

IEEE Technical Committee on Nonlinear Circuits and Systems  
Annual Report to the IEEE Circuits and Systems Society 2014

During the period 2013-2014 between the ISCAS at Beijing, China and the ISCAS at Melbourne, Australia, the members of the Nonlinear Circuits and Systems Technical Committee (TC-NCAS) co-edited 5 books, wrote 4 book chapters, (co-)edited 5 special issues, organized/took part in the organization of 33 conferences and workshops, organized 19 special sessions, and delivered 43 invited lectures in major conferences and workshops related to Circuits and Systems.

**1. Books written/edited**

- [1]. Bharathwaj Muthuswamy, A Route to Chaos Using Integrated Circuits - The Field-Programmable Gate Array Approach. Co-authored with Dr. Banerjee. To be published by Springer-Verlag in 2014.
- [2]. Henry Leung, Chaotic Signal Processing, Society for Industrial and Applied Mathematics, December 2013.
- [3]. C. Gracio, D. Fournier-Prunaret, T. Ueta and Y. Nishio (Ed.), Nonlinear Maps and their Applications, Springer, 2014.
- [4]. G. R. Chen, X. F. Wang and X. Li, Fundamentals of Complex Networks: Models, Structures and Dynamics (2nd ed.), 438pp, Wiley, New York – Singapore - Beijing, 2014.
- [5]. Simin Yu, Jinhua Lu and Guanrong Chen, Chaotification of Dynamical Systems and Its Applications, Beijing: Science Press, 2013.

**2. Book chapters written**

- [1]. L. P. Wang, F. Chu, W. Xie, "Fuzzy Logic and Rule-Based Methods in Bioinformatics", Springer Handbook of Bio-/Neuroinformatics, pp. 235-249, 2014.
- [2]. L. P. Wang and Shekhar Gupta, "Neural networks and wavelet de-noising for stock trading and prediction", Time Series Analysis, Modeling and Applications, Witold Pedrycz and Shyi Ming Chen (Eds.), Springer, pp. 229-247, 2013.
- [3]. Bharathwaj Muthuswamy, "An Introduction to the Field-Programmable Gate Array Using Chaotic Systems". Springer-Verlag Series on Complexity, Vol. 4.
- [4]. X. Hu, G. R. Chen, S. Duan and G. Feng, "A memristor-based chaotic system with boundary conditions," Book Chapter in A. Adamatzky and L. Chua (eds.), Memristor Networks, Springer, April 2014, pp. 351-364.

### **3. Special issues edited**

- [1]. Shujun Li and Edgar Weippl, Information Security Technical Report (renamed to Journal of Information Security and Applications in May 2013), Special Issue: ARES 2012 7th International Conference on Availability, Reliability and Security, scheduled for publication in May 2013
- [2]. H. Asai (Guest Editor), Special Section on Analog Circuit Techniques and Related Topics, IEICE Trans. on Fundamentals, issued in March, 2014.
- [3]. Mario di Bernardo (Guest Editor) the special issue of Physica D on “Evolving Dynamical Networks”, 2013.
- [4]. Hiroo Sekiya (Secretary), Special Section on Analog Circuit Techniques and Related Topics, IEICE Trans. on Fundamentals, issued in March, 2014.
- [5]. Hiroo Sekiya (Secretary), Francis Lau (Guest Associate Editor), Jinhu Lu (Guest Associate Editor), Sergio Callegari (Guest Associate Editor), Ljiljana Trajkovic (Associate Editor), and Michael Tse (Associate Editor), Special Section on Communication Sciences and Engineering, IEICE NOLTA Journal, Apr. 2014.

### **4. Conferences, workshops organized**

- [1]. Shujun Li (Publicity Co-Chair), 2013 UK Workshop on Computational Intelligence (UKCI2013), University of Surrey, Guildford, United Kingdom September 9-11, 2013.
- [2]. Shujun Li (Local Arrangement Co-Chair), 23rd IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2013), Southampton, United Kingdom, September 22-25, 2013.
- [3]. Mustak E. Yalcin (Publicity Chairs), 14th International Workshop on Cellular Nanoscale Networks and their Application, Notre Dame, USA, July 2014,.
- [4]. H. Asai (General Chair), the IEEE Electrical Design of Advanced Packaging & Systems Symposium (EDAPS2013), Nara, Japan, December, 2013.
- [5]. L. P. Wang (Organizing Committee Co-Chair), 2014 10th International Conference on Natural Computation (ICNC 2014), Xiamen, China (Technical Co-Sponsor: IEEE CASS) , 19-21 August 2014.
- [6]. L. P. Wang (Organizing Committee Co-Chair), 2014 11th International Conference on Fuzzy Systems and Knowledge Discovery (FSKD 2014), Xiamen, China (Technical Co-Sponsor: IEEE CASS), 19-21 August 2014.
- [7]. L. P. Wang (Advisory Committee Chair), 2013 9th International Conference on Natural Computation (ICNC 2013), Shenyang, China (Technical Co-Sponsor: IEEE CASS), 23-25 July 2013.

- [8]. L. P. Wang (Advisory Committee Chair), 2013 10th International Conference on Fuzzy Systems and Knowledge Discovery (FSKD 2013), Shenyang, China (Technical Co-Sponsor: IEEE CASS), 23-25 July 2013.
- [9]. Abdelali El Aroudi (General Chair), the 21st edition of Seminar on Automation, Instrumentation and Automatic Control (SAAEI2014), Tangier, Morocco, June 25-27, 2014.
- [10]. Abdelali El Aroudi (Track Chair), 2014 Latin American Symposium on Circuits and Systems (LASCAS2014), February 25 - 28, 2014.
- [11]. Bharathwak Muthswamy, An Introduction to Field-Programmable Gate Arrays, Vellore Institute of Technology, Vellore, India, August 2013.
- [12]. Bharathwak Muthswamy, Timing Closure FPGA Workshop, Vellore Institute of Technology, Vellore, India, August 2013.
- [13]. Bharathwak Muthswamy, Nonlinear Dynamics and Chaos Workshop, Vellore Institute of Technology, Vellore, India, August 2013.
- [14]. Ljiljana Trajkovic, 2013 IEEE International Workshop on Complex Systems and Networks, (IWCSN 2013), Vancouver, British Columbia, Canada, December 11-13, 2013.
- [15]. Chai Wah Wu, IMA Hot Topics Workshop: Mathematical and Computational Challenges in the Control, Optimization, and Design of Energy-Efficient Buildings, June 11-14, 2013.
- [16]. Elena Blokhina, Co-chair (with Yoko Uwate) for GoLD/YP (Graduates of the Last Decade/Young Professionals), International Symposium on Circuits and Systems (ISCAS2014), Melbourne, Australia, June 1-5, 2014.
- [17]. Elena Blokhina, Track co-chair (with S. Callegari) for Nonlinear Circuits and Systems, Neural Systems, IEEE International Conference on Electronics, Circuits and Systems (ICECS2013), Abu Dhabi, UAE, December 8-11, 2013.
- [18]. Alessandro Colombo, Chair for Analysis and Applications of Nonsmooth Systems, CASS outreach sponsorship, Como, Italy, September 2014.
- [19]. Alessandro Colombo, Co-Organizer for Bifurcations in Piecewise-smooth systems: Perspectives, Methodologies and Open Problems, University of Urbino, Italy, September 11-13, 2013.
- [20]. Y. Nishio (General Co-Chair) and Y. Uwate (Secretary), IEEE CASS Shanghai and Shikoku Chapters Joint Workshop on Circuits and Systems (SSJW'13), Shanghai, China, November 24, 2013.
- [21]. Hiroo Sekiya (Technical Program Chair), International Workshop on Nonlinear Circuits, Communications, and Signal Processing (NCSP2014), Honolulu, Hawaii, Mar. 1-3, 2014.
- [22]. Hiroo Sekiya (Technical Program Chair), 2nd Korea-Japan Joint Workshop on Complex Communication Sciences (KJCCS2013), Oct. 17-19, 2013

- [23]. Wei Xing Zheng, Track Chair of Neural Networks and Systems of the 46th IEEE International Symposium on Circuits and Systems (ISCAS'2013), Beijing, China, May 2013.
- [24]. Wei Xing Zheng served as an Organizing Committee Member of the 47th IEEE International Symposium on Circuits and Systems (ISCAS'2014), Melbourne, Australia, June 2014.
- [25]. G. R. Chen, The 7th International Workshop on Chaos-Fractals Theories and Applications, 12-14 September 2014, Qingdao, China
- [26]. G. R. Chen, 2013 International Workshop on Complex Systems and Networks, 11-13 December 2013, Vancouver, Canada
- [27]. G. R. Chen, The 9th Chinese Conference on Complex Networks, 13-15 September 2013, Hangzhou, China
- [28]. G. R. Chen, The 6th International Scientific Conference on Physics and Control (PhyCon'13), 26-29 August 2013, San Luis Potosí, México
- [29]. G. R. Chen, The 6th International Workshop on Chaos-Fractals Theories and Applications, 8-11 August 2013, Taiyuan, China
- [30]. G. R. Chen, Publicity Chair, The 9th Asian Control Conference, Istanbul, Turkey, 23-26 June 2013.
- [31]. Jinhu Lu, Publication Chair of ISCAS 2014, Melbourne, Australia
- [32]. Jinhu Lu, Program Co-Chair of the 9th Asian Control Conference (ASCC 2013), Istanbul, Turkey
- [33]. Jinhu Lu, Co-Chair of 2014 International Workshop on Complex Networks and Applications, 30 May, 2014, Melbourne, Australia

## **5. Special sessions organized**

- [1]. H. Asai, Special Sessions on Signal Integrity on 3D IC and Package, URSI APRASC 2013 (Asia-Pacific Radio Science Conference 2013), Taipei, Taiwan, September, 2013.
- [2]. H. Asai, Special Sessions on Numerical Modeling for SI/PI/EMC, URSI APRASC 2013 (Asia-Pacific Radio Science Conference 2013), Taipei, Taiwan, September, 2013.
- [3]. Abdelali El Aroudi, Nonlinear Dynamics of Power Converters, IECON 2013, Vienna
- [4]. Abdelali El Aroudi, Nonlinear dynamics, Bifurcations and Analysis of Chaos in Electrical and Electromechanical systems, International Conference on Nonlinear Structural Dynamics, 2014,
- [5]. Abdelali El Aroudi, Special Session on Nonlinearities in Energy Harvesting Systems: Analysis and Applications, IEEE ISCAS 2014, Melbourne, Australia.
- [6]. Abdelali El Aroudi, Nonlinear Dynamics of Interconnected Power Converters, NOLTA 2014, Luzern, Switzerland.
- [7]. Abdelali El Aroudi, Special Session on Technologies for Renewable energy, SSD2014, Castelldefels, Spain.

- [8]. Mustak E. Yalcin and Mattia Frasca, Spatio-temporal Dynamics in Memristor Circuits, 8th INTERNATIONAL CONFERENCE on ELECTRICAL and ELECTRONICS ENGINEERING, Nov. 28-30 2013, Bursa, Turkey
- [9]. Mario di Bernardo, Contraction Theory and applications at the IEEE Conference on Decision and Control, Firenze (Italy), December 2014
- [10]. Mario di Bernardo, the International Tutorial Workshop on Bifurcations of Piecewise Smooth Systems of the Italian Society for Chaos and Complexity, Urbino, September 2013
- [11]. Ljiljana Trajkovic, R. Chen, and J. Lu, Special Session on Advances in Complex Networks: Theories and Applications, International Symposium on Circuits and Systems( ISCAS 2013), Beijing, China, May 19-23, 2013.
- [12]. Sergio Callegari, Pietro Burrascano, Giuseppe Acciani, Augusto Montisci, Marco Raugi, and Mario Versaci, Special Sessions on Industrial NDT Ultrasonic Imaging, International symposium on Digital Signal Processing (DSP2013), Santorini, Greece, July 1-3, 2013.
- [13]. Elena Blokhina and D. Galaykoa, Special Sessions on Complexity of Heterogeneous Systems on Chip, International Symposium on Circuits and Systems (ISCAS2014), Melbourne, Australia, June 1-5, 2014.
- [14]. Elena Blokhina and A. El Aroudi, Special Sessions on Nonlinearity In Energy Harvesting Systems: Analysis and Applications, International Symposium on Circuits and Systems (ISCAS2014), Melbourne, Australia, June 1-5, 2014.
- [15]. Alessandro Colombo, Invited session on Nonsmooth Dynamical Systems: Uncertainties, Singularities and Bifurcations, SIAM Conference on Applications of Dynamical Systems (SIAM DS13), Snowbird, USA, May 2013.
- [16]. Y. Uwate and Y. Nishio (Organizers), Special Session on Coupled Nonlinear Circuits and Networks, International Symposium on Nonlinear Theory and its Applications (NOLTA'13), Santa Fe, U.S.A., September 8-11, 2013.
- [17]. Wei Xing Zheng, Special Sessions Co-Chair of the 47th IEEE International Symposium on Circuits and Systems (ISCAS'2014), Melbourne, Australia, June 2014.
- [18]. Hiroo Sekiya (Organizer), Special Session on Complex Communication Sciences, International Workshop on Nonlinear Circuits, Communications, and Signal Processing (NCSP2014), Honolulu, Hawaii, Mar. 1-3, 2014.
- [19]. G. R. Chen, Co-Organizer and Co-Chair, Special Session on Analysis, Synchronization and Control of Complex Networks: Theory and Applications, IEEE Int. Symp. Circ. Syst. (ISCAS), Melbourne, Australia, 1-4 June 2014.

## 6. Invited lectures delivered

- [1]. Shujun Li, When Security Meets Usability: e-Banking as an Example, Invited Talk at Escuela Politécnica Superior, Universidad Autónoma de Madrid (UAM, Autonomous University of Madrid), Spain, Apr. 2014
- [2]. Shujun Li, From Digital Watermarking to Multimedia Forensics: How can they help to detect lost identities in multimedia work? Invited Talk at the Workshop on Identity Lost – electronic identity, digital orphan works and copyright law reform, St Cecilia's Hall, Edinburgh University, UK, Sep. 2013
- [3]. Shujun Li, Usable Security: When Security Meets Usability, Invited Talk at the College of Information Engineering, Xiangtan University, Hunan, China, Sep. 2013
- [4]. Mustak E. Yalcin, Active wave computing using the doppler effect and reconfigurable processor population, IRUN Winter School on nonlinear dynamics in cellular wave computing, January 2013, Budapest, Hungary
- [5]. Bharathwak Muthswamy, Chaotic Dynamics of the Muthuswamy-Chua System, August 2013
- [6]. Lipo Wang, Laplacian Regularized Subspace Learning for Interactive Image Re-ranking and Biased Subspace Learning for SVM Relevance Feedback in Content-Based Image Retrieval, the First International Conference on Emerging Trends, Technology and Research (ICETTR 2013), September 2013, Maharashtra, India
- [7]. Lipo Wang, Content-Based Image Retrieval with Statistical Machine Learning, 2013 International Symposium on Computational and Business Intelligence (ISCBI 2013), New Delhi, India, August 2013
- [8]. Ljiljana Trajkovic, “Excellence and Innovation in Teaching”, IEEE Systems, Man, and Cybernetics Society Celebration Lecture Series 2014: The Making of an Academic, The University of Sydney, Australia, April 2014
- [9]. Ljiljana Trajkovic, “Excellence and Innovation in Teaching”, IEEE Systems, Man, and Cybernetics Society Celebration Lecture Series 2014: The Making of an Academic, Fu Jen Catholic University, New Taipei City, Taiwan, April 2014.
- [10]. Ljiljana Trajkovic, “Deflection routing in complex networks”, 2013 IEEE International Workshop on Complex Systems and Networks (IWCSN2013), Vancouver, British Columbia, Dec. 2013.
- [11]. Ljiljana Trajkovic, “Teaching excellence”, IEEE SMC Celebration Lecture Series 2013, China, Tianjin University, Tianjin, China, July 2013.
- [12]. Ljiljana Trajkovic, “Teaching excellence”, IEEE SMC Celebration Lecture Series 2013, Hebei University, Baoding, China, July 2013.
- [13]. Ljiljana Trajkovic, “Exploration of the theory of DC operating point for analog circuit design”, IEEE CASEO TC Workshop "Re-Thinking CAS Education: Exploring New Pedagogies and

- Approaches", Beijing, China, May 2013.
- [14].Ljiljana Trajkovic, "Machine learning models for feature selection and classification of traffic anomalies", National Taiwan University of Science and Technology, Taipei, Taiwan, May 2013.
- [15].Ljiljana Trajkovic, "Intelligent Internet systems", National Taiwan University of Science and Technology, Taipei, Taiwan, May 2013.
- [16].Ljiljana Trajkovic, "Machine learning models for feature selection and classification of traffic anomalies", National Cheng Kung University, Tainan, Taiwan, May 2013.
- [17].Ljiljana Trajkovic, "Machine learning models for feature selection and classification of traffic anomalies", National Center for High-Performance Computing, Taichung, Taiwan, May 2013.
- [18].Ljiljana Trajkovic, "Understanding communication networks" (keynote talk), Consumer Electronics Forum, New Taipei City, Taiwan, May 2013.
- [19].Sergio Callegari, "Convex optimization in the design of the noise shaping features of Delta-Sigma Modulators", IEEE CASS sponsored Lecture cycle "Developing Inter-disciplinary Education in Circuits and Systems Community", Polytechnic of Milan, Milan, Italy, March 6, 2014.
- [20].Elena Blokhina, "Sigma-Delta Inspired MEMS" (Invited speaker/lecture), International Workshop on Nonlinear Maps and Their Applications (NOMA2013), Zaragoza, Spain, September 3-4, 2013.
- [21].Xiang Li, "Probing into human interactive dynamics with temporal complex networks" (Invited), International Workshop of Complex Systems and Networks (IWCSN2013), Vancouver, Canada, December 2013.
- [22].Xiang Li, "Structural controllability of temporal networks and beyond", (Keynote), Chinese Forum of Network Science, Beijing, China, April 2014.
- [23].Alessandro Colombo, "Safety verification of multi-vehicle systems by scheduling", MIT, Cambridge, USA, July 2013
- [24].Alessandro Colombo, "Safety verification of multi-vehicle systems by scheduling", Chalmers University, Sweden, January 2014.
- [25].Jinhu Lü, 1) Complex Networks: Examples, Basic Concepts, Modeling; 2) Network Sciences: Opportunities and challenges, 2013 Summer School on Complex Systems of NSF and Department of Education of China, July 9-20, 2013, Beijing, China. (Plenary Talk)
- [26].Jinhu Lü, Network Sciences: Opportunities and challenges, 2013 National Doctoral Forum on Control Science and Engineering, July 19-21, 2013, Qingdao, China. (Plenary Talk)
- [27].Jinhu Lü, Big Data: Opportunities and challenges for Network Sciences, Scientific Data Processing and Analysis Workshop, October 21-22, 2013, Hefei, China. (Plenary Talk)
- [28].Jinhu Lü, Big Data: Opportunities and challenges for Network Sciences, Network Control and Network Fault Diagnosis Workshop, November 22-23, 2013, Nanjing, China. (Plenary Talk)

- [29].Jinhu Lü, Big Data: Opportunities and challenges for Network Sciences, the 8th Workshop on Complex Systems and Network Sciences, November 23, 2013, Nanjing, China. (Plenary Talk)
- [30].Jinhu Lü, Complex Networks: Nexus of all realities in circuits and systems, Distinguished Lecture for PTRI of RMIT University, Australia, November 4-9, 2013, Melbourne, Australia. (Plenary Talk)
- [31].Jinhu Lü, When structure meets function in evolutionary dynamics on complex networks, The 10th International Workshop on Complex Systems and Networks, December 11-13, 2013, Vancouver, Canada. (Plenary Talk)
- [32].Jinhu Lü, G. Chen, M. J. Ogorzalek, and L. Trajkovic, Theory and applications of complex networks: Advances and challenges, 2013 IEEE International Symposium on Circuits and Systems (ISCAS), May 19-23, 2013, Beijing, China.
- [33].P. Wang, Jinhu Lü, L. Wan, and Y. Chen, A stochastic simulation algorithm for biochemical reactions with delays, the 7th International Conference on Systems Biology (ISB), August 23–25, 2013, Huangshan, China.
- [34].F. Li, Y. Chen, Jinhu Lü, and D. Hill, Cluster consensus of Boolean multi-agent systems, the 9th Asian Control Conference (ASCC), June 23-26, 2013, Istanbul, Turkey.
- [35].C. Shen, S. Yu, Jinhu Lü, and G. Chen, Generating hyperchaotic systems with multiple positive Lyapunov exponents, the 9th Asian Control Conference (ASCC), June 23-26, 2013, Istanbul, Turkey.
- [36].W. Xiong, W. Yu, Jinhu Lü, and X. Yu, Fuzzy sampled controller design for consensus of multiagent networks with varying connections, the 9th Asian Control Conference (ASCC), June 23-26, 2013, Istanbul, Turkey.
- [37].W. Yu, Jinhu Lü, X. Yu, and G. Chen, A step forward to pinning control of complex networks: Finding an optimal vertex to control, the 9th Asian Control Conference (ASCC), June 23-26, 2013, Istanbul, Turkey.
- [38].S. Tan, Jinhu Lü, X. Yu, and D. Hill, Inheritance of spatial neighborhood: A feasible mechanism for evolution and maintenance of cooperation, the 32nd Chinese Control Conference (CCC), July 26-28, 2013, Xi'an, China.
- [39].W. Sun, Jinhu Lü, S. Chen, and X. Yu, Consensus of multi-agent systems with unbalanced topology, the 32nd Chinese Control Conference (CCC), July 26-28, 2013, Xi'an, China.
- [40].H. Zhu, Jinhu Lü, and J. Lu, Synchronization of a class of small-world networks via drivingly coupled scheme, the 32nd Chinese Control Conference (CCC), July 26-28, 2013, Xi'an, China.
- [41].Y. Chen, H. Dong, Jinhu Lü, and X. Sun, Non-smooth Lyapunov function for nonlinear consensus problem, the 2013 American Control Conference (ACC), June 17-19, 2013, Washington, USA.
- [42]. G. R. Chen, 2013 Leverhulme Lectures on Chaos Theory and on Complex Networks,



University of Bristol, UK

[43].G. R. Chen, 2013 IAS Benjamin Meaker Lecture on Networks Control and Synchronization,  
University of Bristol, UK

TC-NCAS Officers, term ending at ISCAS 2014

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Past Chair: Francis Lau, enclmlau at polyu.edu.hk

Chair Elect: Jinhua Lu, jinhua.lu at rmit.edu.au

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Prepared by Hiroo Sekiya, May 2014