

Curriculum vitae

PERSONAL INFORMATION



Giuseppe Campobello

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Google Scholar: https://scholar.google.com/citations?user=dYcmlrgAAAAJ&hl=it

Gender Male | Date of birth 19 November 1975 | Nationality Italian

Assistant Professor of Telecommunications **CURRENT POSITION** within the Department of Engineering, University of Messina, Messina, Italy

EDUCATION

Ph.D. in Advanced Technologies for Information Engineering 2001 - 2004 University of Messina, Italy

> Thesis title: On the design of reconfigurable circuits and systems for computer and telecommunications applications

Qualification date: 06 Feb. 2004

1994 – 2000 Laurea degree (B.Sc.+M.Sc.) in Electronic Engineering

University of Messina, Italy Thesis title: Hardware design for multidimensional and commodity supercomputers Qualification grade: 110/110 + Hons. Qualification date: 25 July 2000

Qualified to practice as Computer Systems and Network Analyst 1994 - 1995

ITIS G. Marconi, Messina, Italy Qualification grade: 60/60 Qualification date: 13 December 1995

Secondary School Diploma in Industrial Engineering 1989 - 1994

ITIS G. Marconi, Messina, Italy Qualification date: 10 October 1994

PROFESSIONAL AND TRAINING EXPERIENCE

July 2013 – April 2015 Commissioner

Member of the Technical Committee aimed at evaluating technical proposals of telecommunications operators for the "Development of a Radio Network for the Regional Emergency Health Service (118) of the Sicily Region"

European Regional Development Fund (FESR) Sicily 2007/2013 - Line of intervention 6.1.2.2.

Committee entrusted and coordinated by the hospital agency "Azienda Ospedaliera Ospedali Riuniti Piemonte-Papardo", C.da Papardo, Messina, Italy



Curriculum vitae

March 2005 – Dec. 2005	Technical scientific consultant
	Signo Motus srl, Str. Panoramica dello Stretto, 340, 98168, Messina, Italy Research and development activities aimed at the design of healthcare information and
	telecommunication infrastructures, as part of the european project HELLODOC (e-Ten n.517508).
March 2001 – present	Qualified to practice as Engineer.
	Since 2002 registered in the National Engineer's Register in the province of Messina, Italy.
09/1998 - 12/1998	Erasmus Traineeship (Leonardo Programme)
	GIP Ultrasons, University of Tours, Tours, France
	Training experience related to the design and development of sensorless control systems for brushless motors, in collaboration with STMicrolectronics
ACADEMIC EXPERIENCE	
Dec. 2006 - Present	Assistant Professor of Telecommunications (SSD ING-INF/03)
	within the Department of Engineering, University of Messina, Messina, Italy
Jan. 2008 – July 2014	Steering Committee Member of PhD Graduate Program
	in "Advanced technologies for optoelectronics, photonics and electromagnetic modeling" PhD Cycles from XXIII to XXVIII
	Supervisor of two Ph.D. students: Dr.Eng. Antonino Segreto (XXVII Cycle) and Dr.Eng. Orazio Giordano (XXVI Cycle)
Sept. 2003 – Dec. 2006	Adjunct Professor
	Faculty of Engineering, University of Messina, Messina, Italy
	Faculty of Sciences (MM.FF.NN), University of Messina, Messina, Italy
Jan. 2006 – Dec. 2006	Research Fellow
	Department of Mathematics and Informatics, University of Catania, Italy Computer Science (SSD INF01)
	Research topic: Genetic algorithms for Grid Networks
Jan. 2005 – Dec. 2005	Research Assistant
	Department of Industrial Chemistry and Materials Engineering, University of Messina, Italy
	Research topic: Telecommunication systems for multimodal transports; research activities as part of the national research project SINAVE.
June 2004 – Dec. 2004	Research Assistant
	Department of Physics and Advanced Physical Technologies, University of Messina, Italy
	Research topic: Asynchronous System-on-Chip Interconnect; research activities as part of the research project MEDEA, in collaboration with STMicroelectronics



TEACHING EXPERIENCE

Academic Years Bachelor of Science classes

2016/17 - present	Laboratory of Telecommunications, BSc in Electronics and Computer Engineering
2018/19 - 2020/21	Telecommunications, BSc in Electronics and Information Engineering
2010/11 - 2017/18	Fundamentals of Telecommunications, BSc in Electronics and Computer Engineering
2003/04 - 2009/10	Electrical Communications, BSc in Computer and Telecommunications Engineering
2003/04 - 2009/10	Electrical Communications, BSc in Electronic Engineering
2005/2006	Cryptography, BSc in Computer Science
2005/2006	Laboratory for Information Security, BSc in Computer Science
2005/2006	Laboratory for Information Security, BSc in Computer Science

Academic Years Master of Science classes

2020/21 – present	Wireless Sensor Networks, MSc in Electronic Engineering for Industry
2021/22 - present	Wireless Sensor Networks, MSc in Computer Science - Data Analysis (in english)
2011/12 - 2015/16	Wireless Communications, MSc in Electronic Engineering
2005/06 - 2010/11	Electrical Communications II, MSc in Computer Engineering
2004/05	Digital Systems Electronic II, MSc in Computer Engineering
2003/04	Communication Networks, MSc in Computer Science

Academic Years Ph.D. courses

2010/11 - 2012/13	Optoelectronic telecommunication systems, PhD in "Advanced technologies for optoelectron- ics, photonics and electromagnetic modeling", University of Messina, Italy
2007/08 - 2012/13	Laboratory for the experimentation of communication systems, PhD in "Advanced technologies for optoelectronics, photonics and electromagnetic modeling", University of Messina, Italy
2007/08 - 2008/2009	Control systems applied to microscopy, PhD in "Advanced technologies for optoelectronics, photonics and electromagnetic modeling", University of Messina, Italy
Academic Year	Other postgraduate teaching activities

- 2013/14 What is communication, Summer School of the Board of European Students of Technology (BEST)
- 2012/13 EHF field propagation and radiative structures, 2nd level Master of Engineering in "Micro- and Nano-technologies for Extra High Frequency (EHF) Applications"



RESEARCH EXPERIENCE

Since 2007 as tenure track researcher in Telecommunications of the University of Messina, and previously as research contract holder, Dr. Giuseppe Campobello collaborates and coordinates research activities in national and international projects.

The research activity, carried out in collaboration with national research institutions, is mainly focused on wireless sensor networks and signal processing techniques for the Industrial Internet of Things and biomedical applications.

Among the national scientific collaborations: the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), the National Research Council (CNR) and the National Institute for Nuclear Physics (INFN).

As part of these collaborations, he has contributed to the design and development of ICT platforms based on wireless sensor networks as well as to the development of algorithms and models based on both conventional paradigms and artificial intelligence techniques (neural networks, genetic algorithms and machine learning).

In particular, he has been involved in the design and development of wireless sensor networks for different application fields, which span from environmental monitoring to industrial automation as well as for archaeology and cultural heritage sites.

Previously, in collaboration with the STMicroelectronics and INFN, different research fields have been investigated, ranging from hardware design for system-on-chip to parallel and distributed systems.

He is head of the laboratory for Wireless Communications of the Department of Engineering at the University of Messina, Italy.

He is member of the Scientific Council of the National Telecommunications and Information Technologies Group (GTTI) and representitive of the GTTI Research Unit of the University of Messina.

He is the co-author of over sixty scientific papers published in international journals or presented in leading international conferences.

He is member of Technical Program Committees of international conferences (IEEE Symposium on Computers and Communications and IEEE Wireless Communications and Networking Conference) and serves as reviewer for several international journals (IEEE Transactions on Computers, IEEE Transactions on Communications, IEEE/ACM Transactions on Networking, IEEE Transactions on Instrumentation and Measurement). He is also member of the Institute of Electrical and Electronic Engineers (IEEE) and of the Microwave Engineering Center for Space Applications (MECSA).

RESEARCH PROJECTS

Scientific responsibilities in national and international research projects

Jan. 2020 - Dec. 2021 Development of an ICT platform for off-site costruction solutions aimed at energy requalification of buildings Role **Co-Principal Investigator** Description Research agreement in collaboration with the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA). Research activities related to the Electric System Research Programme (RdS), PTR2019-2021 Funded by the Italian Ministry of Economic Development (MSE) Jan. 2020 - Dec. 2021 Development of machine learning approaches for battery aging modeling **Co-Principal Investigator** Role Description Research agreement in collaboration with the National Research Council (CNR). Research activities related to the Electric System Research Programme (RdS), PTR2019-2021 Funded by the Italian Ministry of Economic Development (MSE) Integrated system for monitoring and protection of the urban, suburban and marine Jan. 2015 – May 2018 environment (MAGINOT)



Role	WP leader
Description	Research activities related to the design and development of an early-warning system (WP3.1).
	National Operational Program (PON) for Research and Competitiveness (PON01_02309)
	Funded by the Italian Ministry of Economic Development (MSE)
Oct. 2017 - Sept. 2018	Development of archiving, processing and analysis systems for data related to indus- trial electric motors
Role	Principal Investigator
Description	Research agreement in collaboration with the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA).
	Research activities related to the Electric System Research Programme (RdS), PTR2015-2018
	Funded by the Italian Ministry of Economic Development (MSE)
Oct. 2016 - Sept. 2017	Development of low-cost smart sensor networks for monitoring asynchronous electric motors in industrial environments
Role	Principal Investigator
Description	Research agreement in collaboration with the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA).
	Research activities related to the Electric System Research Programme (RdS), PTR2015-2018
	Funded by the Italian Ministry of Economic Development (MSE)
Oct. 2015 - Sept. 2016	Sensors and Actuator Networks for M2M projects
Role	Principal Investigator
Description	Research agreement in collaboration with the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA).
	Research activities related to the Electric System Research Programme (RdS), PTR2015-2018
	Funded by the Italian Ministry of Economic Development (MSE)
2008 – 2009	Study, analysis and implementation of routing algorithms for Wireless Mesh Networks
	based on Multi-path transmission techniques and Multi-description codes
Role	Principal Investigator
Description	Funded by the University of Messina within the University Research Program PRA2008-2009
2007 – 2008	High-speed parallel CRC circuits for error corrections (PARCRC)
Role	Principal Investigator
	Funded by Sensor Dynamics (Graz, Austria)
2006 - 2007	Study, analysis and implementation of routing algorithms for reducing energy con- sumption in Wireless Sensor Networks
Role	Principal Investigator
Description	Funded by the University of Messina within the University Research Program PRA2006
Apr. 2005 – Oct. 2006	Healthcare service linking tele-rehabilitation to disabled people and clinicians (HELLODOC)
Role	WP leader
Description	Research activities related to the design and development of an ICT platform for tele- rehabilitation. In collaboration with the Italian National Institute of Health (ISS, Rome, Italy), Signo Motus s.r.l. (Messina, Italy), Institut Guttman (Barcelona, Spain) and Nationaal Multiple Sclerose Centrum (Melsbrock, Belgium).
	Co-funded by the European Commission (e-Ten project n.517508)



Curriculum vitae

2003 - 2004	Design of asynchronous digital circuits for System-on-Chip
Role	Principal Investigator
Description	Funded by the University of Messina within the University Research Program PRA2003

PROFESSIONAL AND INSTITUTIONAL SERVICE

Editorial Activities

2021 – present	Lead Guest Editor of the Special Issue "Advanced Resonant Sensors and Signal Processing Techniques for IoT-Enabled Applications" (Internet of Things Section), Sensors, MDPI
2020 – present	Topic Editor and Member of the Topical Advisory Panel of Sensors (MDPI)
2019	Guest Editor of Journal of Sensors, Hindawi
2006 – present	He serves as reviewer for several international journals, among others

- IEEE TRANSACTIONS ON COMPUTERS (since 2006);
- IEEE TRANSACTIONS ON COMMUNICATIONS (since 2007);
- IEEE/ACM TRANSACTIONS ON NETWORKING (since 2009);
- IEEE SENSORS JOURNAL (since 2015);
- IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT (since 2019).

Technical Program Committee Membership

TPC member of leading international conferences, among others

- IEEE Wireless Communications and Networking Conference (WCNC 2021 and 2022)
- IEEE Symposium on Computers and Communications (ISCC 2016, 2017 and 2020)

Organizing and Chairing activities

- 2022 Member of the Organizing Committee and DEMO Chair of the 17th IEEE International Symposium on Medical Measurements and Applications (MeMeA) June 22-24 2022, Taormina, Italy)
- 2022 Co-organizer of the Special Session "Advanced Signal Processing Techniques for Contactless and Remote Health Monitoring Systems", IEEE International Symposium on Medical Measurements and Applications (MeMeA) June 22-24 2022, Taormina, Italy.
- 14-16 Sept. 2020 Co-organizer and Chair of the Special Session "Wireless Technologies, Signal Processing Algorithms and Measurement Techniques for the Industrial Internet of Things", 24th IMEKO TC-4 International Symposium, 14-16 Sept. 2020, Palermo, Italy.
- 20-23 June 2011 Member of the Organizing Committee of the GTTI 2011 annual meeting edition, June 20-23 2011, Taormina, Italy.

Invited lectures

14 – 22 March 2016 Invited Speaker at the 1st IEEE iternational conference on Advances in Magnetics (AIM), Bormio (Italy), 14-16 March 2016, with a lecture entitled "Spintronics, telecommunications and petascale computing: a necessary alliance".

Scientific Society Memberhips

Member of the Scientific Council of the National Telecommunications and Information Technologies Group (GTTI) Member of the Institute of Electrical and Electronic Engineers (IEEE) Member of the IEEE Signal Processing Society Member of the IEEE Communications Society

Member of the Microwave Engineering Center for Space Applications (MECSA)



PUBLICATIONS

Selected International Journals

- Z. Benomar, G. Campobello, A. Segreto, F. Battaglia et al., "A fog-based architecture for latencysensitive monitoring applications in industrial internet of things," *IEEE Internet of Things Journal*, 2021.
- [2] G. Campobello, A. Segreto, and N. Donato, "A novel low-complexity frequency estimation algorithm for industrial internet-of-things applications," *IEEE Trans. Instrum. Meas.*, vol. 70, pp. 1–10, 2021.
- [3] G. Campobello, D. Dell'Aquila, M. Russo, and A. Segreto, "Neuro-genetic programming for multigenre classification of music content," *Appl. Soft Comput.*, vol. 94, p. 106488, 2020.
- [4] Z. Marinkovic, G. Gugliandolo, M. Latino, G. Campobello et al., "Characterization and neural modeling of a microwave gas sensor for oxygen detection aimed at healthcare applications," *Sensors*, vol. 20, no. 24, p. 7150, 2020.
- [5] G. Gugliandolo, G. Campobello, P. P. Capra, S. Marino *et al.*, "A movement-tremors recorder for patients of neurodegenerative diseases," *IEEE Trans. Instrum. Meas.*, vol. 68, no. 5, pp. 1451–1457, 2019.
- [6] G. Campobello, A. Segreto, and S. Serrano, "Data gathering techniques for wireless sensor networks: A comparison," Int. J. Distributed Sens. Networks, vol. 12, pp. 4156358:1–4156358:17, 2016.
- [7] G. Campobello, L. Galluccio, S. Palazzo, and A. Leonardi, "A new generalized consensus problem and its crt-based solution," *IEEE Trans. Autom. Control.*, vol. 61, no. 3, pp. 754–759, 2016.
- [8] S. Serrano, G. Campobello, A. Leonardi, S. Palazzo, and L. Galluccio, "Voip traffic in wireless mesh networks: a mos-based routing scheme," *Wirel. Commun. Mob. Comput.*, vol. 16, no. 10, pp. 1192– 1208, 2016.
- [9] G. Campobello, O. Giordano, A. Segreto, and S. Serrano, "Comparison of local lossless compression algorithms for wireless sensor networks," *J. Netw. Comput. Appl.*, vol. 47, pp. 23–31, 2015.
- [10] G. Campobello, S. Serrano, L. Galluccio, and S. Palazzo, "Applying the chinese remainder theorem to data aggregation in wireless sensor networks," *IEEE Commun. Lett.*, vol. 17, no. 5, pp. 1000–1003, 2013.
- [11] G. Campobello, G. Patanè, and M. Russo, "On the complexity of min-max sorting networks," Inf. Sci., vol. 190, pp. 178–191, 2012.
- [12] G. Campobello, A. Leonardi, and S. Palazzo, "Improving energy saving and reliability in wireless sensor networks using a simple crt-based packet-forwarding solution," *IEEE/ACM Trans. Netw.*, vol. 20, no. 1, pp. 191–205, 2012.
- [13] G. Campobello, S. Serrano, A. Leonardi, and S. Palazzo, "Trade-offs between energy saving and reliability in low duty cycle wireless sensor networks using a packet splitting forwarding technique," *EURASIP J. Wirel. Commun. Netw.*, vol. 2010, 2010.
- [14] G. Scandurra, C. Ciofi, G. Campobello, and G. Cannatà, "On the calibration of DA converters based on r/betar ladder networks," *IEEE Trans. Instrum. Meas.*, vol. 58, no. 11, pp. 3901–3906, 2009.
- [15] G. Campobello, G. Patanè, and M. Russo, "An efficient algorithm for parallel distributed unsupervised learning," *Neurocomputing*, vol. 71, no. 13-15, pp. 2914–2928, 2008.
- [16] G. Campobello and M. Russo, "A scalable VLSI speed/area tunable sorting network," J. Syst. Archit., vol. 52, no. 10, pp. 589–602, 2006.
- [17] G. Campobello, M. Mantineo, G. Patanè, and M. Russo, "LBGS: a smart approach for very large data sets vector quantization," *Signal Process. Image Commun.*, vol. 20, no. 1, pp. 91–114, 2005.
- [18] G. Campobello, G. Patanè, and M. Russo, "Hardware for multiconnected networks: the design flow," *Inf. Sci.*, vol. 158, pp. 149–172, 2004.
- [19] G. Campobello, G. Patanè, and M. Russo, "Hardware for multiconnected networks: a case study," Inf. Sci., vol. 158, pp. 173–188, 2004.
- [20] G. Campobello, G. Patanè, and M. Russo, "Parallel CRC realization," IEEE Trans. Computers, vol. 52, no. 10, pp. 1312–1319, 2003.



Selected International Conferences

- G. Campobello, G. Gugliandolo, and N. Donato, "A simple and efficient near-lossless compression algorithm for multichannel EEG systems," in 29th European Signal Processing Conference, EUSIPCO 2021, Dublin, Ireland, August 23-27, 2021. IEEE, 2021, pp. 1150–1154.
- [2] G. Campobello, A. Quercia, G. Gugliandolo, A. Segreto et al., "An efficient near-lossless compression algorithm for multichannel EEG signals," in IEEE Int. Symp. on Medical Measurements and Applications, MeMeA 2021, Lausanne, Switzerland, June 23-25, 2021. IEEE, 2021, pp. 1–6.
- [3] G. Gugliandolo, G. Campobello, Z. Marinkovic, G. Crupi et al., "Development of a multi-transduction system for breath analysis in neurodegenerative diseases," in IEEE International Symposium on Medical Measurements and Applications, MeMeA 2021, Lausanne, Switzerland, June 23-25, 2021. IEEE, 2021, pp. 1–6.
- [4] G. Campobello, A. Altadonna, F. Todesco, and N. Donato, "IoT-MHECHA: A new IoT architecture for monitoring health and environmental parameters in cultural heritage and archaeological sites," in *Proceedings of the 2020 IMEKO TC-*4 International Conference on Metrology for Archaeology and Cultural Heritage Trento, Italy, October 22-24, 2020. IMEKO, 2020, pp. 287–292.
- [5] G. Campobello, A. Segreto, and N. Donato, "A new frequency estimation algorithm for iiot applications and lowcost instrumentation," in 2020 IEEE International Instrumentation and Measurement Technology Conference, I2MTC 2020, Dubrovnik, Croatia, May 25-28, 2020. IEEE, 2020, pp. 1–5.
- [6] Z. Benomar, G. Campobello, F. Longo, G. Merlino et al., "Fog-enabled industrial wsns to monitor asynchronous electric motors," in IEEE International Conference on Smart Computing, SMARTCOMP 2020, Bologna, Italy, September 14-17, 2020. IEEE, 2020, pp. 434–439.
- [7] G. Campobello and A. Segreto, "A low complexity image compression algorithm for iot multimedia applications," in 27th European Signal Processing Conference, EUSIPCO 2019, A Coruña, Spain, September 2-6, 2019. IEEE, 2019, pp. 1–5.
- [8] G. Campobello, A. Segreto, and N. Donato, "An experimental evaluation of crt-based forwarding technique," in 5th IEEE International Symposium on Measurements & Networking, M&N 2019, Catania, Italy, July 8-10, 2019. IEEE, 2019, pp. 1–6.
- [9] G. Campobello, A. Segreto, S. Zanafi, and S. Serrano, "An efficient lossless compression algorithm for electrocardiogram signals," in 26th European Signal Processing Conference, EUSIPCO 2018, Roma, Italy, September 3-7, 2018. IEEE, 2018, pp. 777–781.
- [10] G. Campobello, "Rethinking compressive sensing," in 26th European Signal Processing Conference, EUSIPCO 2018, Roma, Italy, September 3-7, 2018. IEEE, 2018, pp. 1765–1769.
- [11] G. Gugliandolo, A. Sciva, G. Campobello, P. P. Capra et al., "A movement monitoring system for patients of neurodegenerative diseases," in *IEEE International Instrumentation and Measurement Technology Conference, I2MTC 2018, Houston, TX, USA, May 14-17, 2018.* IEEE, 2018, pp. 1–6.
- [12] S. Hermann, L. Lombardo, G. Campobello, M. J. Burke et al., "A ballistocardiogram acquisition system for respiration and heart rate monitoring," in *IEEE International Instrumentation and Measurement Technology Conference, I2MTC* 2018, Houston, TX, USA, May 14-17, 2018. IEEE, 2018, pp. 1–5.
- [13] G. Campobello, M. Castano, A. Fucile, and A. Segreto, "WEVA: A complete solution for industrial internet of things," in Ad-hoc, Mobile, and Wireless Networks - 16th International Conference on Ad Hoc Networks and Wireless, ADHOC-NOW 2017, Messina, Italy, September 20-22, 2017, Proceedings, ser. Lecture Notes in Computer Science, vol. 10517. Springer, 2017, pp. 231–238.
- [14] G. Campobello, A. Segreto, S. Zanafi, and S. Serrano, "RAKE: A simple and efficient lossless compression algorithm for the internet of things," in 25th European Signal Processing Conference, EUSIPCO 2017, Kos, Greece, August 28 - September 2, 2017. IEEE, 2017, pp. 2581–2585.
- [15] A. Famulari, F. Longo, G. Campobello, T. Bonald *et al.*, "A simple architecture for secure and private data sharing solutions," in *IEEE Symposium on Computers and Communications, ISCC 2014, Funchal, Madeira, Portugal, June* 23-26, 2014. IEEE Computer Society, 2014, pp. 1–6.
- [16] M. Galeano, A. Calisto, A. Bramanti, F. Angileri *et al.*, "Classification of morphological features extracted from intracranial pressure recordings in the diagnosis of normal pressure hydrocephalus (NPH)," in 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC 2011, Boston, MA, USA, August 30 - Sept. 3, 2011. IEEE, 2011, pp. 2768–2771.
- [17] S. Serrano, G. Campobello, A. Leonardi, and S. Palazzo, "A mos-based routing approach for wireless mesh networks," in *Proceedings of IEEE International Conference on Communications, ICC 2011, Kyoto, Japan, 5-9 June,* 2011. IEEE, 2011, pp. 1–6.
- [18] G. Campobello, A. Leonardi, and S. Palazzo, "A novel reliable and energy-saving forwarding technique for wireless sensor networks," in *Proceedings of the 10th ACM Interational Symposium on Mobile Ad Hoc Networking and Computing, MobiHoc 2009, New Orleans, LA, USA, May 18-21, 2009*, E. W. Knightly, C. Chiasserini, and X. Lin, Eds. ACM, 2009, pp. 269–278.
- [19] G. Campobello, A. Leonardi, and S. Palazzo, "On the use of chinese remainder theorem for energy saving in wireless sensor networks," in *Proceedings of IEEE International Conference on Communications, ICC 2008, Beijing, China*, 19-23 May 2008. IEEE, 2008, pp. 2723–2727.
- [20] G. Campobello, M. Castano, C. Ciofi, and D. Mangano, "GALS networks on chip: a new solution for asynchronous delay-insensitive links," in *Proceedings of the Conference on Design, Automation and Test in Europe: Designers' Forum, DATE 2006, Munich, Germany, March 6-10, 2006*, G. G. E. Gielen, Ed. European Design and Automation Association, Leuven, Belgium, 2006, pp. 160–165.