

# Guest Editorial

## Special Section on the 2014 IEEE International Symposium on Circuits and Systems (ISCAS 2014)

**W**ELCOME to this Special Section, a collection of selected papers presented at the 2014 IEEE International Symposium on Circuits and Systems (ISCAS 2014), held in Melbourne, Australia, 1–5 June 2014. Over 1000 delegates attended the conference from more than 45 countries; 1224 regular papers were submitted across 17 tracks, and 505 papers were presented at the conference.

Following the conference, authors of several high-quality technical contributions presented at ISCAS in different tracks were invited to submit follow-up papers to the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I: REGULAR PAPERS. The selection was made from a shortlist of contributions that received the highest evaluation during the ISCAS review process as well as those manuscripts that were meritorious of an award during the conference. Among the 30 contributions that were invited, 21 were submitted and, at the end of the review process, 10 were accepted for inclusion in this Special Section. These papers represent a selection of the breadth and scope of interests of the

IEEE Circuits and Systems Society and discuss recent progress in some key areas including *Analog and Mixed-Mode Circuits and Systems*, *Digital Circuits and Systems* and *VLSI, Nonlinear Circuits and Systems*, and *Biomedical Circuits and Systems*.

To conclude we would like to thank all the authors for their contributions and all the reviewers for their fast and thorough work which ensured timely publication of all the manuscripts.

MARIO DI BERNARDO, *Guest Editor*  
University of Naples Federico II, Italy  
University of Bristol, U.K.

GIANLUCA SETTI, *Guest Editor*  
University of Ferrara, Italy

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**Mario di Bernardo** (SM'06–F'12) is currently Full Professor of Automatic Control at the University of Naples Federico II, Italy. He is also Professor of Nonlinear Systems and Control at the University of Bristol, U.K. On 28 February 2007 he was bestowed the title of “Cavaliere” of the Order of Merit of the Italian Republic for scientific merits from the President of Italy. In January 2012 he was elevated to the grade of Fellow of the IEEE for his contributions to the analysis, control and applications of nonlinear systems and complex networks. In 2009, he was elected President of the Italian Society for Chaos and Complexity for the term 2010–2013. He was re-elected in 2010 for the term 2014–2017. In 2006 and again in 2009 he was elected to the Board of Governors of the IEEE Circuits and Systems Society. From 2011 to 2014 he was Vice President for Financial Activities of the IEEE Circuits and Systems Society. In 2014 he was appointed to the Board of Governors of the IEEE Control Systems Society. His research interests include the analysis, synchronization and control of complex networked systems; the analysis and control of hybrid and piecewise-smooth dynamical systems; nonlinear dynamics, nonlinear control theory, and applica-

tions to engineering and synthetic biology. He authored or coauthored more than 220 international scientific publications including more than 110 papers in scientific journals, over 100 contributions to refereed conference proceedings, a unique research monograph on the dynamics and bifurcations of piecewise-smooth systems published by Springer-Verlag, and two edited books. His h-index is 32 and his publications received almost 4000 citations by other authors. He serves on the Editorial Board of several international scientific journals and conferences. From 1st January 2014 he is Deputy Editor-in-Chief of the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I: REGULAR PAPERS. He is also Associate Editor of the IEEE TRANSACTIONS ON CONTROL OF NETWORK NONLINEAR ANALYSIS: HYBRID SYSTEMS, the Conference Editorial Board of the IEEE Control System Society and the European Control Association (EUCA). He was Associate Editor of the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I from 1999 to 2002 and again from 2008 to 2010, and the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART II: EXPRESS BRIEFS papers from 2003 till 2008. He is regularly invited as Plenary Speakers in Italy and abroad. He has been organizer and co-organizer of several scientific initiatives and events including international events at Urbino (2011 and 2013), Paris (2010), Bristol (2009), Napoli (2006), Capri (2006), Bristol (2004), and Milano (2004). He received funding from several institutions including the EU, the Italian Ministry of University and Research, the UK Research Councils, and industry.



**Gianluca Setti** (S'89–M'91–SM'02–F'06) received a Dr. Eng. degree (with honors) in electronic engineering and a Ph.D. degree in electronic engineering and computer science from the University of Bologna, Bologna, Italy, in 1992 and in 1997, respectively, for his contribution to the study of neural networks and chaotic systems.

From May 1994 to July 1995 he was with the Laboratory of Nonlinear Systems (LANOS) of the Swiss Federal Institute of Technology, Lausanne, (EPFL) as Visiting Researcher. Since 1997 he has been with the School of Engineering at the University of Ferrara, Italy, where he is currently a Professor of Circuit Theory and Analog Electronics. He held several positions as Visiting Professor/Scientist at EPFL (2002, 2005), UCSD (2004), IBM T. J. Watson Laboratories (2004, 2007), and at the University of Washington in Seattle (2008, 2010) and is also a permanent faculty member of ARCES, University of Bologna. His research interests include nonlinear circuits, recurrent neural networks, implementation and application of chaotic circuits and systems, statistical signal processing, electromagnetic compatibility, and compressive sensing.

Dr. Setti received the 1998 Caianiello prize for the best Italian Ph.D. thesis on Neural Networks. He is also recipient of the 2013 IEEE CAS Society Meritorious Service Award and corecipient of the 2004 IEEE CAS Society Darlington Award, of the 2013 IEEE CAS Society Guillemin-Cauer Award, as well as of the best paper award at ECCTD2005, and the best student paper award at EMCZurich2005 and at ISCAS2011. He served as an Associate Editor for the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I (1999–2002 and 2002–2004) and for the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART II (2004–2007), the Deputy-Editor-in-Chief, for the IEEE *Circuits and Systems Magazine* (2004–2007) and as the Editor-in-Chief for the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART II (2006–2007) and of the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I (2008–2009). He also served in the editorial Board of IEEE Access (2013–2014). He was the 2004 Chair of the Technical Committee on Nonlinear Circuits and Systems of the IEEE CAS Society, a Distinguished Lecturer (2004–2005) of the same Society, as well as a member of its Board of Governors (2005–2008), and served as the 2010 CAS Society President. In 2012, he was the Chair of the IEEE Strategic Planning Committee of the Publication Services and Products Board (PSPB-SPC) and in 2013–2014 he was the first non North-American Vice President of the IEEE for Publication Services and Products. Dr. Setti was the Track Chair for Nonlinear Circuits and Systems of ISCAS2004 (Vancouver), the Special Sessions Co-Chair of ISCAS2005 (Kobe) and ISCAS2006 (Kos), the Technical Program Co-Chair of NDES2000 (Catania), ISCAS2007 (New Orleans), ISCAS2008 (Seattle), ICECS2012 (Seville), BioCAS2013 (Rotterdam) as well as the General Co-Chair of NOLTA2006 (Bologna). He is coeditor of the book *Chaotic Electronics in Telecommunications* (CRC Press, 2000), *Circuits and Systems for Future Generation of Wireless Communications* (Springer, 2009), and *Design and Analysis of Biomolecular Circuits* (Springer, 2011), as well as one of the guest editors of the May 2002 Special Issue of the PROCEEDINGS OF THE IEEE on “Applications of Non-linear Dynamics to Electronic and Information Engineering.”



**Wouter A. Serdijn** (M'98–SM'08–F'11) was born in Zoetermeer (“Sweet Lake City”), The Netherlands, in 1966. He received the M.Sc. (*cum laude*) and Ph.D. degrees from Delft University of Technology, Delft, The Netherlands, in 1989 and 1994, respectively.

His research interests include low-voltage, ultra-low-power and ultra wideband integrated circuits and systems for biosignal conditioning and detection, neuroprosthetics, transcutaneous wireless communication, power management and energy harvesting as applied in, e.g., hearing instruments, cardiac pacemakers, cochlear implants, neurostimulators, portable, wearable, implantable and injectable medical devices and electroceuticals. He is coeditor and coauthor of the books *EMI-Resilient Amplifier Circuits* (Springer 2013), *Ultra Low-Power Biomedical Signal Processing: An Analog Wavelet Filter Approach for Pacemakers* (Springer, 2009), *Circuits and Systems for Future Generations of Wireless Communications* (Springer, 2009), *Power Aware Architecting for Data Dominated Applications* (Springer, 2007), *Adaptive Low-Power Circuits for Wireless Communications* (Springer, 2006), *Research Perspectives on Dynamic Translinear and Log-Domain Circuits*

(Kluwer, 2000), *Dynamic Translinear and Log-Domain Circuits* (Kluwer, 1998), and *Low-Voltage Low-Power Analog Integrated Circuits* (Kluwer, 1995). He authored and coauthored 8 book chapters and more than 250 scientific publications and presentations. He teaches circuit theory, analog signal processing, micropower analog IC design, and bioelectronics. He received the Electrical Engineering Best Teacher Award in 2001 and 2004. He has served, among others, as IEEE Distinguished Lecturer (2013–2014), as General Chair for IEEE BioCAS 2013, Technical Program Chair for IEEE BioCAS 2010 and as Technical Program Chair for IEEE ISCAS 2010, 2012 and 2014, as a member of the Board of Governors (BoG) of the IEEE Circuits and Systems Society (2006–2011), as chair of the Analog Signal Processing Technical Committee of the IEEE Circuits and Systems society, as a member of the Steering Committee of the IEEE TRANSACTIONS ON BIOMEDICAL CIRCUITS AND SYSTEMS (T-BIOCAS) and as Editor-in-Chief for IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I: REGULAR PAPERS (2010–2011). He currently is General Co-Chair for IEEE ISCAS 2015.

Dr. Serdijn is a Mentor of the IEEE.



**Yong Lian** (M'90-SM'99-F'09) received the B.Sc. degree from the College of Economics and Management, Shanghai Jiao Tong University, Shanghai, China, in 1984, and the Ph.D. degree from the Department of Electrical Engineering in National University of Singapore (NUS), Singapore, in 1994. He spent nine years in industry and joined NUS in 1996. He was appointed as the first Provost's Chair Professor in the Department of Electrical and Computer Engineering of NUS in 2011. He is the Founder of ClearBridge VitalSigns Pte. Ltd., a start-up for wireless wearable biomedical devices.

Dr. Lian's research interests include biomedical circuits and systems and signal processing. He has received many awards including IEEE Circuits and Systems Society's Guillemain-Cauer Award (1996), IEEE Communications Society Multimedia Communications Best Paper Award (2008), Institution of Engineers Singapore Prestigious Engineering Achievement Award (2011), Hua Yuan Association/Tan Kah Kee International Society Outstanding Contribution Award (2013), and Chen-Ning Franklin Yang Award in Science and Technology for New Immigrant (2014). As an educator, Dr. Lian received the University Annual Teaching Excellent Award in two consecutive academic years from 2008 to 2010 and many other teaching awards from the Faculty of Engineering. Under his guidance, his students received many awards including the Best Student Paper Award in ICME 2007, winner of 47th DAC/ISSCC Student Design Contest in 2010, Best Design Award in A-SSCC 2013 Student Design Contest.

Dr. Lian is the Vice President for Publications of the IEEE Circuits and Systems (CAS) Society, Steering Committee Member of the IEEE TRANSACTIONS ON BIOMEDICAL CIRCUITS AND SYSTEMS, and the IEEE TRANSACTIONS ON MULTIMEDIA. He was the Editor-in-Chief of the IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART II: EXPRESS BRIEFS for two terms from 2010 to 2013. He was the Guest Editor for eight Special Issues in IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—PART I: REGULAR PAPERS, IEEE TRANSACTIONS ON BIOMEDICAL CIRCUITS AND SYSTEMS, and *Journal of Circuits, Systems Signal Processing*. He was the Vice President for the Asia Pacific Region of the IEEE CAS Society from 2007 to 2008, AdComm Member of the IEEE Biometrics Council from 2008 to 2009, CAS Society Representative to the BioTechnology Council from 2007 to 2009, Chair of the BioCAS Technical Committee of the IEEE CAS Society from 2007 to 2009, Chair of DSP Technical Committee of the IEEE CAS Society from 2010 to 2011, Member of the IEEE Medal for Innovations in Healthcare Technology Committee from 2010 to 2012, and a Distinguished Lecturer of the IEEE CAS Society from 2004 to 2005. He is the Founder of the International Conference on Green Circuits and Systems, the Asia Pacific Conference on Postgraduate Research in Microelectronics and Electronics, and the IEEE Biomedical Circuits and Systems Conference. He is a Fellow of the Academy of Engineering Singapore.