



**IEEE Circuits and Systems Society
Analog Signal Processing Technical Committee**

Annual Activity Report

2006-2007

The Analog Signal Processing (ASP) Technical Committee serves to foster research, development, education and industrial dissemination of knowledge relating to the theory, analysis, design, and practical implementation of analog circuits. The scope of the ASP Committee spans from basic scientific theory to industrial application. More information on this committee can be found on the world-wide web at <http://ewh.ieee.org/soc/icss/committees/asptc>.

Committee members are experts in the analog signal processing arena that are committed to and active within this field. The committee currently has about 72 members. In 2006, Tony Chan Carusone took over from Un-Ku Moon as chair. Felix Lustenberger serves as the chair-elect and Hanspeter Schmid serves as the secretary and web coordinator.

The following summarizes CASS-related activity by the ASP committee and its members during the year 2006-2007.

1. ISCAS 2007

The Analog Signal Processing (ASP) track will once again play a dominant role in ISCAS 2007 (<http://www.iscas2007.org>), and a great majority of ASPTC members assisted in the preparation of the technical program as well as paper evaluations. During the last ASPTC meeting in Kos, Greece at ISCAS 2006 (<http://www.iscas06.org>), Hanspeter Schmid was nominated and elected by the committee as the new secretary and web coordinator. In the following year, as Felix Lustenberger is to serve as the chair, Hanspeter Schmid will serve as the chair-elect. A new secretary will be nominated and elected at our upcoming ASPTC meeting in New Orleans, Louisiana at ISCAS 2007.

As we have done in the past, once again for ISCAS 2007, current ASPTC chair Tony Chan Carusone, chair-elect Felix Lustenberger, and last year's chair Un-Ku Moon acted as Analog Signal Processing track co-chairs. These three coordinated the reviews of all papers submitted to this track. The total number of papers submitted to the Analog Signal Processing track was 418, representing 23% of all papers submitted to ISCAS 2007. Of this total, 200 papers were selected for the final program, including 70 poster presentations and 130 lecture presentations, for a 48% total acceptance rate.

The ISCAS 2007 review process for the ASP track went smoothly, primarily due to the tremendous service of the Review Committee Member (RCM) volunteers listed below:

Analog Signal Processing RCMs:

Albert Wang	Illinois Institute of Technology
Aleksandar Tasic	Delft University of Technology
Alyssa Apsel	Cornell University
Anas Hamoui	McGill University
Andreas Demosthenous	University College London
Apisak Worapishet	Manhanakorn University of Technology
Bill Eisenstadt	University of Florida

Byunghoo Jung	Purdue University
Degang Chen	Iowa State University
Felix Lustenberger	CSEM SA
Gabriel Rincon-Mora	Georgia Tech.
Gabriele Manganaro	National Semiconductor Corp.
Gaetano Palumbo	Universita' di Catania
Gert Cauwenberghs	University of California, San Diego
Gordon Roberts	McGill University
Gu-Yeon Wei	Harvard DEAS
Hanspeter Schmid	University of Applied Sciences; Institute of Microelectronics
Hoi Lee	University of Texas at Dallas
Igor Filanovsky	University of Alberta
Jafar Savoj	Rambus
Jaime Ramirez-Angulo	New Mexico State University
Jin Liu	University of Texas at Dallas
Jitkasame Ngarmnil	Mahanakorn University of Technology
Jorge Ribeiro Fernandes	Instituto Superior Te'cnico
Jose Silva-Martinez	Texas A&M University
Joseph Sylvester Chang	Nanyang Technological University
Julius Georgiou	University of Cyprus
Luis Hernandez	Carlos III University
Markus Helfenstein	Philips Semiconductors
Mohammed Ismail	The Ohio State University
P. R. Mukund	Rochester Institute of Technology
Paul Hasler	Georgia Institute of Technology
Pavan Kumar Hanumolu	Oregon State University
Ralph Etienne-Cummings	Johns Hopkins University
Ramesh Harjani	University of Minnesota
Robert Fox	University of Florida
Roman Genov	University of Toronto
Sameer Sonkusale	Tufts University
Shahriar Mirabbasi	University of British Columbia
Shanthi Pavan	Indian Institute of Technology, Madras
Shu-Chuan Huang	Tatung University
Steve Collins	University of Oxford
Tertulien Ndjountche	Quebec University at Hull
Tony Chan Carusone	University of Toronto
Tuna Tarim	Texas Instruments
Un-Ku Moon	Oregon State University
Vadim Ivanov	Texas Instruments
Yichuang Sun	University of Hertfordshire

Many ISCAS 2007 technical sessions will be chaired by ASPTC members, as listed below:

Sessions sponsored by Analog Signal Processing:

Session Name	Session Co-Chair	Session Co-Chair
Analog Circuits	William Eisenstadt	Shanthi Pavan
CAD & Tools for Analog Design	Shahriar Mirabbasi	Ethan Farquhar
IC Technology	David Graham	Tuna Tarim
Mixed Signal Circuits & Test	David Graham	Byunghoo Jung

References	Jitkasame Ngarmnil	Pavan Hanumolu
Signal Sources	Yichaung Sun	Felix Lustenberger
Amplifiers I	Un-Ku Moon	Mohammed Ismail
Amplifiers II	Andrea Baschirotto	Sameer Sonkusale
Amplifiers III	Paul Hasler	Tony Chan Carusone
Circuit Theory I	Jorge Fernandes	Hanspeter Schmid
Continuous-time Filters I	Rob Fox	Andreas G. Andreou
Continuous-time Filters II	Doug Frey	Ramesh Harjani
Wireless Circuits and Systems I	Igor Filanovsky	Albert Wang
Wireless Circuits and Systems II	Igor Filanovsky	Vadim Ivanov
Wireless Circuits and Systems III	Wouter Serdijn	Andreas G. Andreou
Wireless Circuits and Systems IV	Hanspeter Schmid	Byunghoo Jung
Wireless Circuits and Systems V	Chris Twigg	Ethan Farquhar
Interface & Sensing Circuits	Ramesh Harjani	Hoi Lee
Nyquist ADCs I	Mohammed Ismail	Luis Bica Oliveira
Nyquist ADCs II	Pavan Hanumolu	Tony Chan Carusone
Nyquist DACs I	Shanthi Pavan	Un-Ku Moon
Nyquist Data Conversion I	Jin Liu	Christal Gordon
Oversampling ADCs I	Felix Lustenberger	Tony Chan Carusone
Oversampling Data Conversion I	Shahriar Mirabbasi	Tony Chan Carusone
Oversampling Data Conversion II	Un-Ku Moon	Albert Wang
Oversampling Data Conversion III	Sameer Sonkusale	Felix Lustenberger
Non-Sampling Data Converters	Emmanuel Drakasis	Jin Liu
Communications Building Blocks	Luis Bica Oliveira	
Mixed Signal Circuits & Test II	Ralph Etienne-Cummings	
References & Regulators II	Yichaung Sun	
Amplifiers IV	Joseph S. Chang	
Amplifiers V	Milutin Stanacevic	
Analog Signal Processing	Andreas Demosthenous	
Analog Circuits III	Christal Gordon	
Circuit Theory II	Jaime Ramirez-Angulo	
Continuous-time Filters III	Randall Geiger	
Wireless Circuits and Systems VI	Emmanuel Drakasis	
Analog Interface Circuits	Degang Chen	
Nyquist Data Conversion II	Gaetano Palumbo	
Nyquist Data Conversion III	Byunghoo Jung	
Oversampling Data Conversion IV	Tertulien Ndjountche	

Other activities:

TPC members: Tony Chan Carusone, Felix Lustenberger, Un-Ku Moon

Tutorial presenters: Vadim Ivanov, Igor Filanovski, Hanspeter Schmid

Special Sessions organizers: Wouter Serdijn

2. **Other conferences, meetings and committees**

Members of ASPTC are active in organizing and coordinating many other conferences and meetings in the CAS field. These activities are summarized in the following list:

IEEE CASS Board of Governors

Ralph Etienne-Cummings

Tuna Tarim

Wouter Serdijn

IEEE CASS Distinguished Lecture Program

Tuna Tarim, Chair

IEEE CASS Conference Division and Long Term Strategy Committee

Wouter Serdijn

IEEE SSCS representative to IEEE CASS at CASS Board of Governors and SSCS AdCom

Un-Ku Moon

IEEE Custom Integrated Circuits Conference (CICC)

Ramesh Harjani, Technical Program Committee

Un-Ku Moon, Technical Program Committee

Tony Chan Carusone, Technical Program Committee

IEEE Asia-Pacific Conference on Circuits and Systems (APCCAS)

Wouter Serdijn, Technical Program Committee

European Conference on Circuit Theory and Design (ECCTD)

Jose Silva-Martinez

Gaetano Palumbo

Luis Hernandez

Andreas Demosthenous

IEEE International Conference on Field Programmable Technology (FPT 2006)

Apisak Worapishet, Publication Co-Chair

Symposium on Integrated Circuits and Systems Design (SBCCI)

Jose Silva-Martinez, Technical Program Committee

Jorge Fernandes, Technical Program Committee

International Symposium on Nonlinear Theory and its Applications

Vadim Ivanov

IASTED International Conference on Circuits Signals and Systems

Jose Silva-Martinez, Technical Program Committee member, 2007; Conference Chairman, 2006

Wouter Serdijn, Technical Program Committee

IEEE International Solid-State Circuits Conference (ISSCC)

Ralph Etienne-Cummings, Technical Program Committee member

SPIE, BIS, NIPS, COSI

Ralph Etienne-Cummings

IEEE Biomedical Circuits and Systems Conference (BioCAS)
Ralph Etienne-Cummings, Program Co-chair
Wouter Serdijn, Technical Program Committee

IEEE Midwest Symposium on Circuits and Systems
Jose Silva-Martinez, Technical Committee
Gabriel A. Rincón-Mora, Technical Program Chair
Igor Filanovski, Steering Committee and Tutorial presenter

IEEE Ph. D. Research in Microelectronics and Electronics (PRIME)
Gaetano Palumbo, Technical Program Committee

IEEE European Solid-State Circuits Conference (ESSCIRC)
Luis Hernandez

ProRISC workshop on Circuits Systems and Signal Processing
Wouter Serdijn, Technical Program Committee

3. **Editorial boards and publications**

Of particular interest to the ASPTC this year was a special section of the January 2007 IEEE Transactions on Circuits and Systems I: Regular papers, in which five analog signal processing papers appeared. Each paper is an extended version of an ISCAS 2006 publication that was solicited for the special section on the basis of excellent reviews through the regular ISCAS review process plus specific nomination by an ASPTC member. The special section was co-edited by ASPTC members Tuna Tarim and Tony Chan Carusone.

Members of the ASPTC were also active on the editorial boards of IEEE and CAS-related journals and transactions, and in promoting ASP and CAS in other publications generally, as summarized below:

Editorial boards

IEEE Transactions on Circuits and Systems I
Associate Editors: Jose Silva-Martinez, Tuna Tarim, Andre van Schaik

IEEE Transactions on Circuits and Systems II
Associate Editors: Shanthi Pavan, Gaetano Palumbo, Wouter Serdijn, Andreas Demosthenous,
Tony Chan Carusone

IEEE CASS Trans. Biomedical Circuits and Systems
Associate Editor & Journal Formation Committee: Ralph Etienne-Cummings

Analog Integrated Circuits and Signal Processing
Member of editorial board: Wouter Serdijn

Journal of Applied Research and Technology
Member of editorial board: Jose Silva-Martinez

IEEE Sensors Journal

Associate Editor: Ralph Etienne-Cummings

International Journal of Low-Power Electronics
Member of editorial board: Wouter Serdijn

VLSI Design
Member of editorial board: Jose Silva-Martinez

INE The Neuromorphic Engineer
Member of editorial board: Ralph Etienne-Cummings

The Open Electrical and Electronic Engineering Journal
Associate Editor: Andreas Demosthenous

IEEE Journal of Solid-State Circuits
Associate Editor: Un-Ku Moon

Books and book chapters

Aleksandar Tasic, Wouter A. Serdijn, John R. Long: Adaptive Low-Power Circuits for Wireless Communications, Springer, 2006, ISBN: 978-1-4020-5249-1.

Hanspeter Schmid, Alex Huber, Guido Keel: Analog Schaltungstechnik für integrierte Schaltungen, IME Windisch 2006, ISBN 3-9523090-1-X, German only.

Manisha Gambhir, Vijay Dhanasekaran, Jose Silva-Martinez and Edgar Sanchez-Sinencio, "Recent Advances in High Frequency Filters," Chapter 6 of the Book "Circuits for Emerging Technologies: CMOS and Beyond", edited by Kris Iniewski. To be published by CRC Press, 2007.

Alberto Valdes-Garcia, Jose Silva-Martinez, Edgar Sanchez-Sinencio, "On-chip testing techniques for RF wireless transceiver systems and components," Chapter 10 of the Book Test and Diagnosis of Analog and Mixed-Signal Integrated Circuits: The System on Chip Approach, Edited by Y. Sun, To be published by The Institution of Engineering and Technology, 2007.

F. Triantis, A. Demosthenous, N. Donaldson, and M. Rahal, "ENG recording amplifier configurations for tripolar cuff electrodes," in Handbook of Neural Engineering, ch. 34, Wiley/IEEE Press, pp. 555-567, Nov. 2006.

Journal publications

J. Chen, E. Sánchez-Sinencio and J. Silva-Martinez, "Frequency-Dependent Harmonic Distortion Analysis of a Linearized Cross-Coupled CMOS OTA and its Application to OTA-C Filters," IEEE Transactions on Circuits and Systems, part I, vol. 53, pp. 499-510, March, 2006.

P. Pandey, J. Silva-Martinez and S. Liu, "A 500 MHz OTA-C Fourth-Order Lowpass Filter with Class AB CMFB in 0.35 μm CMOS Technology," IEEE Transactions on Circuits and Systems, part I, vol. 53, pp. 811-820, April, 2006.

A. Valdes-Garcia, J. Silva-Martinez and E. Sánchez-Sinencio "On-chip Testing Techniques for RF Wireless Transceivers," Invited paper, IEEE Design & Test of Computers, Vol. 23, pp. 268 – 277, April 2006.

B. K. Thandri and J. Silva-Martinez, "A 92MHz, 80dB peak SNR SC bandpass $\Sigma\Delta$ modulator based on a high GBW OTA with no Miller capacitors in 0.35 μm CMOS technology," IEEE Transactions on Circuits

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J. Adut, M. Rocha-Perez and J. Silva-Martinez, “A 6th Order Broadband 10.7 MHz SC Ladder Filter,” IEEE Transactions on Circuits and Systems, part I. Vol. 53, pp. 1625 - 1635, August 2006.

B. K. Thandri and J. Silva-Martinez, “An Overview of Feed-forward Design Techniques for High-Gain Wideband Operational Transconductance Amplifiers,” Journal of Micro-electronics, Vol. 37, pp. 1018-1029, September 2006.

S. Cheng, H. Tong, J. Silva-Martinez and A. Karsilayan, “An Ultrahigh-Speed Glitch-Free Fully Differential Charge Pump with Minimum Output Current Variation and Accurate Matching,” IEEE Transactions on Circuits and Systems, part II, Vol. 53, pp. 843 - 847, Sept. 2006.

A. Lewinski and J. Silva-Martinez, “A High Frequency OTA with Robust Non-linearity Cancellation,” IEEE Transactions on Circuits and Systems part-II, Vol. 53, pp. 896 - 900, Sept. 2006.

A. Valdes-Garcia, F. Hussein J. Silva-Martinez and E. Sánchez-Sinencio, “An Integrated Frequency Response Characterization System for Analog Testing,” IEEE Journal of Solid-State Circuits, vol. 41, pp. 2301 – 2313, October 2006.

D. Baez-Villegas and J. Silva-Martinez, “Extremely Low Voltage Quasi Rail-to-Rail Operational Amplifier with a Single PMOS Input Differential Pair,” IEEE Transactions on Circuits and Systems, part II. Vol. 53, pp. 1175 - 1179, November 2006.

S. Ganesan, E. Sánchez-Sinencio and J. Silva-Martinez, “A Highly Linear Low Noise Amplifier,” IEEE Transactions on Microwave Theory and Techniques. Vol. 54, pp. 4079 – 4085, Dec. 2006.

J. Xiao, I. Mehr and J. Silva-Martinez, “A High Dynamic Range CMOS RF Variable Gain Amplifier for Mobile DTV Tuner,” IEEE Journal of Solid-State Circuits, vol. 42, pp. 292-301, February 2007.

B. K. Thandri and J. Silva-Martinez, “A 65 dB SNR, 75 mW bandpass RF $\Sigma\Delta$ ADC at 950 MHz using 3.8 GHz clock in 0.25 μm SiGe BiCMOS technology,” IEEE Journal of Solid-State Circuits, vol. 42, pp. 269-279, February 2007.

S. Cheng, H. Tong, J. Silva-Martinez and A. Karsilayan, “A Fully-Differential Low-Power Divide-by-8 Injection-Locked Frequency Divider Up to 18GHz,” IEEE Journal of Solid-State Circuits., vol. 42, pp. 583-591, March 2007.

M. Gambhir, V. Dhanasekaran, J. Silva-Martinez and E. Sánchez-Sinencio, “A 43mW, 330MHz, 24dB Programmable Boost Filter for Read Channel Applications,” IEEE Transactions on Circuits and Systems, part I, Vol. 54, pp. 458-468, March 2007.

A. Lewinski and J. Silva-Martinez, “A 30 MHz 5th-order Elliptic Low-pass CMOS Filter with 65dB Spurious Free Dynamic Range,” IEEE Transactions on Circuits and Systems, part I, Vol. 54, pp. 469-480, March 2007.

S. Zhou and G.A. Rincón-Mora, "A High Efficiency, Soft Switching DC-DC Converter with Adaptive Current-Ripple Control for Portable Applications," IEEE Transactions on Circuits and Systems II, vol. 53, no. 4, pp. 294-298, April 2006.

M. Chen and G. A. Rincón-Mora, "Accurate Electrical Battery Model Capable of Predicting Runtime and I-V Performance," IEEE Transactions on Energy Conversion, vol. 21, no. 2, pp. 504-511, June 2006.

M. Chen and G.A. Rincón-Mora, "Accurate, Compact, and Power Efficient Li-Ion Battery Charger Circuit," IEEE Transactions on Circuits & Systems II, vol. 53, no. 11, pp. 1180-1184, Nov. 2006.

H.P. Forghani-zadeh and G.A. Rincón-Mora, "Low-Power CMOS Ramp Generator Circuit for DC-DC Converters," Journal of Low Power Electronics, vol. 2, no. 3, pp. 437-441, Dec. 2006.

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- M. Clapp and R. Etienne-Cummings, "Bearing Angle Estimation for Sonar Micro-Array Using Analog VLSI Spatiotemporal Processing," *IEEE Trans. Circuits and Systems-I*, Vol. 53, No. 4, pp. 769 – 783, 2006. (IF 0.93)
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- G. Giustolisi, G. Palumbo, "Techniques for Evaluating Harmonic Distortion in Class-AB OUTPUT Stages: a Tutorial", *Analog Integrated Circuits and Signal Processing*, Vol. 47, No. 3, pp. 323-334, June 2006.
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V. Kratyuk, P. Hanumolu, U. Moon, and K. Mayaram, "Frequency detector for fast frequency lock of digital PLLs," Electron. Lett., vol. 43, no. 1, pp. 13-14, Jan. 4, 2007.

M. Brownlee, P. Hanumolu, K. Mayaram, U. Moon, "A 0.5-GHz to 0.5-GHz PLL with fully differential supply regulated tuning," IEEE J. Solid-State Circuits, pp. 2720-2728, Dec. 2006.

N. Maghari, S. Kwon, G. Temes, and U. Moon, "Sturdy MASH delta-sigma modulator," Electron. Lett., vol. 42, no. 22, pp. 1269-1270, Oct. 26, 2006.

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B. Buttgen, F. Lustenberger, P. Seitz, "Demodulation Pixel Based on Static Drift Fields", IEEE Trans. on Electron Devices, Vol.53, Iss.11, pp. 2741-2747, Nov. 2006.

4. **Other professional recognitions**

IEEE Fellow: Gaetano Palumbo

5. **2007-2008 planned activities**

ASPTC remains strongly committed to promote CAS interests in the ASP field, and assist with organizing and coordinating CASS-sponsored activities, such as ISCAS 2008. We will continue to seek close working relationships with other CASS technical committees in co-organizing events of interdisciplinary nature, as we have done for special sessions and tutorials at ISCAS and MWSCAS in recent years. We will also maintain a broader influence in other societies such IEEE-CS and IEEE-SSCS. Finally, we hope to continue with an annual special section devoted to excellent papers in the area of analog signal processing, preferably in TCAS-I.

Tony Chan Carusone, Chair
May 7, 2007