IEEE Technical Committee on Nonlinear Circuits and Systems

Annual Report to the IEEE Circuits and Systems Society

May 2012

Contributions

Members of the Technical Committee have reported the following contributions for the period May 2011-May 2012:

Books written/edited

G. Chen, X. Wang, X. Li, *Introduction to Complex Networks: Models, Structures and Dynamics*, Higher Education Press, Beijing, May 2012.

K. Hosseini and M.P. Kennedy. *Minimizing Spurious Tones in Digital Delta-Sigma Modulators*, Springer, 2011.

H. Koeppl, D. Densmore, G. Setti, M. di Bernardo, *Design and Analysis of Bio-molecular Circuits,* Springer-Verlag, 2011

K. Okumura, *Electric Circuit Theory*, Asakura Publishing Co., 2011 (in Japanese).

X. Wang, X. Li, G. Chen, *Network Science: An Introduction*, Higher Education Press, Beijing, April 2012 (in Chinese)

Book chapters written

G. Alvarez, J. M. Amigó, D. Arroyo and S. Li, "Lessons Learnt from the Cryptanalysis of Chaos-Based Ciphers," in *Chaos-Based Cryptography: Theory, Algorithms and Applications, Studies in Computational Intelligence*, L. Kocarev and S. Lian (eds.), Springer-Verlag, 2011

F. Corinto, A. Ascoli, and M. Gilli, "Memristor Models for Pattern Recognition Systems", in *Advances in Neuromorphic Memristor Science and Applications,* R. Kozma et al. (eds.), Springer Series in Cognitive and Neural Systems, Springer Science+Business Media Dordrecht, 2012

P. De Lellis, M. di Bernardo, G. Russo, "Adaptation and contraction theory for the synchronization of complex neural networks" in *The Relevance of the Time Domain to Neural Network Models*, A. R. Rao and G. A. Cecchi (eds.), Springer-Verlag , 9-33 , 2012

S. Li, "On the Performance of Secret Entropy Coding: A Perspective Beyond Security, " in *Autonomous Systems: Developments and Trends, Studies in Computational Intelligence*, vol. 391, Springer, 2011

W.-K. Ling, "Pattern recognition via perceptron, " in *Computational Intelligence and Its Applications: Evolutionary Computation, Fuzzy Logic, Neural Network and Support Vector Machine Techniques*, H. K. Lam, S. S. H. Ling and H. T. Nguyen (eds.), Imperial College Press, 2012

W.-K. Ling, "HIV Therapy via Engineering Approach, " in *Applications of Nonlinear Dynamics and Chaos in Engineering - Vol. 2,* S. Banerjee, L. Rondoni and M. Mitra (eds.), Springer-Verlag, 2012

W.K.S. Tang and Y. Liu, "Formation of high-dimensional chaotic maps and their uses in cryptography", in *Chaos-Based Cryptography: Theory, Algorithms and Applications, Studies in Computational Intelligence*, L. Kocarev and S. Lian (eds), Springer-Verlag, 2011

Special issues edited

M. di Bernardo with I Belykh, M Porfiri and J. Kuerths, Special Issue on Evolving Dynamical Networks, *Physica D*

H. Sekiya, Special Section on Papers Awarded the Student Paper Award at NCSP'11, *Journal of Signal Processing*, vol. 15, no. 4, July 2011

H. Sekiya, Special Section on Nonlinear Circuits, Communications, and Signal Processing, *Journal of Signal Processing*, vol. 15, no. 6, Nov. 2011

H. Sekiya, Special Section on Synchronization in Nonlinear Science and Engineering, *IEICE NOLTA*, vol. 3, no. 2, Apr. 2012

Conferences, workshops organized

S. Callegari, Short Course on Oscillation Based Test, Chaotic Dynamics, and Complex Oscillation Based Test, University of Washington, WA, USA, June 2011

G. Chen (Publicity Co-Chair), IEEE Int. Conference on Automation and Logistics, Chongqing, China, August 2011

G. Chen (Co-Chairman and Co-Organizer), The 4th International Workshop on Chaos-Fractals Theories and Applications, October 2011, Hangzhou, China (technically sponsored by TC-NCAS)

G. Chen, J. Lu and L. Trajkovic, International Workshop on Complex Systems and Networks, Melbourne, Australia, Sept. 2011

F. Corinto (Organizer), Workshop supported by IEEE CAS,"Memristor: From Theory to Applications", Politecnico di Torino, Italy, December 2011

J. Lu (Program Co-Chair), 7th Chinese Conference on Complex Networks, Chengdu, China, October 2011

J. Lu (Co-Organizer), 8th Chinese Workshop on Networks Science, Beijing, China, April 2012

J. Lu (International Publicity Co-Chair, 37th Annual Conference of the IEEE Industrial Electronics Society, Melbourne, Australia, November 2011

Y. Nishio (General Chair) and Y. Uwate (Secretary), IEEE CASS Shanghai and Shikoku Chapters Joint Workshop on Nonlinear Circuits and Systems (SSJW'11), Shanghai, China, November 2011

Y. Nishio (General Chair), T. Ueta (Technical Program Chair) and Y.Uwate (Technical Program Secretary), RISP International Workshop on Nonlinear Circuits, Communications and Signal Processing (NCSP'12), Hawaii, U.S.A, March 2012

C.K. Tse, International Workshop on Chaos-Fractals Theories and Applications, Hangzhou, China, October 2011

C.K. Tse, International Workshop on Complex Networks and Systems, Melbourne, Australia, September 2012

T. Ueta and C.K. Tse (Technical Program Co-Chairs), Y. Nishio and W.K. S. Tang (Special Session Co-Chairs) and T. Hisakado (General Secretary), International Symposium on Nonlinear Theory and its Applications (NOLTA'11), Kobe, Japan, September 2011

T. Ueta and Y. Nishio (Workshop Co-Organizers), International Workshop on Nonlinear Maps and their Applications (NOMA'11), Évora, Portugal, September 2011

Members also served on the Technical Program Committees and Review Committees of a number of conferences.

Special sessions organized

H. Asai, Special Session on Advanced Modeling, Simulation and Design of SI/PI/EMI, Asia-Pacific Electromagnetic Compatibility, Singapore, May 2011

S. Banerjee, Special Session on Nonsmooth Dynamics of Electrical Systems, ISCAS, Rio, Brazil, May 2011

G. Chen, Special Session on Complex Networks and Multi-agent Systems, 37th Annual Conference of IEEE Industrial Electronics Society (IECON 2011), Melbourne, Australia, November 2011

M. di Bernardo, Two Minisymposia on Evolving Dynamical Networks co-organized with I Belykh, M Porfiri and J. Kuerths, SIAM Conference on Applied Dynamical Systems, Snowbird, Utah, USA, May 2011

C. Göknar, Special Sessions on Circuit and Systems Education - History and Future Prospects-1 and 2, 7th International Conference on Electrical and Electronics Engineering, Bursa, Turkey, December 2011

X. Li, Invited Session on Collective Behavior Analysis and Control via Predictive Mechanisms, Chinese Control Conference, Yantai, China, July 2011

Y. Nishio, Special Session on Image Processing and Pattern Recognition, RISP International Workshop on Nonlinear Circuits, Communications and Signal Processing (NCSP'12), Honolulu, Hawaii, March 2012

H. Sekiya, Special Session on Analysis and Design for Power Electronic Circuits, RISP International Workshop on Nonlinear Circuits, Communications and Signal Processing, Honolulu, Hawaii, March 2012

Y. Uwate, Special Session on Coupled Oscillatory Circuits and Networks, International Symposium on Nonlinear Theory and its Applications, Kobe, Japan, September 2011

Y. Uwate, Special Session on Cellular Neural Networks and their Applications, RISP International Workshop on Nonlinear Circuits, Communications and Signal Processing, Honolulu, Hawaii, March 2012

M. Storace, Special Session on Model Predictive Control on Embedded Systems (Part 1 and Part 2), 18th World Congress of the International Federation of Automatic Control (IFAC), Milan, Italy, August 2011

Invited lectures delivered

H. Asai, "Modeling and Design of Chip-Package-PCB level Signal Integrity and Power Integrity", Invited talk, Asia-Pacific Electromagnetic Compatibility, Jeju, Korea, May 2011

H. Asai, "Present Status and Future Trend of PI/SI/EMI Simulation Technology for High-Speed Electronic Design", Plenary talk, 26th International Technical Conf. on Circuits/Systems, Computers and Communications, Gyeongju, Korea, June 2011

H. Asai, "GPU-Based Acceleration of the Time-Domain Electrical Full-Wave Solvers in PI/SI/EMI Simulation", International Conf. on Electromagnetics in Advanced Applications, Torino, Italy

E. Blokhina, "A Study of Electrostatic Vibration Energy Harvesters as Nonlinear Oscillators", Invited lecture, École Supérieure d'Ingénieurs en Électronique et Électrotechnique (ESIEE), Université Paris-Est, Paris, France, September 2011

M. di Bernardo, Invited Lecture at International School on Complex Dynamics Engineering, October 2011

M. di Bernardo, Invited Plenary Lecture, International Workshop on Complex Systems and Networks, Melbourne, Australia, September 2011

M. di Bernardo, Invited Plenary Lecture, Workshop on Control of Complex Systems, University of Warwick, February 2012

C. Göknar, "Foundations of Nonlinear Circuit Theory: Passivity, Losslessness and Reciprocity", Invited lecture, University of Pavia, Italy, May 2011

C. Göknar, "Cellular Neural Networks and Two Intelligent Applications", Invited lecture, University of Pavia, Italy, May 2011

C. Göknar, "Fault Diagnosis in Digital Circuits", Invited lecture, University of Pavia, Italy, May 2011

M.P. Kennedy, "Digital Delta-Sigma Modulation: Theory and Applications", Università degli Studi di Pavia, Pavia, Italy, January 2012

M.P. Kennedy, "Digital Delta-Sigma Modulation: Theory and Applications", Università degli Studi di Napoli Federico II, Naples, Italy, April 2012

M.P. Kennedy, "What Every Electrical Engineer Should Know about Nonlinear Circuits and Systems", Seconda Università degli Studi di Napoli, Aversa, Italy, April 2012

X. Li, "Large-scale spatial epidemic in social population and interactive complex networks", International workshop on computation aspects of social and information networks, Microsoft Research Asia, Beijing, July 2011.

W.-K. Ling, "Trend study for financial data analysis via empirical mode decomposition", School of Business, University of Lincoln, September 2011.

W.-K. Ling, "Optimal pulse width modulation control for power electronics", School of Electrical, Electronic and Computer Engineering, University of Western Australia, August 2011

J. Lu, "Genetic Regulatory Networks: Some Recent Advances", Plenary Talk, International Workshop on Complex Systems and Networks, Melbourne, Australia, September 2011

J. Lu, "Modeling, Analysis and Control of Multi-Agent Systems: Some Recent Advances", Invited Talk, FoCM 2011 Workshop on Flocking, Swarming, and Control of Distributed System, Budapest, Hungary, July 2011

J. Lu, "Modeling, Analysis and Control of Multi-Agent Systems: Some Recent Advances", Plenary Talk, 7th Chinese Conference on Complex Networks, Chengdu, China, 21-24 October 2011

J. Lu, "Modeling, Analysis and Control of Multi-Agent Systems", Plenary Talk, Academic Conference on the Theories, Methods, and Engineering Practics of Complex Systems, Beijing, China, October 2011

J. Lu, "Pinning Control of Complex Dynamical Networks and Its Applications in Mechanical Systems", Invited Talk, 5th National Workshop on Dynamics and Control for Young Scholars, Qingdao, China, July 2011

J. Lu, "Consensus of Multi-Agent Systems: Some Recent Advances", Plenary Talk, Workshop on Networks Synchronization and Control, Shenzhen, China, January 2012

J. Lu, "From Complex Networks to System Biology", Plenary Talk, 8th Chinese Workshop on Networks Science, Beijing, China, April 2012

W.K.S. Tang, "A jumping gene evolutionary approach for multiobjective optimization", Keynote lecture, ICT Innovations Conference, September 2011

K. Thulasiraman, Invited Lectures at National Chiao Tung University, Tshinghua University, National Cheng Kung University and Academia Sinica, Taiwan

Lj. Trajkovic, "Understanding communication networks," IEEE Vancouver Centennial Technical Symposium, Vancouver, Oct. 2011

Lj. Trajkovic, "Spectral analysis and dynamical behavior of complex networks," International Workshop on Complex Systems and Networks, Melbourne, Australia, Sept. 2011

Lj. Trajkovic, "Teaching and learning for new generations of engineers", South China University of Technology, Guangzhou, China, July 2011

C.K. Tse, "Applications of Complex Networks Research", Singapore CAS Chapter, January 2012

C.K. Tse, "Applications of Complex Networks Research", Budapest CAS Chapter, Hungary, November 2011

C.K. Tse, "Applications of Complex Networks Research", Kansai CAS Chapter, Japan, September 2011

Website and mailing list

The Technical Committe website www.eecs.berkeley.edu/~ljilja/tcncas contains links to annual reports, meeting minutes, TC news, our vision and a list of members and their email addresses. This page continues to be maintained as we transition to the new CAS-TC website http://ieee-cas.org/community/technical-committees/ncas-tc.

The Technical Committee mailing list is ncastc-ieee@sfu.ca. Members may subscribe or unsubscribe by sending an email to ljilja@ca.sfu.ca.

Officers 2011/12

Chair: Orla Feely

Past Chair: Henry Leung

Chair Elect: Francis Lau

Secretary: Hiroo Sekiya

Track Chair for Nonlinear Circuits and Systems at ISCAS 2012: Jinhu Lu

Prepared by Orla Feely, May 2012