

PERSONAL INFORMATION Nicoletta Del Buono



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Female | 22/04/1974 | Italian

Enterprise	University	EPR
<input type="checkbox"/> Management Level	<input type="checkbox"/> Full professor	<input type="checkbox"/> Research Director and 1st level Technologist / First Researcher and 2nd level Technologist / Principal Investigator
<input type="checkbox"/> Mid-Management Level	<input checked="" type="checkbox"/> Associate Professor	<input type="checkbox"/> Level III Researcher and Technologist
<input type="checkbox"/> Employee / worker level	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

WORK EXPERIENCE

- Since 2011 Associate professor of Numerical Analysis at the Department of Mathematics of the University of Bari Aldo Moro where she takes teaching in Numerical Methods for Data Science, Numerical Methods for Optimization, Approximation Methods for undergraduate and master students in Mathematics, Computer Science and Data Science.
- Since-2017 Member of the Professors’ Committee of the Doctorate in Informatics and Mathematics at the University of Bari, she has been supervisor of three Ph.D. students.
- 2004-2016 Member of the Professors’ Committee of the Doctorate in Mathematics at the University of Bari. She has been supervisor of three Ph.D. students
- 2005-2006 January and February. Visiting Professor at the Department of Mathematics of North Carolina State University (NCSU), Raleigh, North Carolina, United States of America.
- Since 2003 Member of the Unione Matematica Italiana - INDAM
- Since 1999 Member of the National Group for the Scientific Calculus (GNCS)
- 2000-2011 Senior Researcher at Department of Mathematics of University of Bari
- 1997-2000 PhD Student at the Department of Mathematical Science, University of Bath, United Kingdom where she has been also Teaching assistant in Linear Algebra and Calculus for undergraduates’ students in Mathematics

EDUCATION AND TRAINING

- From 1997-2000 MPhil in Numerical Analysis
University of Bath, United Kingdom
Principal subjects covered: Multistep approximation of the asymptotic behaviour of dissipative evolution equations

1997 From 1992- M.Sc. degree “summa cum laude” in Mathematics
University of Bari, Italy

List of principal subjects covered or skills acquired:

- Numerical Methods for ODEs
- Scientific Computing and Applications
- Optimization Algorithms and Applications
- Approximation methods
- Programming

WORK ACTIVITIES

- Editorial activity** Guest Editors for Future Generation Computer Science, Elsevier from 2003 to 2006
Mathematics and Computer in Simulation, Elsevier in 2008, Discrete & Continuous
Dynamical Systems-Series B (DCDS-B) from 2016 to 2018, Mathematics, MDPI, from
2020.
- Invited presentations** - Meeting nazionale AiSDeT Bari, 24-26 November 2021: “Machine-Learning e
Intelligenza Artificiale per una migliore diagnosi e prognosi per i pazienti onco-
ematologici”
- 3rd Summer School in "Mathematical Methods in Data Science", Bari 12-16 July 2021:
“Analisi delle Componenti Principali e applicazioni in Biomedicina”.
- 2nd Summer School in "Mathematical Methods in Data Science", Bari 15-19 July 2019:
“Analisi delle Componenti Principali e applicazioni in Data Science”
- Grant** - “Repurposing marine by-products or raw materials for the development and production
of functional foods and bioactives to improve human health and coastal community
sustainability”, PI Prof. Raymond Thomas, financed by New Frontiers in Research Fund-
NFRF Canada, 2021-2026. Role: Co-Leader of the Work-Package (WP8) “Informatics of
marine biomass, rural or aboriginal community assets and value-added products”.
- Horizon Europe Seeds project “L’intelligenza artificiale a tutela della salute in età
pediatrica. Implementazione di una piattaforma digitale per il design di farmaci pediatrici
sicuri”, Principal Investigator: Prof. O. Nicolotti. Financed by University of Bari Aldo
Moro, Italy. Role: Key Area Person
- “Modelli Matematici Discontinui per l’Analisi delle Reti di Geni: Applicazioni al
Diabete”, 2012-2013, financed by Fondazione Cassa di Risparmio di Puglia and Regione
Puglia (Rete di Laboratori Pubblici di Ricerca WAFITECH-cod. 09), Role: Co-Principal
Investigator

PUBLICATIONS

Total number of publications in peer-review journals: **60** (indexed by Scopus, 02/05/2022)

Total number of citations: **539**

H index: **14**

Publications in the last 5 years:

- 1) Del Buono, N., Esposito, F., Selicato, L. (2022). Toward a New Approach for Tuning Regularization Hyperparameter in NMF. Machine Learning, Optimization, and Data Science. LOD 2021. Lecture Notes in Computer Science, vol 13163. Springer, Cham. https://doi.org/10.1007/978-3-030-95467-3_36
- 2) Boccarelli A, Del Buono N, Esposito (2021) F. Colorectal cancer in Crohn's disease evaluated with genes belonging to fibroblasts of the intestinal mucosa selected by NMF. Pathol Res Pract. 2022 Jan;229: 153728. doi: 10.1016/j.prp.2021.153728. Epub 2021 Nov 29. PMID: 34953405.

Publications in the last 5 years

- 3) Boccarelli A, Del Buono N, Esposito F. (2021) Analysis of fibroblast genes selected by NMF to reveal the potential crosstalk between ulcerative colitis and colorectal cancer, *Experimental and Molecular Pathology*, <https://doi.org/10.1016/j.yexmp.2021.104713>
- 4) Selicato, L.; Esposito, F.; Gargano, G.; Vegliante, M.C.; Opinto, G.; Zaccaria, G.M.; Ciavarella, S.; Guarini, A.; Del Buono, N. (2021) A New Ensemble Method for Detecting Anomalies in Gene Expression Matrices. *Mathematics* **2021**, *9*, 882. <https://doi.org/10.3390/math9080882>
- 5) N. Del Buono, F. Esposito, L. Selicato, (2020) Methods for Hyperparameters Optimization in Learning Approaches: An Overview. Machine Learning, Optimization, and Data Science: 6th International Conference, LOD 2020, Lecture Notes in Computer Science, Revised Selected Papers, Part I Jul 2020 Pages 100-112 https://doi.org/10.1007/978-3-030-64583-0_11
- 6) M.T. Belachew and N. Del Buono (2020), Hybrid Projective Nonnegative Matrix Factorization based on α -Divergence: Image Feature Extraction and Data Clustering, *Applied Mathematics and Computation*, Vol. 369, 15 March 2020 (scopus: 2-s2.0-85074131817)
- 7) F. Esposito, A. Boccarelli, N. Del Buono, (2020) A new NMF framework for selecting biomarkers in the landscape of genes of heterogeneous cancer associated fibroblast populations, *Bioinformatics and Biology Insights*. 4: doi: 10.1177/1177932220906827
- 8) N. Del Buono, F. Esposito, N. Gillis (2019) Orthogonal Joint Sparse NMF for Microarray Data Analysis, *J. Math. Biol.* (2019) 79: 223. <https://doi.org/10.1007/s00285-019-01355-2>
- 9) A. Boccarelli, F. Esposito, M. Coluccia, M. A. Frassanito, A. Vacca, N. Del Buono, (2018), Improving knowledge on the activation of bone marrow fibroblasts in MGUS and MM disease through the automatic extraction of genes via a Nonnegative Matrix Factorization approach on gene expression profiles, *J. Transl. Med.* 2018 Aug 3;16(1):217. doi: 10.1186/s12967-018-1589-1
- 10) A. Colombo N. Del Buono, L. Lopez, A. Pugliese (2018) Computational approaches to locate crossing/sliding regions and their basins of attraction of non-smooth dynamical systems, *Discrete & Continuous Dynamical Systems - B*, 2018, 23 (7), page 2911-2934, doi: [10.3934/dcdsb.2018166](https://doi.org/10.3934/dcdsb.2018166)
- 11) G. Casalino, C. Castiello, N. Del Buono, C. Mencar, (2018) A Framework for Intelligent Twitter Data Analysis with Nonnegative Matrix Factorization, *International Journal of Web Information Systems*, 2018, doi: 10.1108/IJWIS-11-2017-0081, 2018
- 12) Belachew, M.T., N. Del Buono (2017) A Dynamical System Approach for Continuous Nonnegative Matrix Factorization, *Mediterr. J. Math.* 14:14. doi:10.1007/s00009-016-0837-y
- 13) G. Calamita, P. Gena, N. Del Buono, M. D'Abbicco, M. Mastrodonato, M. Berardi, M. Svelto, L. Lopez (2017), Dynamical modeling of liver Aquaporin-9 expression and glycerol permeability in hepatic glucose metabolism, *European Journal of Cell Biology*, <http://dx.doi.org/10.1016/j.ejcb.2016.12.003>
- 14) Del Buono, N., Esposito, F., Fumarola, F., Boccarelli, A., Coluccia, M. (2016). Breast Cancer's Microarray Data: Pattern Discovery Using Nonnegative Matrix Factorizations. In: Pardalos, P., Conca, P., Giuffrida, G., Nicosia, G. (eds) *Machine Learning, Optimization, and Big Data. MOD 2016. Lecture Notes in Computer Science*, vol 10122. Springer, Cham. https://doi.org/10.1007/978-3-319-51469-7_24
- 15) M. T. Belachew, N. Del Buono (2016) Robust Embedded Projective Nonnegative Matrix Factorization for Image Analysis, *Pattern Anal Applic*, 1-16, 2016 doi:10.1007/s10044-016-0545-z
- 16) M D'Abbicco, N Del Buono, P Gena, M Berardi, G Calamita, L Lopez (2016) A model for the hepatic glucose metabolism based on Hill and step functions, *J. Comp. App. Math.* 292, 746-759, 2016
- 17) Casalino, G., Del Buono, N., Mencar, C. (2016). Nonnegative Matrix Factorizations for Intelligent Data Analysis. In: Naik, G. (eds) *Non-negative Matrix Factorization Techniques. Signals and Communication Technology*. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-662-48331-2_2

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV

Bari, 02/05/2022.

