



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

**Annual Activity Report  
2004-2005**

The goal of the Analog Signal Processing (ASP) Technical Committee is to foster research, development, educational and industrial dissemination of knowledge relating to the theory, analysis, design, and practical implementation of analog circuits, and the application of analog circuit theoretic techniques to system and signal processing, ranging from basic scientific theory to industrial application. Information on the committee can be found on the world-wide web at <http://ewh.ieee.org/soc/icss/committees/asptc/index.html>.

Committee members are renown experts in analog signal processing who are both committed to, and active within, the ASP field. The committee currently has more than 50 members. In 2004, Igor M. Filanovsky took over from Wouter A. Serdijn as chair. Hanspeter Schmid remained as web coordinator and secretary.

The year 2004-2005 was again very successful for ASP. The following summarizes CASS-related activity by the committee and its members.

**1. ISCAS'2005**

As usual, the Analog Signal Processing (ASP) track thus far played and will play a dominant role in ISCAS'2005 (<http://www.iscas2005.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 Vancouver, Canada, a decision was made to assign three persons to coordinate ISCAS reviews starting ISCAS'2005. Based on this decision, current ASPTC chair, Igor Filanovsky, last year's chair Wouter Serdijn, Un-Ku Moon and Akira Hyogo acted as ISCAS'2004 Analog Signal Processing track co-chairs and coordinated the reviews of 399 papers submitted to the track. Papers (17 % of all papers submitted to ISCAS'2005) were submitted to Analog Signal Processing track, of which papers were selected for the final program.

Many ISCAS'2005 regular sessions will be chaired by ASPTC members, as listed below (even more ASPTC members will serve as co-chairs in other tracks):

*Sessions sponsored by Analog Signal Processing Technical Committee:*

Analog Signal Processing Circuits	Josef Chang, Nobukazu Takai
Data Conversion Design Techniques & Analysis	Felix Lustenberger, Sameer Sonkusale
Data Converter Application & Testing	Markus Hilfenstein, Mohammed Ismail
Error Calibration & compensation of ADCs	Eduard Alarcon, Un-Ku Moon
Pipelined ADCs	Felix Lustenberger, Un-Ku Moon
Sigma-Delta Converters I	Luis Hernandez, Sameer Sonkusale
Sigma-Delta Converters II	Ramesh Harjani, Tertulien Ndjountche
Sigma-Delta Converters III	Shantanu Chakrabartty, Luis Hernandez
Amplifiers	Gaetano Palumbo, Toshiro Tsukada
Operational Amplifiers I	Vadim Ivanov, Nobukazu Takai

Sample & Hold and Switched Capacitor Circuits  
Network Synthesis  
Continuous-Time Filters I  
Discrete-Time Filter Techniques  
Low Voltage-Low Power Filters  
Technology & RF  
Filters for Communications  
Sensors & Actuator Interface Circuits  
Voltage Regulators & References  
Analog Circuits & Systems for Wireless I  
Analog Circuits & Systems for Wireless II  
Mixed-Signal Circuits & Testing I  
Mixed-Signal Circuits & Testing II  
CAD & Other Tools for Analog Design  
Phase-Locked Loops and Timing

Tony Chan, Cosy Muto  
Igor Filanovsky, Takahide Sato  
Akira Hyogo, Khoman Phang  
Joseph Chang, Jaime Ramirez-Angulo  
Eduard Alarson, Gaetano Palumbo  
Tadashi Shibata, Aleksandar Tasic  
Tony Chan, Cosy Muto  
Ralph Etienne-Cummings, Tadashi Shibata  
Gabriel Rincon-Mora, Toshiro Tsukada  
Ramesh Harjani, P.R. Mukund  
Mourad El-Gamal, Wouter Serdijn  
P.R. Mukund, Tuna Tarim  
Markus Hilfenstein, Albert Wang  
Gordon Roberts, Tuna Tarim  
Igor Filanovsky

*Other Activities:*

TPC Members: Wouter Serdijn, Igor Filanovsky, Un-Ku Moon, Tor Sverre Lande, Ralph Etienne-Cummings, Orly Yadid-Pecht, Andreas Andreou  
Wouter Serdijn: ASP Track Chair, Tutorial organization for ISCAS'2005

## 2. Other conferences and meetings

Members of ASPTC are active in organizing and coordinating several other conferences and meetings in the CAS field. The following is just a sample

- William R. Eisenstadt, Technical Program Chairman, 64th Automated Radio Frequency Techniques Group (ARFTG) Conference, Orlando FL, Nov. 3 to Dec. 3, 2004
- William R. Eisenstadt, Technical Program Co-Chair, Workshop on Test of Wireless Circuits and Systems, Cannes, Cote d' Azure, France, June 20-30, 2005.
- Wouter Serdijn and Georges Gielen, Technical Program Committee, ProRISC Workshop on Circuits, Systems and Signal Processing (<http://www.stw.nl/prorisc/index.html>)
- A. Worapishet, Review Committee Member, IEEE TENCON 2004, Chiangmai, Thailand

## 3. Editorial boards and publications

Members of ASPTC are active on editorial boards of IEEE and CAS-related journals and transactions, in organizing special issues for journals, and promoting ASP and CAS in other publications:

### Editorial boards

#### IEEE Transactions on Circuits and Systems I:

- T.B. Tarim, Associated Editor,
- W.A. Serdijn, Associated Editor,
- Igor M. Filanovsky, Associated Editor
- Gert Cauwenbergs, Associated Editor
- Tor Sverre Lande, Associated Editor,
- Jose Silva-Martinez, Associated Editor,
- Gaetano Palumbo, Associated Editor
- O. Yadid-Pecht, Deputy Editor in Chief

## IEEE Transactions on Circuits and Systems II:

- Andreas G. Andreou, Associated Editor
- Alyssa Apsel, Associated Editor

## IEE Circuits, Devices and Systems Book Series, IEE, UK

- Yichuang Sun, Member of Editorial Board

## Analog Integrated Circuits and Signal Processing, Int. J. (Kluwer Academic Publishers,

[http://www.wkap.nl/journal\\_home.htm/0925-1030](http://www.wkap.nl/journal_home.htm/0925-1030))

- T. B. Tarim, Associate editor, Mixed Signal Letters, June 2000- June 2004
- W.A. Serdijn, Member of Editorial Board

## International Journal of Low-Power Electronics,

- W.A. Serdijn, Member of Editorial Board

## IEEE Journal of Solid-State Circuits

- Un-Ku Moon, Associate Editor, since January 2005.

## IEEE Sensors Journal ([http://www.ewh.ieee.org/tc/sensors/Sensors\\_journal.htm](http://www.ewh.ieee.org/tc/sensors/Sensors_journal.htm))

- R. Etienne-Cummings Associate

### Books and book chapters

- Ramesh Harjani, Guest Editor, Topics in High-Speed Mixed-Signal Integrated Circuits, World Scientific Publishing Company, to be published in October, 2005.
- Yongwang Ding, and Ramesh Harjani, High-Linearity CMOS RF Frontend Circuits, Kluwer Academic Publishers, October 2004
- Yichuang Sun, Editor, Test and Diagnosis of Analogue and Mixed-signal Integrated Circuits, to be published by IEE, UK
- A. Worapishet, & oth, "A Low-power Low-Voltage Bluetooth Channel Filter using Class AB CMOS Transconductors" in "Wireless Communication Circuits and Systems", ed. by Yichuang Sun, IEE London
- O. Yadid-Pecht and R. Etienne-Cummings, *CMOS Imagers: from Phototransduction to Image Processing*, Kluwer Academic Publishers, Spring 2004
- R. Etienne-Cummings, M. Clapp and V. Gruev, "Focal-Plane Analog Image Processing," in O. Yadid-Pecht and R. Etienne-Cummings, *CMOS Imagers: from Phototransduction to Image Processing*, Kluwer Academic Publishers, Spring 2004
- O. Yadid-Pecht and R. Etienne-Cummings, *CMOS Imagers: from Phototransduction to Image Processing*, Kluwer Academic Publishers, May 2004.
- I. Shcherback and O. Yadid-Pecht, "CMOS APS MTF Modeling", in O. Yadid-Pecht and R. Etienne-Cummings, *CMOS Imagers: from Phototransduction to Image Processing*, Kluwer Academic Publishers, May 2004.
- I. Shcherback and O. Yadid-Pecht, "Photoresponse Analysis and Pixel Shape Optimization for CMOS APS", in O. Yadid-Pecht and R. Etienne-Cummings, *CMOS Imagers: from Phototransduction to Image Processing*, Kluwer Academic Publishers, May 2004.
- A. Fish and O. Yadid-Pecht, "Active Pixel Sensor Design – from pixels to systems", in O. Yadid-Pecht and R. Etienne-Cummings, *CMOS Imagers: from Phototransduction to Image Processing*, Kluwer Academic Publishers, May 2004.

### Special issues

- Ramesh Harjani, Guest Editor, International Journal of High-Speed Electronics and Systems, Special issue on "High-Speed Mixed-Signal Integrated Circuits" 2004
- Ramesh Harjani, Guest Editor, Analog Integrated Circuits and Signal Processing, Special issue for the International Symposium on Circuits and Systems, 2004
- Yichuang Sun, Guest Editor, Special Issue on Analogue and Mixed-signal Test for Systems on Chip, IEE Proceedings: Circuits, Devices and Systems, August 2004.
- Yichuang Sun, Guest Editor, Special Issue on MIMO Wireless and Mobile Communications, IEE Proceedings: Communications, to be published.
- T. B. Tarim, Guest editor of the special issue entitled "ISQED'2003 special issue", published in Analog Integrated Circuits and Signal Processing, volume 42, No: 3, March 2005

- T.B. Tarim, Guest editor of the special issue entitled "Analog/mixed signal circuit design and synthesis I", published in *Analog Integrated Circuits and Signal Processing*, volume 42, No: 3, March 2005
- R. Etienne-Cummings, Guest Editor: *Kluwer's AICSP Journal*, Special Issue on Smart Sensors, July 2004

### Journal publications

- C. Cho, W.R. Eisenstadt, B. Stengel, and E. Ferrier, IIP3 Estimation from the Gain Compression Curve, *IEEE Trans on MTT*, Vol. 53, No. 4, April 2005, pp. 1197-1202.
- Y. Eo, S. Shin, W. R. Eisenstadt and J. Shim, A Decoupling Technique for Efficient Timing Analysis of VLSI Interconnects with Dynamic Current Switching, *IEEE-Trans.on CAD*, Vol. 23, No. 9, Sept. 2004, pp. 1321-1337.
- S. Shin, Y. Eo, W. R. Eisenstadt and J. Shim, Analytical Models and Algorithms for the Efficient Signal Integrity Verification of Inductance-Dominant Multi-Coupled VLSI Interconnects, *IEEE-Trans. on VLSI*, Vol. 12, No. 4, pp. 395-407, April 2004.
- A. Tasic, W.A. Serdijn and J.R. Long, Design of Multi-Standard Adaptive Voltage-Controlled Oscillators, *IEEE Transactions on Microwave Theory and Techniques*, Vol. 53, No 2, Feb. 2005, pp. 556 – 563
- A. Worapishet, P. Sirisuk, S. Tanoi, High-speed Switched-Current Matched filter for WCDMA receivers, *Electronics Letters*, vol. 40 , no. 11 , 27 May 2004, pp. 639 – 640.
- A. Worapishet, P. Sirisuk, Low Power Switched-Current FIR Core for Modern Wireless Transceivers, *IEICE Trans. on Electronics*, vol. E-87-C, no. 1, Nov. 2004, pp.1903 – 1909.
- B. Sahu and G. A. Rincon-Mora, A High-Efficiency Linear RF Power Amplifier With a Power-Tracking Dynamically Adaptive Buck-Boost Supply, *IEEE Trans. on Microwave Theory and Techniques*, pp. 112-120, vol. 52, no. 1, Jan. 2004.
- B. Sahu and G.A. Rincon-Mora, A low voltage, non-inverting, dynamic, synchronous buck-boost converter for portable applications, *IEEE Trans. on Power Electronics*, vol. 19, no. 2, pp. 443-452, Feb. 2004.
- H. W. Su and Yichuang Sun, Performance analysis and comparison of multiple loop feedback OTA-C filters, accepted by *International Journal of Circuits, Systems and Computers*.
- C.-M. Chang, B. M. Al-Hashimi, and Yichuang Sun, New high-order filter structures using only single-ended-input OTAs and grounded capacitors, *IEEE Trans. on Circuits and Systems-II*, September 2004.
- Y. He, Y. Tan, and Yichuang Sun, "Wavelet neural network approach for fault diagnosis of analogue circuits," *IEE Proceedings: Circuits, Devices and Systems*, August 2004.
- Y. He, J. Jiang, and Yichuang Sun, "A low distortion wide tuning range CMOS fully differential fourth order Bessel filters for GSM systems," *Int. J.of Analog Integrated Circuits and Signal Processing*, October, 2004.
- Byunghoo Jung, and Ramesh Harjani, Designing LC VCOs Using Capacitive Degeneration Techniques, to appear in *International Journal of High Speed Electronics and Systems*, special issue on High-Speed Mixed-Signal Integrated Circuits, October 2005.
- Yongwang Ding, and Ramesh Harjani, A CMOS High Efficiency +22dBm Linear Power Amplifier, " to appear in *Journal of Solid-State Circuits*, 2005
- Mi-Kyung Oh, Byunghoo Jung, Ramesh Harjani, and Dong-Jo Park, New Noncoherent Receiver for UWB Impulse Radio", *IEEE Communications Letters*, Vol 9, No.2, Feb. 2005
- Byunghoo Jung and Ramesh Harjani, A 20 GHz VCO with 5 GHz Tuning Range in 0.25 um SiGe BiCMOS", *IEEE Journal of Solid-State Circuits*, December 2004
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- V. Ivanov, I. Filanovsky, 2005, A 110 dB CMRR/PSRR/gain CMOS operational amplifier, Proc. IEEE Int. Symp. Circuits and Systems (ISCAS2005), May 23-26, Kobe, Japan (accepted for presentation and publication).
- L. B. Oliveira, A. Allam, I. M. Filanovsky, J. R. Fernandes, 2005, On phase noise in quadrature cross-coupled oscillators, Proc. IEEE Int. Symp. Circuits and Systems (ISCAS2005), May 23-26, Kobe, Japan.
- Md. M. Reja, A. Allam, I. M. Filanovsky, 2005, A new CMOS wideband RF front-end for multistandard low-IF wireless receivers, Proc. IEEE Int. Symp. Circuits and Systems (ISCAS2005), May 23-26, Kobe, Japan.
- V. Ivanov, Junlin Zhou, I. Filanovsky, 2004, A 110 dB CMRR CMOS operational amplifier with single-supply capability, Proc. 11th Int. Conf. Electronics, Circuits and Systems (ICECS2004), Dec. 12-15, Tel-Aviv, Israel.
- I. M. Filanovsky, A. Sachko, J. R. Long, 2004, A new configuration of two-stage wide-band amplifier with matched input and output impedances, Proc. 11th Int. Conf. Electronics, Circuits and Systems (ICECS2004), Dec. 12-15, Tel-Aviv, Israel.
- I. M. Filanovsky, X. Dong, 2004, Pulse-forming reactance network shapes a quasi-rectangular sinusoidal voltage, Proc. 11th Int. Conf. Electronics, Circuits and Systems (ICECS2004), Dec. 12-15, Tel-Aviv, Israel.
- I. M. Filanovsky, Md. Mahbub Reja, Ahmed Allam, 2004, A new configuration of CMOS two-stage wide-band amplifier, Proc. 47th IEEE Int. Midwest Symp. Circuits and Systems, July 25-28, Hiroshima, Japan, Vol. III, pp. 13-16.
- Luis Bica Oliveira, I. M. Filanovsky, C. J. M. Verhoeven, 2004, Exact calculation of amplitude and frequency of RC-oscillator with quadrature outputs, Proc. 47th IEEE Int. Midwest Symp. Circuits and Systems, July 25-28, Hiroshima, Japan, Vol. I, pp. 413-416.
- I. M. Filanovsky, X. Dong, 2004, On synthesis of reactance network shaping a monocycle pulse, Proc. 47th IEEE Int. Midwest Symp. Circuits and Systems, July 25-28, Hiroshima, Japan, Vol. I, pp.101-104

### Invited Presentations

- W. A. Serdijn, Workshop on Advances in Analog Circuit Design (AACD'2005)
- G.A. Rincon-Mora, Guest speaker to University of Puerto Rico, El Mundo es An Logo, y las Oportunidades son Muchas, Oct. 18, 2004
- G.A. Rincon-Mora, Invited Tutorial/Seminar, Dynamically Adaptive Power Supply Circuits for PA, Wireless Applications, 2005 RFIC Conference, Los Angeles, California, June 2005.
- R. Etienne-Cummings, Invited Speaker: NSF Telluride Workshop on Neuromorphic Engineering, CO, 2004.
- R. Etienne-Cummings, Invited Speaker: Neuroscience and Cognitive Sciences, University of Maryland, College Park, MD, 2004.
- R. Etienne-Cummings, Invited Speaker: Cornell University, Ithaca, NY, 2004.
- R. Etienne-Cummings, Invited Speaker: University of Sydney, Sydney, Australia, 2004.
- R. Etienne-Cummings, Invited Speaker: Edith Cowen University, Perth, Australia, 2004.
- R. Etienne-Cummings, Invited Speaker: University of Queensland, Brisbane, Australia, 2004.
- R. Etienne-Cummings, Invited Speaker: Johns Hopkins University, Baltimore, MD, 2004.
- R. Etienne-Cummings, Invited Speaker: Mitre Corporation, McClean, VA, 2004.
- R. Etienne-Cummings, Invited Speaker: NRO, Chantilly, VA, 2005.

- R. Etienne-Cummings, Invited Speaker: Agilent Corp., Palo Alto, CA, 2005.
- R. Etienne-Cummings, Invited Speaker: SPIE Conference, Orlando FL, 2005.
- R. Etienne-Cummings, Invited Speaker: NSF Grantees Meeting, Washington, DC, 2005.
- O. Yadid-Pecht, Grand challenges in CMOS Imaging, invited for ICECS2004, Tel-Aviv, Israel, December 2004.
- O. Yadid-Pecht, Active Pixel Sensors, NSF (US) – Neuromorphic Workshop – Invited instructor, July 2004.
- V. Ivanov, I. M. Filanovsky, Invited Tutorial for ICECS2004, Tel-Aviv, Israel, December 2004, Circuit techniques for amplifier speed and accuracy improvement.
- V. Ivanov, I. M. Filanovsky, Invited Tutorial for RESMIQ, Montreal, Quebec, Canada, April 2004, Amplifiers, References, LDOs-structural design approach.

#### **4. Distinguished Lecturer Program**

Several ASPTC members are part of the IEEE distinguished lecturer program:

- O. Yadid-Pecht, Distinguished Lecturer, IEEE CASS, 2004-2005.
- A. van Schaik, *Distinguished Lecturer, INE 2004.*

#### **5. Members of other Technical Committees**

- T. B. Tarim, TPC Member, IEEE International Symposium on Quality Electronic Design (ISQED),
- W. A. Serdijn, CASS (Outstanding Young Author Committee Member), BioCAS'2004 (TPC Member), ICECS'2004 (TPC member)
- G.A. Rincon-Mora, IEEE MWSCAS Technical Program Chair (2006): 49th IEEE International Midwest Symposium on Circuits and Systems (MWSCAS), Puerto Rico.
- G.A. Rincon-Mora, IEEE SSCS-CAS Chapter Vice Chairman (2003-2004): IEEE Solid-State Circuits Society Circuits and Systems (SSCS-CAS), Atlanta Chapter.
- G.A. Rincon-Mora, IEEE SSCS-CAS Chapter Chairman (2005-2006): IEEE Solid-State Circuits, Society Circuits and Systems (SSCS-CAS), Atlanta Chapter.
- Yichuang Sun, Session Chair and Prize Judge, UK-EPSRC, IEEE and IEE PREP Conference, 2004.
- Yichuang Sun, TC Member, IASTED International Conference on Wireless Networks and Emerging Technologies, Canada, 2004.
- Yichuang Sun, TC Member, IASTED International Conference on Communications, Internet, and Information Technology, Arizona, USA, November 2004
- Yichuang Sun, TC Member, IASTED International Conference on Circuits, Signals and Systems, Canada 2005.
- Yichuang Sun, TC Member, IASTED International Conference on Communications, Internet, and Information Technology, Arizona, USA, November 2005
- Yichuang Sun, TC Member, IASTED International Conference on Wireless Networks and Emerging Technologies, Canada, 2005.
- Un-Ku Moon, TPC, IEEE Custom Integrated Circuits Conference (WIRED subcommittee chair).
- R. Etienne-Cummings, Program Committee: ISSCC, SPIE, BIS, ISCAS, NIPS, COSI
- O. Yadid-Pecht, Technical Program committee member and Session Chairman: SPIE Elec. Imaging Conference, San-Jose, CA, 2005.
- O. Yadid-Pecht, Technical Program Committee member and Session Chairman: International Symposium on Circuits and Systems, 2004
- O. Yadid-Pecht, Technical Program Committee and Session chairman: IEEE Workshop on Advanced Image Sensors, Japan, 2005.
- O. Yadid-Pecht, General chair: IEEE ICECS 2004.
- L. Hernandez, ESSCIRC 2005, Grenoble, France
- L. Hernandez, SPIE Europe International Symposium Microtechnologies for the New Millennium, 9 - 11 May 2005, Sevilla, Spain
- A. van Schaik Secretary IEEE, Joint CASS and SSCC, NSW chapter, Australia

#### **6. Previous ISCAS'2004**

- O. Yadid-Pecht, TPC member and Session Chairman.
- O. Yadid-Pecht, Chair of the Technical Committee on Sensors.
- A. van Schaik, Chair Elect of the Technical Committee on Sensors, *IEEE ISCAS, 2004*
- A. van Schaik Technical Program Committee member and Session Chairman
- W. A. Serdijn, TPC member and ASP Track Co-Chair
- I. M. Filanovsky, TPC member and ASP Track Co-Chair



## **7. 2005-2006 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'2006. 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. To this end, many members of ASPTC are also members of other CASS technical committees.

*Igor M. Filanovsky, Chair*  
*April 30, 2005*