Curriculum Vitae
Maria Gabriella Cimoroni

Maria Gabriella Cimoroni received the M.S. degree in Mathematics in 1989 from the University of L'Aquila with score 110/110 cum laude. After graduation she attended the post-graduate Inter-University School of Perugia and the CNR Computational Mathematics School in Naples. Since 1994 she is Researcher in Numerical Analysis at University of L'Aquila where she teaches Numerical Analysis and Mathematics Complements.

Her research activities have been mostly devoted to new spline operators for approximation of functions, for numerical evaluation of Cauchy principal value integrals and for numerical solution of integro-differential equations. Her current research interests are new analytical and numerical methods for modulation algorithms applied to multilevel converters. She is author and co-author of papers published in international journals or in proceedings of international conferences.

In 2018, a paper presented in Japan at the sixth International Conference on Smart Grids (ICSG) of which she is co-author, received the award for the best paper.

She has been member of the Phd Committee on "Systems and methods for the management of electrical and thermal energy from renewable and assimilated sources and for sustainable building" of DISIM Department of University of L'Aquila from 2012 to 2013.

She is a reviewer for some international journals, between them IEEE Transactions on Industrial Electronics. Since 2018 she is component of Scientific Committees of AEIT- Automotive. In particular, in 2019, she has been component of Technical Committee of 111-th 2019 AEIT International Conference in Florence and co-organizer (publicity chair) of 5th International Symposium on Environment Friendly Energies and Application (EFEA 2018) in Rome. In 2016 she has been co-organizer (publication co-chair) of 42th Annual International Conference of the IEEE Industrial Electronics Society (IECON 2016 -IEEE-IES) in Florence.

Journal papers

[1] C. Buccella; M. G. Cimoroni; C. Cecati, Mathematical Proof of a harmonic elimination procedure for multilevel inverters, *Mathematics and Computers in Simulations* (MATCOM, ScienceDirect, 2020 Elsevier), 2021, Vol. 184, p. 69-81.

[2] C. Buccella; M. G. Cimoroni; C. Cecati, Selective Harmonics Elimination Modulation for HVDC Modular Multilevel Converter, 2021 AEIT HVDC International Conference, 27-28 Maggio 2021, Genoa, Italy.

[3] C. Buccella; M. G. Cimoroni; C. Cecati, General Formula for SHE Problem Solution, *Energies MDPI*, 2020, 13, 3740, p. 1-16.

[4] C. Buccella; M. G. Cimoroni; C. Cecati, Mathematical Procedure for Harmonic Elimination in CHB Multilevel Inverters with Variable DC Sources, *Springer Nature Switzerland AG 2020, W. Zamboni, G. Petrone (eds.), ELECTRIMACS 2019, Lecture Notes in Electrical Engineering 697, Springer*, Selected Papers - Vol. 2, p. 303-315.

[5] C. Buccella; C. Cecati; M.G. Cimoroni, Selective Harmonics Elimination for Nine Level Inverter Based on Linear System Solution, 2020 2nd IEEE International Conference on Industrial Electronics for Sustainable Energy Systems (IESES), 1-3 Sept. 2020, Cagliari, Italy.

[6] C. Buccella; C. Cecati; M.G. Cimoroni; R. Miceli; G. Schettino; V. Castiglia; F. Pellitteri, Harmonic Reduction in CHB 13-level Inverters by PAM Fundamental-Frequency Strategy, 2019 8th International Conference on Renewable Energy Research and Applications (ICRERA), 3-6 Nov. 2019, Brasov, Romania.

[7] C. Buccella; M. G. Cimoroni; M. Tinari; C. Cecati, Seven-level cascaded inverters for Uninterruptible Power Supply (UPS) applications, 2019 45th Annual Conference of the IEEE Industrial Electronics Society (IECON), 14-17 Oct. 2019, Lisbon, Portugal.

[8] A. M. Saif; C. Buccella; M. G. Cimoroni; C. Cecati, Power Quality Improvement for Chopper-Cell Based Modular Multilevel Converters, 2019 AEIT International Annual Conference (AEIT), 18-20 September 2019, Florence, Italy.

[9] C. Buccella; M. G. Cimoroni; C. Cecati, A comparison between real-time harmonic elimination procedures for single phase CHB 5-level inverter, 2019 21st European Conference on Power Electronics and Applications (EPE '19 ECCE Europe) , 3-5 September 2019, Genova, Italy.

[10] C. Buccella, M. G. Cimoroni, M. Tinari, C. Cecati, A New Pulse Active Width Modulation for Multilevel Converters, *IEEE Transactions on Power Electronics*, August 2019, Vol. 34, Issue 8, p. 7221-7229.

[11] C. Buccella; M. G. Cimoroni; V. Patel, M. Tinari; C. Cecati, Investigation about SHM-PAM procedure for grid connected CHB seven level inverters, 2019 International Conference on Clean Electrical Power (ICCEP) , 2-4 July 2019, Otranto, Italy.

[12] V. Castiglia; R. Miceli; G. Ala; C. Cecati; C. Buccella; M. G. Cimoroni, A 9-level three-phase multilevel converter with harmonic mitigation and integrated battery balancing, 2019 AEIT International Conference of Electrical and Electronic Technologies for Automotive (AEIT Automotive), 2-4 July 2019, Torino, Italy.

[13]   C. Buccella; M. G. Cimoroni; C. Cecati, Low-Frequency Harmonic Elimination Technique in Three Phase Cascaded H-Bridges Multilevel Inverters for Renewable Energy Applications, *International Journal of Smart Grid*, Vol.3, No.1, March 2019.

[14]   C. Buccella, C. Cecati, M. G. Cimoroni, Hassan A. Khalid, Chebyshev Partition-Based Modulation Technique Applied to Power Converters, IEEE Journal of Emerging and Selected Topics in Power Electronics, Vol. 7, Issue 1, March 2019, p. 414-421.

[15]   C. Buccella, M. G. Cimoroni, M. Tinari, C. Cecati, S. A. Rizzo; G. Susinni; A. Raciti, *Single-Phase Chebyshev Algorithm for Harmonics Mitigation in CHB Five-Level Inverters* 2018 AEIT International Annual Conference, Bari, 3-5 Ottobre 2018.

[16]   C. Buccella; M. G. Cimoroni; V. Patel; A. M. Saif; M. Tinari; C. Cecati; E. Babaei, Harmonic elimination procedure for cascaded multilevel inverters having a particular even number of dc sources, IECON 2018 - 44th Annual Conference of the IEEE Industrial Electronics Society, 21-23 October 2018, Washington, DC, USA.

[17]   V. Castiglia; R. Miceli; G. Schettino; M. G. Cimoroni; C. Buccella; C. Cecati, Selective Harmonic Elimination in a 5-Level Single Phase Converter with FPGA Based Controller, 2018 5th International Symposium on Environment-Friendly Energies and Applications (EFEA), 24-26 October 2018, Rome, Italy.

[18]   C. Buccella; C. Cecati; M.G. Cimoroni; A. Damiano; S. Korjani; M. Porru; A. Serpi, *A Cascade Multilevel Configuration for Commercial Transport Aircraft,* 2018 AEIT International Annual Conference, Bari, 3-5 Ottobre 2018.

[19]   V. Castiglia; R. Miceli; G. Schettino; F. Viola; C. Buccella; C. Cecati; M. C. Cimoroni, Mixed Harmonic Elimination Control for a Single-Phase 9 Level Grid-Connected Inverter, 2018 International Conference on Smart Grid (icSmartGrid), 4-6 December 2018, Nagasaky, Japan (Best paper in the Conference).

[20]   F. Chabni; R. Taleb; M. G. Cimoroni; C. Buccella, Selective Harmonic Elimination Procedure for Uniform Step Asymmetrical 7-Level CHB Inverter, 2018 5th International Symposium on Environment-Friendly Energies and Applications (EFEA), 24-26 September 2018, Rome, Italy.

[21]   M. G. Cimoroni, M. Tinari, C. Buccella, C. Cecati, *A high efficiency Selective Harmonic Elimination technique for multilevel converters*, 2018 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2018, Amalfi, Italy, 20-22 June 2018, p. 673-677.

[22]   C. Buccella, M. G. Cimoroni, C. Cecati, E. Babaei, *Comparison between harmonic reduction procedures for 5-level inverters*, AEIT International Annual Conference, 2017, Cagliari, Italy, 20-22 Sept. 2017, p. 1-6.

[23]   C. Buccella, C. Cecati, M.G. Cimoroni, G. Kulothungan, A. Edpugnanti, A. K. Rathore, *A Selective Harmonic Elimination method for Multilevel Converters for Distributed generation*. IEEE Journal of Emerging and Selected Topics in Power Electronics, June 2017, Vol. 5, issue 2, p. 775-783.

[24]   C. Buccella, M.G. Cimoroni, H. Latafat, M. Tinari. C. Cecati, *Mixed harmonic elimination and reduction technique for single phase nine level converters,* ISIE 2017, Industrial Electronics (ISIE), 2017 IEEE 26th International Symposium on , Edinburgh, UK, 19-21 June 2017, p. 756-761.

[25]   C. Buccella, M.G. Cimoroni, V. Castiglia, R. Miceli, G. Schettino, C. Cecati, *Graphical THD minimization procedure for single phase five-level converters*, Industrial Electronics (ISIE), 2017 IEEE 26th International Symposium on , Edinburgh, UK, 19-21 June 2017, p. 733-738.

[26]   C. Buccella, M.G. Cimoroni, H. Latafat, G. Graditi, R. Yang, *Selective harmonic elimination in a seven level cascaded multilevel inverter based on graphical analysis,* Industrial Electronics Society , IECON 2016 - 42nd Annual Conference of the IEEE, Firenze, 23-26 October 2016, p. 2563-2568.

[27]   C. Buccella, C. Cecati, M.G. Cimoroni, *SHE formulation for five level inverters with unequal DC sources*. International Conference on Industrial Technology (ICIT 2015), Seville,17-19 March 2015, p. 1167-1172.

[28]   C. Buccella, C. Cecati, M.G. Cimoroni, *Performance analysis and simulation of unbalanced DC sources five level inverter topology*. 2015 International Conference on Renewable Energy and Applications (ICRERA 2015), Palermo, 22-25 Nov. 2015, p. 1152-1156.

[29]   C. Buccella, C. Cecati, M.G. Cimoroni, K. Razi, *Analytical Method for Pattern Generation in Five-Level Cascaded H-bridge Inverters using Selective Harmonics Elimination*. IEEE Transactions on Industrial Electronics, 2014, Vol. 61, issue 11, p. 5811-5819.

[30]   C. Buccella, C. Cecati, M.G. Cimoroni, K. Razi, *A deterministic harmonics mitigation technique for five-level inverters*. IECON 2014 - 40th Annual Conference of the IEEE Industrial Electronics Society, Dallas, 29 Ottobre- 1 Novembre 2014, p. 1007-1013.

[31]   C. Buccella, C. Cecati, M.G. Cimoroni, K. Razi, *Harmonic mitigation technique for multilevel inverters in power systems* International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM 2014), Ischia, 18-20 Giugno 2014, p. 73-77.

[32]   C. Buccella, C. Cecati, M.G. Cimoroni, *Harmonics Elimination in 5-Level Converters Operating at Very Low Switching Frequency*. IEEE International Conference on Industrial Technologies (ICIT 2013) - Conference Proceedings. Cape Town (South Africa), 25-28 February 2013, p. 1946-1951.

[33]   C. Buccella, C. Cecati, M.G. Cimoroni, P. Siano, *An Analytical Algorithm for Selective Harmonics Elimination and Efficient Control in 5-Level Inverters* (ISIE 2013), Taipei (Taiwan), 28-31 Maggio 2013.   IEEE International Symposium on Industrial Electronics, p. 1-6.

[34]   C. Buccella, C. Cecati, M.G. Cimoroni, K. Razi, *Real-time Harmonics Elimination Procedures for High-Power Converters*, IEEE International Workshop on Intelligent Energy Systems (IWIES 2013), Conf. Proc. IWIES 2013, Vienna, 14 Novembre 2013, p.179-184.

[35]   C. Buccella, C. Cecati, M.G. Cimoroni, *Investigation About Numerical Methods for Selective Harmonics Elimination in Cascaded Multilevel Inverters* . In: Proc. of ESARS. Bologna, 16-18 Ottobre 2012, Piscataway (NJ):IEEE 2012 Electrical Systems for Aircraft, Railway and Ship Propulsion (ESARS 2012), p. 1-6.

[36]   C. Buccella, C. Cecati, M.G. Cimoroni, P. Giammatteo, H. A. Khalid, H. Latafat, K. Razi, A. Ul-Haq, *Smart Bi-directional Interface for EVs with Market-based Energy Flow Management and Smart Grid Stabilization Capabilities, The terawatt challenge: what research for our future energy?* Accademia Nazionale dei Lincei – Fondazione ENI Enrico Mattei XXXI Giornata dell'Ambiente, Convegno Internazionale. Roma, 5 - 6 Novembre 2013.

[37]   C. Buccella, C. Cecati, M. J. Chaudhriy, M.G. Cimoroni, P. Giammatteo, H. A. Khalid, H. Latafat, K. Razi, A. Ul-Haq, *Smart Square*, Invited Project. Innovact Forum, Reims, France. Reims, France, March 26-27, 2013.

[38]   M.G. Cimoroni, *Quasi-interpolatory and interpolatory spline operators: some applications.* Studia Universitatis Babes-Bolyai. Mathematica, vol. LIII, p. 35-49, 2008.

[39]   M.G. Cimoroni, E. Santi, *Some new convergence results and applications of a class of interpolating-derivative splines,* Rendiconti del Seminario Matematico, vol. 64 (2), p. 143-157, 2006.

[40]   M.G. Cimoroni, G. Micula, E. Santi, *A class of even degree splines obtained through a minimum condition*. Studia Universitatis Babes-Bolyai. Mathematica, vol. 3, p. 93-104, ISSN: 0252-1938, 2003.

[41]   M.G. Cimoroni, E. Santi, *On the convergence of projector-splines for the numerical evaluation of certain two-dimensional CPV integrals,* Journal of Computational Mathematics, vol. 20 (2), p. 113-120, ISSN: 0254-9409, 2002.

[42]   M.G. Cimoroni, L. Gori, E. Santi, *Projector-Splines in the Numerical Solution of Integro-Differential Equations,* Computers & Mathematics with Applications, vol. 35, No. 5, p. 107-116, ISSN: 0898-1221, 1998.

[43]   M.G. Cimoroni, *Numerical Evaluation of 2-D Cauchy Principal Value Integral based on Quasi-Interpolating Splines,* Approximation Theory and its Applications, vol. 13, n.4, p. 1-12, 1997.

[44]   M. G. Cimoroni, R. Sampalmieri, *Numerical Simulation of Fluid Structure Interaction*, Tecnica Italiana, vol. 3, p. 163-172, 1994.