Simone Buso

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Simone Buso was born in Padova on February 6th 1968. In 1992 he graduated "cum laude" in electronic engineering at the University of Padova, from which he also received, in 1996, the Ph.D. in Industrial Engineering.
In 1997, he joined the University of Padova as an assistant professor and researcher at the Department of Electronics and Computer Science (now Department of Information Engineering). In 2007 he was appointed associate professor of Electronics. After a few years with the Department of Management and Engineering (DTG), he is currently again with the Department of Information Engineering (DEI) of the University of Padova. Since 1997 he has been a member of the staff of the Power Electronics Research Group. The milestones of his education and career are summarized hereafter.

EDUCATION

1996 Ph.D. in Industrial Engineering from the University of Padova
1992 **"**Laurea" degree (cum laude) in Electronic Engineering from the University of Padova

CAREER

2012 – today Associate professor of Electronics at the University of Padova, Department of Information Engineering (DEI)
2006 - 2011 Associate professor of Electronics at the University of Padova, Department of Technology and Management (DTG)
1997 - 2006 Assistant professor at the University of Padova, Department of Information Engineering (DEI)

RESEARCH

The research activity of Simone Buso deals with different topics within the general field of industrial and power electronics. In particular, he has given contributions to the study of advanced control techniques for switching power supplies, to the development of innovative topologies for AC/DC power converters featuring unity power factor, and, more recently, to the development of power electronics systems for the efficient exploitation of renewable energy sources and their integration into smart micro-grids.
In more detail, in the early years of his career he has been interested in:

- advanced control techniques for DC/DC and AC/DC converters, with particular reference to robust, H_∞ and μ-synthesis based controllers;
- digital control of DC/AC e AC/DC converters, with an emphasis on current control techniques and multi-loop control of voltage source inverters, for applications like uninterruptible power supplies, active power filters and controller rectifiers;
- novel topologies of Power Factor Correctors, for both high and low switching frequency applications.

More recently, the focus of his research activity has moved towards the following topics:

- smart power integrated circuits, with particular reference to integrated DC-DC converters;
- electromagnetic compatibility of integrated circuits, like operational amplifiers and band-gap voltage reference circuits;
- solid state lighting, referring both to the high power LED technology and to the design of line-fed LED drivers;
- smart micro grids, in terms of both high level control strategies and low level energy gateway converter controllers.

Simone Buso is the author of two books, the inventor of the US patent n° US 7233113 B2 and, at the time of writing, the co-author of at least **151** technical papers, all presented at international conferences of the power

electronics area or published on the IEEE Transactions on, among others, Industry Applications, Industrial Electronics and Power Electronics.
Currently, his h-index is **27** according to *Scopus* and **31** according to *Google Scholar*. His papers have accumulated a total of **3387** citations, according to ISI Scopus, of **6349** citations, according to Google Scholar.
Simone Buso is a member of the IEEE, of the Industrial Electronics Society and of the Power Electronics Society. Since 1997, he serves as a reviewer for the IEEE Transactions on Power Electronics, Industry Applications and Industrial Electronics.

INDUSTRIAL CONSULTANCY

Over the years, Simone Buso has been a consultant to several national and international companies, including STM, HUAWEI, Infineon Technologies and small/medium local enterprises such as: Secondo Mona S.p.A., ATIB Elettronica Srl, Selco Engineering Srl, SOVEMA Group S.p.A., GDS S.p.A.

INTERNATIONAL CO-OPERATIONS

Since 1997, Simone Buso has visited and co-operated with different research groups worldwide.

He has been several times a visiting professor at the University of Campinas (SP), Brazil. During his stays (1999, 2001, 2011) he has co-operated with the electrical energy conditioning laboratory (LCEE) of the Department of Energy and Systems, DSE. Incidentally, thanks to his frequent visits to Brazilian academic institutions, he has also acquired a basic knowledge of the Portuguese language. Besides, beginning in the year 2000, he has been the supervisor, at the University of Padova, of a few Brazilian Ph.D. candidates.

He has also been the supervisor of a co-tutored Ph.D. research project (2006-2009) with the Polytechnical University of Tours (France), whose topic was the application of proton exchange membrane (PEM) fuel cells in electrical energy back-up systems and micro grids.

He has been co-operating (2009-2010) with the European Centre for Nuclear Research, CERN, Geneva, for the design of next generation point of load power supplies to be used in the SLHC experiment.

MOST RELEVANT PUBLICATIONS

Books

1. S. Buso, “Introduzione alle Applicazioni Industriali di Microcontrollori e DSP” – Esculapio – Bologna – 2015 – ISBN 9788874888399 – DOI 10.15651/978-88-748-8839-9
2. S. Buso, P. Mattavelli, “Digital Control in Power Electronics”, 2nd Edition, Morgan & Claypool Publishers, San Francisco, October 2015, ISBN 9781627057547, DOI: 10.2200/S00637ED1V01Y201503PEL007.

IEEE Transactions

1. Z. Petric, P. Mattavelli and S. Buso, "Passivation of Grid-Following VSCs: A Comparison between Active Damping and Multi-Sampled PWM”, IEEE Transactions on Power Electronics, vol. 37, no. 11, pp. 13205 – 13216, Nov. 2022, DOI: 10.1109/TPEL.2022.3181935.
2. Y. Zhang, S. Buso and T. Caldognetto, " A Flexible Energy Gateway for Hybrid Nanogrids”, IEEE Journal of Emerging and Selected Topics in Power Electronics, vol. 10, no. 5, pp. 5717 – 5726, Oct. 2022, DOI: 10.1109/JESTPE.2022.3169212.
3. R. Cvetanovic, I. Z. Petric, P. Mattavelli, S. Buso, “Accurate High-Frequency Modeling of the Input Admittance of PWM Grid-Connected VSCs”, IEEE Transactions on Power Electronics, vol. 37, no. 9, pp. 10534 – 10545, Sept. 2022, DOI: 10.1109/TPEL.2022.3171611.
4. G. Spiazzi, S. Buso, “An Isolated Soft-Switched High-Power-Factor Rectifier Based on the Asymmetrical Half-Bridge Flyback Converter”, IEEE Transactions on Industrial Electronics, vol. 69, no. 7, pp. 6722 – 6731, Jul. 2022, DOI: 10.1109/TIE.2021.3100975.
5. Z. Petric, P. Mattavelli and S. Buso, "Multi-Sampled Grid-Connected VSCs: A Path Toward Inherent Admittance Passivity”, IEEE Transactions on Power Electronics, vol. 37, no. 7, pp. 7675 – 7687, Jul. 2022, DOI: 10.1109/TPEL.2022.3145191.
6. Y. Zhang, G. Spiazzi, S. Buso and T. Caldognetto, "MIMO Control of a High-Step-Up Isolated Bidirectional DC–DC Converter," in IEEE Transactions on Industrial Electronics, vol. 69, no. 5, pp. 4687-4696, May 2022, DOI: 10.1109/TIE.2021.3078393.

7. Z. Petric, P. Mattavelli and S. Buso, "Investigation of Nonlinearities Introduced by Multi-sampled Pulsewidth Modulators", IEEE Transactions on Power Electronics, vol. 37, no. 3, pp. 2538 – 2550, Mar. 2022, DOI: 10.1109/TPEL.2021.3110678.
8. Z. Petric, P. Mattavelli and S. Buso, "Feedback Noise Propagation in Multisampled DC–DC Power Electronic Converters," in IEEE Transactions on Power Electronics, vol. 37, no. 1, pp. 150-161, Jan. 2022, DOI: 10.1109/TPEL.2021.3094315.
9. G. Spiazzi, S. Buso, "An Isolated Soft-Switched High-Power-Factor Rectifier Based on the Asymmetrical Half-Bridge Flyback Converter," in IEEE Transactions on Industrial Electronics, DOI: 10.1109/TIE.2021.3100975.
10. Petric, P. Mattavelli, S. Buso, "A Jitter Amplification Phenomenon in Multisampled Digital Control of Power Converters", IEEE Transactions on Power Electronics, 2021, Vol. 36, No. 8, pp. 8685 – 8695, ISSN: 0885-8993; DOI: 10.1109/TPEL.2021.3054576.
11. G. Spiazzi, S. Buso, "Extended Analysis of the Asymmetrical Half-Bridge Flyback Converter", IEEE Transactions on Power Electronics, Vol. 36, No. 7, 2021, pp. 7956-7964; , ISSN: 0885-8993; DOI: 10.1109/TPEL.2020.3044840.
12. J.S. Delgado, P. Mattavelli, S. Cobreces, H. Abedini, M. Rizo, S. Buso, E. Bueno, "Output Capacitance Minimization for Converters in DC Microgrids via Multi-Objective Tuning of Droop-Based Controllers", IEEE Access, Vol. 8, pp. 222700 – 222710, 2020, ISSN: 2169-3536, DOI: 10.1109/ACCESS.2020.3044171.
13. Q. Liu, T. Caldognetto, S. Buso, "Review and Comparison of Grid-Tied Inverter Controllers in Microgrids, IEEE Transactions on Power Electronics, Vol. 35, No. 7, September 2020, pp. 7624 - 7639, ISSN: 0885-8993; DOI: 10.1109/TPEL.2019.2957975.
14. Q. Liu, T. Caldognetto, S. Buso, "Stability Analysis and Auto-Tuning of Interlinking Converters Connected to Weak Grids", IEEE Transactions on Power Electronics, Vol. 34, No. 10, October 2019, pp. 9435 - 9446, ISSN: 0885-8993; DOI: 10.1109/TPEL.2019.2899191.
15. Q. Liu, T. Caldognetto, S. Buso, "Flexible Control of Interlinking Converters for DC Microgrids Coupled to Smart AC Power Systems," IEEE Trans. on Industrial Electronics, DOI: 10.1109/TIE.2018.2856210.
16. S. Buso, T. Caldognetto, Q. Liu, "Analysis and Experimental Characterization of a Large-Bandwidth Triple-Loop Controller for Grid-Tied Inverters", IEEE Trans. on Power Electronics, DOI: 10.1109/TPEL.2018.2835158.
17. T. Caldognetto, S. Buso, P. Tenti, D. Iglesias Brandao, "Power-Based Control of Low-Voltage Microgrids", ", IEEE Journal of Emerging and Selected Topics in Power Electronics (JESTPE), 2015, Vol. 3, No. 4, December 2015, pp. 1056 - 1066, DOI: 10.1109/JESTPE.2015.2413361.
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19. S. Buso, T. Caldognetto, "Rapid Prototyping of Digital Controllers for Microgrid Inverters", IEEE Journal of Emerging and Selected Topics in Power Electronics (JESTPE), 2015, Vol. 3, No. 2, pp. 440 - 450, DOI: 10.1109/JESTPE.2014.2327064.
20. S. Buso, G.Spiazzi, F.Sichirollo, "Study of The Asymmetrical Half Bridge Flyback Converter as an Effective Line Fed Solid State Lamp Driver", IEEE Transactions on Industrial Electronics, Vol. 61, No. 12, December 2014, pp. 6370-6378, Digital Object Identifier: 10.1109/TIE.2014.2314071.
21. T. Caldognetto, S. Buso, P. Mattavelli, "Digital Controller Development Methodology Based on Real-Time Simulations with LabVIEW FPGA© Hardware-Software Toolset", Electronics Journal, Vol. 17, No. 2, December 2013, pp. 110-117, DOI: 10.7251/ELS1317110C.
22. P. Tenti, G. Spiazzi, S. Buso, M. Riva, P. Maranesi, F. Belloni, P. Cova, R. Menozzi, N. Delmonte, M. Bernardoni, F. Iannuzzo, G. Busatto, A. Porzio, F. Velardi, A. Lanza, M. Citterio, C. Meroni, "Power supply distribution system for calorimeters at the LHC beyond the nominal luminosity", 2011 IOP Publishing Ltd and SISSA, DOI:10.1088/1748-0221/6/06/P06005.
23. S. Orlandi, B. Allongue, G. Blanchot, S. Buso, F. Faccio, C. Fuentes Rojas, M. Kayal, S. Michelis, G. Spiazzi, "Optimization of shielded PCB air-core toroids for high efficiency dc-dc converters", IEEE Transactions on Power Electronics, Vol. 26 , No. 7, July 2011, pp. 1837-1846.
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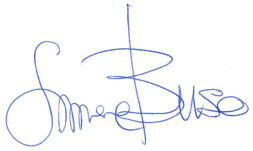

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