Annual Report of Power and Energy Circuits and Systems Technical Committee 2014/2015
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Introduction
This report of the Power and Energy Circuits and Systems (PECAS) Technical Committee of the IEEE CAS details activities of the committee and its members of the past year. The PECAS-TC members have been involved in a large number of various activities advancing and promoting the field of PECAS.

IEEE ISCAS 2015
Regular Papers: The total number of the submitted papers was 96 (6.3% of all the submissions), out of which there were 48 accepted, which resulted in acceptance rate of 50%. The 48 accepted regular papers were organized into 7 Lecture Sessions and 3 Poster Sessions.

The following the title of sessions held at ISCAS 2015:
✓ Regular Sessions:
Circuits & Systems for Energy Harvesting
Circuits & Systems for Power Systems
High Efficiency Converters and Drive Circuits
Integrated Power Circuits and Charge Pumps
Modeling, Dynamics, and Control of Power Converters I
Modeling, Dynamics and Control of Power Converters II
Wireless Power Transfer

✓ Poster Sessions:
Circuits and Systems for Solar and Wind Energy and Energy Harvesting
DC-DC converters
Power and Energy Circuits and Systems

✓ Special Sessions:
Emergent Applications of Advanced Nonlinear Theory in Smart Grids

TC member activities
During the period 2014-2015 between the ISCAS2014 at Melbourne, Australia, and the ISCAS2015 at Lisbon, Portogal, the members of the PECAS-TC co-edited 4 books, wrote 1 book chapters, (co-)edited 3 special issues, organized/took part in the organization of 7 conferences and workshops, organized 6 special sessions, and delivered 23 invited lectures in major conferences and workshops related to Circuits and Systems.

1. Books written/edited
[1]. M. K. Kazimierczuk, “RF Power Amplifiers 2-nd Ed.”, IEEE Press/John Wiley & Sons, Beijing, China, 2015.
[2]. M. K. Kazimierczuk, “High-Frequency Magnetic Components 2-nd Ed.”, IEEE Press/John Wiley & Sons, Beijing, China, 2014.
[3]. Abdelali El Aroudi, “Nonlinear vibrational energy harvesting systems for micro- and nanoscale applications”, co-edited with Elena Blokhina, and Dimitri Galayko, Eduard Alarcon, to be

published, 2015.

[4]. Luis Fernando Costa Alberto, “Stability Regions of Nonlinear Dynamical Systems Theory, Estimation, and Applications”, co-authored with Hsiao-Dong Chiang, to be published, available from August 2015.

2. Book chapters written

[1]. Hiroo Sekiya, “Wireless Power Transfer”, Section VIII, Kagakujoho-shuppan, 2014.

3. Special issues edited

[1]. Tsorng-Juu (Peter) Liang (Guest Associate Editor), IEEE Journal of Emerging and Selected Topics in Power Electronics Special Issue on Green Power Supplies, 2015.

[2]. Tsorng-Juu (Peter) Liang (Associate Editor), IEEE Journal of Emerging and Selected Topics in Power Electronics.

[3]. Hiroo SEKIYA (Guest editor) IEICE NOLTA Journal, Special section on Network Sciences and Engineering, 2015.

4. Conferences, workshops organized

[1]. Massimo Vitelli (Component of the organizing Committee), INTERNATIONAL CONFERENCE AND EXHIBITION ON ECOLOGICAL VEHICLES AND RENEWABLE ENERGIES (EVER), MONACO, 2014.

[2]. Abdelali El Aroudi (Conference chairing and organization), The Annual Seminar on Automation, Industrial Electronics and Instrumentation (SAAEI), 2014.

[3]. Wing-Kuen Ling (Technical Program Chair), IEEE Summer Course on Health Technology, 2014.

[4]. Wing-Kuen Ling (Technical Program Chair), IEEE IoT Forum, 2014.

[5]. Wing-Kuen Ling (Technical Program Chair), IEEE International Conference on Consumer Electronics, China, 2014.

[6]. Hiroo Sekita (Technical Program Secretary), The joint conference 4S-2014/AVIC2014, Ho Chi Minh, Vetnam, Oct. 22-24, 2014.

[7]. Hiroo Sekiya (General Secretary), The 2015 RISP International Workshop on Nonlinear Circuits (NCSP2015), Kuala Lumpur, Malaysia, Feb. 28- Mar. 2, 2015.

5. Special sessions organized

[1]. Luis Alberto, Applications of Advanced Nolinear System Theory to Smart Grids Session, ISCAS 2014

[2]. Abdelali El Aroudi, Nonlinear Dynamics of Interconnected Power Converters, NOLTA 2014.

[3]. Abdelali El Aroudi, Nonlinear dynamics, Bifurcations and Analysis of Chaos in Electrical and Electromechanical systems, Nolinear Structural Dynamics and Diagnostics, in Agadir 2014.

[4]. Wing-Kuen Ling, Optimization for Signal Processing, 1st Pacific Optimization Conference, 2014.

[5]. Wing-Kuen Ling, Sparse Representation and Lp Regularization Techniques, 19th International Conference on Digital Signal Processing, 2014.

[6]. Wing-Kuen Ling, Optimal Time Frequency Techniques for Signal Processing and Communications, IEEE/IET International Symposium on Communication Systems, Networks and Digital Signal Processing, 2014.

6. Invited lectures delivered

[1]. Tsorng-Juu (Peter) Liang, Distinguished Lecture, IEEE CASS, A High-Power-Factor Non-

Electrolytic-Capacitor LED Driver, 2014.
[2]. Tsorng-Juu (Peter) Liang, Distinguished Lecture, IEEE CASS, Battery Management System, 2015.
[3]. Abdelali El Aroudi, Invited lecture in Petroleum Institute, Abu Dhabi, UAE, Power Mangement in Photovoltaic Systems by Sliding Mode Control of Switching Converters.
[4]. Abdelali El Aroudi, Invited lecture in King Saud University, Ryadh, KSA, Power Processing in Photovoltaic Applications by Means of Cascaded Voltage Step-up Canonical Elements.
[5]. Wing-Kuen Ling, Optimization and Signal Processing for IoT, International Symposium of Computer Application and Information Technology, 22/1/2015.
[6]. Wing-Kuen Ling, Time frequency analysis and optimization for audio industry, Senior Course on Zigbee Intelligent Lighting System Design, Special User Group of the Internet of Things Hong Kong, 15/1/2015.
[7]. Wing-Kuen Ling, Pattern recognition: from basics to advances, Faculty of Information Engineering, Guangdong University of Technology, 25/11/2014.
[8]. Wing-Kuen Ling, Optimal time frequency representation, Department of Information Science and Mathematics, Foshan University, 30/9/2014.
[9]. Wing-Kuen Ling, Optimization and signal processing for health technology for consumer electronics, Summer Course on Health Technology, IEEE Consumer Electronics Society, 25/8/2014.
[10]. Wing-Kuen Ling, Mixed representation of big data: approach for solving optimization problems with infinite number of globally optimal solution, Department of Industrial and Manufacturing Systems Engineering, Hong Kong University, 17/7/2014.
[11]. Wing-Kuen Ling, Theoretical investigations on optimization for pattern recognition, Center for Multimedia Signal Processing, Department of Electronic and Information Engineering, Hong Kong Polytechnic University, 15/7/2014.
[12]. Wing-Kuen Ling, Joint design of space time block code and linear transciever, Department of Electronic and Computer Engineering, Hong Kong University of Technology, 15/7/2014.
[13]. Wing-Kuen Ling, Optimization for pattern recognitions, School of Information Engineering, South China University of Technology, 9/7/2014.
[14]. Wing-Kuen Ling, Optimization for signal processing and control, Institute of Cyber-Systems and Control, Department of Control Science and Engineering, Zhejiang University, 30/6/2014.
[15]. Wing-Kuen Ling, Pattern recognitions for daily applications, School of Information Engineering, Guangdong Polytechnic Normal University, 25/6/2014.
[16]. Wing-Kuen Ling, Optimization for IoT, IoT Forum, IEEE Consumer Electronics Society, 12/6/2014.
[17]. Wing-Kuen Ling, Optimization for wireless communications, Tutorial, International Conference on Consumer Electronics China, Shenzhen, 10/4/2014.
[18]. Bruno Gerard Michel Robert, Invited lecture, Analyzing Complex dynamics and chaos in electrical energy conversion systems, 15th International conference on Sciences and Techniques of Automatic control & computer engineering, STA2014, Hammamet, Tunisie, 21-23 Decembre 2014.
[19]. Ian Hiskens, Invited talk, Nonlinear, Non-smooth Dynamics of Hysteresis-Based Load Controls, AANS2014.
[20]. Indumini Ranmuthu, Invited lecture, “Driver electronics for Energy Management and Motion control,” Southern Methodist University, Dallas, Texas, Apr. 23, 2014
[21]. Indumini Ranmuthu, Invited lecture, “Driver electronics for Energy Management and Motion

control," Rice University, Houston, Texas, July 14, 2014

[22]. Indumini Ranmuthu, Invited lecture, "Driver electronics for Energy Management and Motion control," The University of Texas at Dallas, Dallas, Texas, Nov. 11, 2014

[23]. Indumini Ranmuthu, Invited lecture, "Driver electronics for Energy Management and Motion control," Stanford University, Feb, 14, 2015

Important Journal papers from PECAS-TC

We picked 15 important journal papers related with PECAS-TC.

[1]. R. Haroun, A. El Aroudi, A. Cid-Pastor, G. Garcia, C. Olalla, L. Martinez-Salamero, "Impedance Matching in Photovoltaic Systems Using Cascaded Boost Converters and Sliding-Mode Control," *IEEE Transactions on Power Electronics*, vol.30, no.6, pp.3185-3199, June 2015.

[2]. D. Giaouris, K. Mandal, S. Banerje, M. Al-Hindawi, A. Abusorrah, Y. Al-Turki, A. El Aroudi, "Analysis of Discontinuity Induced Bifurcations in a Dual Input DC-DC Converter," *International Journal of Bifurcation and Chaos*, in press, 2015.

[3]. E. Rodriguez, A. El Aroudi, E. Alarcon and H. Iu,.A Frequency Domain Approach for Controlling Fast-Scale Instabilities in Switching Power Converters, *International Journal of Bifurcation and Chaos*, in press, 2015

[4]. M. Bodetto, A. Marcos-Pastor, A. El Aroudi, J. Calvente and Luis Martienez-Salamero, Design of AC-DC PFC High-Order Converters with Regulated Output Current for Low Power Applications", I*EEE Transactions on Power Electronics*, to be published, 2015.

[5]. M. Bodetto, A. Marcos-Pastor, A. El Aroudi, A. Cid-Pastor, E. Vidal-Idiarte, "Modified Cuk Converter for High Performance Power Factor Correction Applications," *IET Power Electronics*, in press, 2015.

[6]. K. Mandal, A. El Aroudi, Al-Hindawi, A. Abusorrah, Y. Al-Turki, A. El Aroudi, D. Giaouris, S. Banerjee, "Nonlinear Modeling and Stability Analysis of Resonant DC-DC Converters," *IET Power Electronics*, in press, 2015.

[7]. Weiguo Lu, Naikuan Zhao, Junke Wu, Abdelali El Aroudi and Luowei Zhou, "Filter-based perturbation control of low-frequency oscillation in voltage-mode H-bridge DC–AC inverter," *International Journal of Circuit Theory and Applications*, in press, published online 2014.

[8]. Abdelali El Aroudi, Hassen Ouakkad, Luis Benadero and Mohammad Younis, "Analysis of Bifurcation Behavior of a Piecewise Linear Vibrator for Energy Harvesting Applications," International Journal of Bifurcation and Chaos, Vol. 24, No. 05, May 2014.

[9]. Reham. Haroun, A. Cid-Pastor, Abdelali El Aroudi, and Luis Martinez-Salamero, "Synthesis of Canonical Elements for Power Processing in DC Distribution Systems Using Cascaded Converters and Sliding Mode Control. IEEE," IEEE Transactions on Power Electronics, vol. 29, pp. 1366-1381, no. 03, March, 2014.

[10]. M. Bodetto; A. El Aroudi; A. Cid-Pastor; L. Martinez-Salamero, "High performance hysteresis modulation technique for high-order PFC circuits," Electronics Letters, Vol. 50, No. 2, p. 113 – 114, January 2014.

[11]. T. Nagashima, X. Wei, H. Tanaka, and H. Sekiya, "Locking range derivations for injection-locked class-E oscillator applying phase reduction theory," IEEE Transactions on Circuits and Systems Part I: Regular Papers, vol.61, no.10, pp.2904-2911, Oct. 2014.

[12]. M. Hayati, A. Lotfi, M. K. Kazimierczuk, and H. Sekiya, "Modeling and analysis of class-E amplifier with a shunt inductor at sub-nominal operation for any duty ratio," IEEE Transactions

on Circuits and Systems Part I: Regular Papers, vol.61, no.4, pp.987-1000, Apr. 2014.
[13]. X. Wei, T. Nagashima, M. K. Kazimierczuk, H. Sekiya, and T. Suetsugu, “Analysis and design of class-E_M power amplifier,” IEEE Transactions on Circuits and Systems Part I: Regular Papers, vol.61, no.4, pp.976-986, Apr. 2014.
[14]. Roman Kuiava, RAMOS, Rodrigo Andrade, Hemanshu R. Pota, Alberto, L.F.C., “Practical stability assessment of distributed synchronous generators under variations in the system equilibrium conditions,” International Journal of Electrical Power & Energy Systems. , v.55, p.275 - 284, 2014.
[15]. E. C. Pillco and L. F. C. ALBERTO, “On the Foundations of Stability Analysis of Power Systems in Time Scales,” IEEE Transactions on Circuits and Systems. I, Regular Papers (Print). , 2015.