javorka, L. Ricci and L. Faes, "Measuring the rate of information exchange in Point-Processes Data with Application to Cardiovascular Variability", *Front. Netw. Physiol.*, 2021
10. R. Pernice, L. Sparacino, V. Bari, F. Gelpi, B. Cairo, G. Mijatovic, **Y. Antonacci**, D. Tonon, G. Rossato, M. Javorka, A. Porta and L. Faes, "Spectral Decomposition of cerebrovascular and cardiovascular interactions in patients prone to postural syncope and healthy controls", *Autonomic Neuroscience: Basic and Clinical* (2021).

Articles in peer-reviewed indexed Conference Proceedings

1. J. Toppi, N. Sciaraffa, **Y. Antonacci**, A. Anzolin, S. Caschera, M. Petti, D. Mattia, L. Astolfi, "Measuring the Agreement between Brain Connectivity Networks". 2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL-USA, pp. 68-71, 2016. DOI: [10.1109/EMBC.2016.7590642](https://doi.org/10.1109/EMBC.2016.7590642)
2. **Y. Antonacci**, J. Toppi, S. Caschera, A. Anzolin, D. Mattia, L. Astolfi, "Estimating Brain Connectivity when few Data Points are Available: Perspective and Limitations". 2017 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Jeju, KR, pp. 4351-4354, 2017. DOI: [10.1109/EMBC.2017.8037819](https://doi.org/10.1109/EMBC.2017.8037819)
3. **Y. Antonacci**, J. Toppi, D. Mattia, A. Pietrabissa, L. Astolfi, "Single-trial Connectivity Estimation through the Least Absolute Shrinkage and Selection Operator", 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Berlin, DE, pp. 6422-6425, 2019. DOI: [10.1109/EMBC.2019.8857909](https://doi.org/10.1109/EMBC.2019.8857909)

4. **Y. Antonacci**, J. Toppi, D. Mattia, A. Pietrabissa, L. Astolfi, "Estimation of brain connectivity through Artificial Neural Networks", 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Berlin, DE, pp. 636-639, 2019. DOI: [10.1109/EMBC.2019.8856585](https://doi.org/10.1109/EMBC.2019.8856585)
5. **Y. Antonacci**, L. Astolfi, A. Busacca, R. Pernice, G. Nollo and L. Faes, "Model-Based Transfer Entropy Analysis of Brain-Body Interactions with Penalized regression techniques", 2020 11th Conference of the European Study Group on Cardiovascular Oscillations (ESGCO), Pisa, IT, pp. 940-944, 2021. DOI: [10.1109/ESGCO49734.2020.9158165](https://doi.org/10.1109/ESGCO49734.2020.9158165)
6. **Y. Antonacci**, L. Faes and L. Astolfi. "Information Dynamics Analysis: A new approach based on Sparse Identification of Linear Parametric Models ", 2020 42st Annual International Conference of the IEEE Engineering in -Medicine and Biology Society (EMBC), Montreal, CA, pp. 26-29, 2020. DOI: [10.1109/EMBC44109.2020.9176114](https://doi.org/10.1109/EMBC44109.2020.9176114)
7. **Y. Antonacci**, L. Astolfi and L. Faes, "Testing different methodologies for Granger causality estimation: A simulation study," 2020 28th European Signal Processing Conference (EUSIPCO), Amsterdam, NE, 2021, pp. 940-944, DOI: [10.23919/Eusipco47968.2020.9287405](https://doi.org/10.23919/Eusipco47968.2020.9287405)
8. **Y. Antonacci**, L. Minati, G. Mijatovic and L. Faes, "A new Framework for the Spectral Information Decomposition of Multivariate Gaussian Processes," 2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 2021, pp. 182-185, doi: [10.1109/EMBC46164.2021.9630952](https://doi.org/10.1109/EMBC46164.2021.9630952).
9. G. Mijatovic, **Y. Antonacci**, L. Faes, "Measuring the Rate of Information Transfer in Point-Process Data: Application to Cardiovascular Interactions," 2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 2021, pp. 341-344, DOI: [10.1109/EMBC46164.2021.9629688](https://doi.org/10.1109/EMBC46164.2021.9629688)
10. G. De Felice, M. Hyland, J. Lanario, **Y. Antonacci**, R. Jones, M. Masoli, "A questionnaire to measure the extra-pulmonary symptoms of asthma", European Respiratory Journal 2021 58: PA 1097, 2021. DOI: [10.1183/13993003.congress-2021.PA1097](https://doi.org/10.1183/13993003.congress-2021.PA1097)

Other Articles in Conference Proceedings

1. **Y. Antonacci**, D. Caputo, G. De Cesare, A. Nascetti, R. Scipinotti, "Integration of amorphous silicon photosensors with an electrowetting-on-device system". Giornata del Gruppo Sensori della SCI e della SIOF, Sestri Levante (Italy), 19-20 September, 2013
2. J. Toppi, **Y. Antonacci**, D. Mattia, L. Astolfi. "Towards Real Time Connectivity Estimation: a New Approach Based on Ridge Regression". V Congresso Nazionale di Bioingegneria, Napoli (Italy), 20-22 June, 2016.
3. **Y. Antonacci**, J. Toppi, A. Pietrabissa, F. Cincotti, D. Mattia, L. Astolfi, "How does multicollinearity affect brain connectivity estimation? A simulation study based on penalized regression techniques", VI congresso Nazionale di Bioingegneria, Milano (Italy), 25-27 June, 2018.
4. **Y. Antonacci**, J. Toppi, A. Pietrabissa, F. Cincotti, D. Mattia, L. Astolfi, "Toward estimation of brain connectivity as new feature for BCI application", Seventh international BCI meeting, Pacific groove (CA-USA), 21-25 May, 2018
5. **Y. Antonacci**, J. Toppi, A. Pietrabissa, D. Mattia, L. Astolfi, "The estimation of Granger causality on single EEG trials by means of penalized regressions", 25th annual meeting of the organization of human brain mapping, Rome (Italy), 9-13 June, 2019
6. S. Monachino, **Y. Antonacci**, M. Paoli, L. Faes, A. Haase, "Functional and effective connectivity of early olfactory coding", Bernstein Conference, Online, 29 September-1 October 2020.

ATTIVITA' SCIENTIFICHE

Editorial Activity

reviewer for several international scientific journals. 1) IEEE Transactions on Biomedical Engineering; 2) Computational and Mathematical Methods in Medicine; 3) NeuroImage; 4) Frontiers in Physiology; 5) Brain Topography; 6) Computational Intelligence and Neuroscience; 7) Chaos (American Institute of Physics); 8) Frontiers in Human Neuroscience; 9) Medical Image Analysis; 10) Medical & Biological Engineering & Computing; 11) PeerJ Computer Science; 12) IEEE Transactions on Neural Systems and Rehabilitations Engineering; 13) International Journal of Environmental Research and Public Health; 14) International Conference of the IEEE Engineering in Medicine and Biology Society.

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

Participation in International Conferences

- "7th international BCI meeting", Pacific groove (CA-USA), 21-25 Maggio, 2018
- "25th annual meeting of the organization of human brain mapping", Rome (Italia), 9-13 Giugno, 2019
- "41st Engineering in medicine and biology Conference" (EMBC), Berlino (Germania), 23-27 Luglio, 2019
- "42st Engineering in medicine and biology Conference" (EMBC), Montreal (Canada), 20-24 Luglio 2020.
- "The 11th conference of the European Study Group on Cardiovascular Oscillations", (ESGCO), Pisa (Italia), 15 Luglio 2020.
- "28th European Signal Processing Conference" (EUSIPCO), Amsterdam (Olanda) , 18-22 Gennaio 2021.
- "43st Engineering in medicine and biology Conference" (EMBC), Guadalajara (Messico), 1-5 Novembre 2021.

AMBITI DI RICERCA

Development of methods for multivariate time series analysis in the time domain (prediction methods), frequency domain (spectral analysis) and information domain (entropy-based measures) for the description of the complexity of individual systems, the coupling between systems and their causal interaction. Applicative contexts: neurophysiology; brain connectivity; cognitive neuroscience; brain-heart interactions; network physiology.

ALTRE ATTIVITA

Software

I released Matlab code which implements different algorithms for time series analysis with different applications on biomedical signal processing developed during my research activity (<https://github.com/YuriAntonacci>)

- PID-LASSO-toolbox: Matlab Tool for the computation of Partial Information Decomposition and conditional Granger Causality based on LASSO parametric Identification
- ANN-GC-toolbox: Matlab Tool for the computation of conditional and unconditional Granger Causality based on the combination of state-space models and Artificial neural networks
- S-MVAR-toolbox: Matlab Tool for the identification procedure of Multivariate Autoregressive models with different penalized regression technique
- fdIID-toolbox: Matlab Tool for a frequency-specific quantification of higher-order measures for the study of complex systems
- TEMI-toolbox: Matlab Tool for the evaluation of Transfer Entropy and Mutual Information Rate in continuous time with application to point-processes.