



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

**Annual Activity Report
2003-2004**

The goal of the Analog Signal Processing (ASP) Technical Committee is to foster research, development, education 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 renowned 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 2003, Wouter A. Serdijn took over from Tuna B. Tarim as chair, and Igor Filanovsky from Wouter A. Serdijn as vice-chair. Hanspeter Schmid remained as web coordinator and secretary.

The year, 2003-2004 was again very successful for ASP. The following summarizes CASS-related activity by the committee and its members.

1. ISCAS'2004

As usual, the Analog Signal Processing (ASP) track thus far played and will play a dominant role in ISCAS'2004 (<http://www.iscas2004.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 Bangkok, Thailand, a decision was made to assign three persons to coordinate ISCAS reviews starting ISCAS'2004. Based on this decision, current ASPTC chair, Wouter Serdijn, last year's chair, Tuna Tarim and vice-chair Igor Filanovsky acted as ISCAS'2003 Analog and Signal Processing track co-chairs and coordinated the reviews of the papers submitted to the track. 505 papers (= 24% of all papers submitted to ISCAS'2004) were submitted to the Analog and Signal Processing track, of which 295 papers (= 58%) were selected for the final program.

Many ISCAS'2004 regular sessions will be chaired by ASPTC members, as listed below (even more ASPTC members will serve as session co-chairs):

Sessions sponsored by Analog Signal Processing:

Pipelined ADC	Felix Lustenberger
Flash ADC	Tertulien Ndjountche
CMOS ADC	Felix Lustenberger
Current-steering DAC	Angel Rodriguez-Vazques
Digital-to-analog converters	Luis Hernandez
Sigma-delta converters II	Tadashi Shibata
ADC circuits	Un-Ku Moon
Analog-to-digital converters	Felix Lustenberger
Data converters I	Angel Rodriguez-Vazques
Data converters II	Tertulien Ndjountche

Data converters III
 Analog filtering techniques I
 Analog filtering techniques II
 Bioinspired circuits
 Filter applications
 High gain amplifiers
 High speed amplifiers
 High-frequency amplifiers
 Operational amplifiers
 Class AB amplifiers
 Voltage references
 Broadband and UWB circuits
 Oscillators
 Mixed signal testing
 Voltage and current sources I
 Voltage and current sources II
 Sensor interface circuits
 Mixed signal circuits
 RF frontend circuits
 RF power amplifiers
 Signal processing building blocks I
 Signal processing building blocks II
 Circuit theory in electronics
 General circuit theory
 Analog circuits I
 Analog circuits III
 Analog circuits IV
 High-frequency amplifiers II
 Analog circuits in systems I
 Analog circuits in systems II
 Sigma-delta converters III
 Sigma-delta converters IV
 Controlled amplifiers
 RF circuits I
 RF circuits II
 Current amplifiers
 Testing of mixed signal circuits
 Analog filtering I
 Analog circuits and technology II
 Mixed signal and sensor interface circuits

Luis Hernandez
 Tuna Tarim
 Rob Fox
 Julio Georgiou
 Tuna Tarim
 Hanspeter Schmid
 Jose Silva Martinez
 Apisak Worapishet
 Hanspeter Schmid
 Jaime Ramirez Angulo
 Vadim Ivanov
 Wouter A. Serdijn
 Bill Eisenstadt
 P.R. Mukund
 Jaime Ramirez Angulo
 Wouter Serdijn
 Alyssa Apsel
 Ramesh Harjani
 Albert Wang
 Mourad El-Gamal
 Jaime Ramirez Angulo
 Rob Fox
 Gaetano Palumbo
 Igor Filanovsky
 Tuna Tarim
 Wouter A. Serdijn
 Rob Fox
 Apisak Worapishet
 Gaetano Palumbo
 Alyssa Apsel
 Un-Ku Moon
 Tadashi Shibata
 Jose Silva Martinez
 Mourad El-Gamal
 Bill Eisenstadt
 Jaime Ramirez Angulo
 Ramesh Harjani
 Julio Georgiou
 Igor Filanovsky
 Ralph Etienne Cummings

Other activities:

- Tutorial Sessions Chair: Andreas Andreou
- Tutorial Organization: Edgar Sanchez-Sinencio, Jose Silva-Martinez, Ramesh Harjani, Orly Yadid-Pecht, Ralph Etienne-Cummings
- Invited Special Sessions Organization: Ralph Etienne-Cummings and Alyssa Apsel
- Conference advisor: Tor Sverre Lande
- TPC members: Wouter Serdijn, Igor Filanovsky, Tuna Tarim, Tor Sverre Lande, Orly Yadid-Pecht

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.

IEEE-CAS Board of Governors

Hanspeter Schmid, Ralph Etienne Cummings, Orly Yadid-Pecht

IEEE Custom Integrated Circuits Conference (CICC)

Un-Ku Moon, Technical Program Committee

IEEE DATE'2004

Georges Gielen, Program Chair

SPIE Elec. Imaging Conference, San Jose, CA, 2004

Orly Yadid-Pecht and Alyssa Apsel, Technical Program Committee

NORCHIP'2004

Tor Sverre Lande: Technical Program Chair

2004 IEEE International Workshop on Biomedical Circuits & Systems

Tor Sverre Lande: Technical Program Chair

IEEE International Symposium on Quality Electronic Design (ISQED)

Tuna Tarim: Technical Program Committee

IEEE ESSCIRC'2003

Luis Hernandez: Technical Program Committee

IEEE ISLPED

Gu-Yeon Wei: Technical Program Committee

IEEE ICECS 2004

Orly Yadid-Pecht: General Chair

Wouter Serdijn, Tuna Tarim, Igor Filanovsky, and Tor Sverre Lande: Technical Program Committee

John Harris: Special Sessions Chair

Andreas Andreou: Tutorials Chair

IEEE Workshop on Advanced Image Sensors, Germany, 2003.

Orly Yadid-Pecht: Technical Program Committee

ProRISC workshop on Circuits Systems and Signal Processing (<http://www.stw.nl/prorisc/index.html>)

Technical Program Committee: Wouter Serdijn and Georges Gielen

IEEE Bipolar/BiCMOS Circuits and Technologies Meeting (BCTM) (<http://www.ieee-bctm.org/>)

- Rob Fox, Chair of the Analog/Digital/Mixed-Signal Subcommittee
- Mourad El-Gamal, Local Arrangements Chair and Member of the Analog/Digital/Mixed-Signal Subcommittee

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 in promoting ASP and CAS in other publications:

Editorial boards

IEEE Transactions on Circuits and Systems I:

- Deputy Editor-in-chief: Orly Yadid-Pecht
- Associate editors: Gaetano Palumbo, Wouter Serdijn, Jose Silva-Martinez, Tor Sverre Lande, Gert Cauwenberghs, Igor Filanovsky, Tuna Tarim, Albert Wang,

IEEE Transactions on Circuits and Systems II:

- Deputy Editor-in-chief: Georges Gielen
- Associate editors: Un-Ku Moon, Andreas Baschiroto, Gert Cauwenberghs, Gabor Temes, Jose Silva Martinez, Un-Ku Moon, Alyssa Apsel, Andreas Andreou,

Analog Integrated Circuits and Signal Processing, Int. J. (Kluwer Academic Publishers, <http://www.wkap.nl/journalhome.htm/0925-1030>)

- Editor-in-chief: Mohammed Ismail
- Mixed signal letters editor: Tuna B. Tarim
- Editorial board: Philip Allen, Peter Aronhime, John Choma, Randall Geiger, Georges Gielen, Tor Sverre Lande, Kenneth Martin, Angel Rodriguez-Vazquez, Edgar Sanchez-Sinencio, Wouter Serdijn, Gabor Temes, Chris Toumazou, Brad Minch

Journal of Circuits, Systems and Computers

Tor Sverre Lande: member of the editorial board

Journal of Applied Research and Technology

Associate Editor: Jose Silva Martinez

NSF Telluride Neuromorphic Engineering Workshop, 2003

Organizing Committee: Ralph Etienne-Cummings

IEEE Sensors Journal (http://www.ewh.ieee.org/tc/sensors/Sensors_journal.htm)

Associate editors: Gert Cauwenberghs and Ralph Etienne-Cummings

Integration (Elsevier)

Georges Gielen: Editorial Board

Sensors (American Scientific Publishers)

Gu-Yeon Wei: Editorial Board

Books and book chapters

- O. Yadid-Pecht and R. Etienne-Cummings, CMOS Imagers: from Phototransduction to Image Processing, Kluwer Academic Publishers, May 2004
- Yadid-Pecht, O., Pain, B, Staller, C., Clark, C., and Fossum, E., “CMOS active pixel sensor star tracker with regional electronic shutter”, in CCD and CMOS Imagers, SPIE’s Milestone Series of

Selected Reprints, Moon Gi Kang, ed, pp. 54-62, 2003.

- Yadid Pecht, O., Ginosar, R., and Shacham Diamand, Y., "A random access photodiode array for intelligent image capture", in CCD and CMOS Imagers, SPIE's Milestone Series of Selected Reprints, Moon Gi Kang, ed, pp. 403-406, 2003.
- Filanovsky and V. Ivanov "Operational Amplifier Speed and Accuracy Improvement", Kluwer Academic Publishers, 2004
- Design of High Frequency Integrated Analogue Filters, edited by Yichuang Sun, IEE Press, London. Contains contributions from Yichuang Sun, Apisak Worapishet and Douglas Frey.

Special issues

- T.B. Tarim, C.H. Lin, and M. Ismail, "Robust Low Voltage Low Power Analog MOS VLSI Design", Chapter 6 in "Designs of System on a Chip: Devices and Components", Ricardo Reis and Jochen Jess (editors), Kluwer Academic Publishers, to be published in 2004
- Analog Integrated Circuits and Signal Processing: Special Issue on Smart Sensors, Spring 2004 (planned publication), guest editors: Ralph Etienne-Cummings and Orly Yadid-Pecht
- Analog Integrated Circuits and Signal Processing: ISCAS 2002 Special Issue on Analog and RF IC Design, guest editors: Wouter Serdijn, Tuna B. Tarim and Hanspeter Schmid, Vol. 35, No. 1, April 2003.
- IEEE Transactions on Circuits and Systems part-II, Special Issue on RF-Filters and Applications, October 2003.
- IEE Proceedings: Circuits, Devices and Systems: Testing of SoC: Analogue and Mixed-signal Test, August 2004, guest editor: Yichuang Sun
- Special Issue of 2002 Bipolar/BiCMOS Circuits and Technology Meeting, IEEE Journal of Solid-State Circuits
- Analog Integrated Circuits and Signal Processing: ISQED'2002 special issue on electronic design, guest editor: Tuna B. Tarim, Vol. 35, No 2/3, May 2003
- Analog Integrated Circuits and Signal Processing: Special issue, electronic design for quality, guest editor: Tuna B. Tarim, Vol. 37, No. 2, November 2003

Journal publications

- Worapishet, A.; Hughes, J.B.; Toumazou, C.; Low-power high-frequency class-AB two-step sampling switched-current techniques, IEEE Transactions on Circuits and Systems II: Analog and Digital Signal Processing, Volume: 50, Issue: 9, Sept. 2003, Pages: 649 - 653
- Chongcheawchamnan, M.; Choon Yong Ng; Bandudej, K.; Worapishet, A.; Robertson, I.D.; On miniaturization isolation network of an all-ports matched impedance-transforming Marchand Balun, Microwave and Wireless Components Letters, IEEE, Volume: 13, Issue: 7, July 2003,

Pages: 281 - 283

- Worapishet, A.; Naphaphan, C.; Current-feedback source-degenerated CMOS transconductor with very high linearity, *Electronics Letters*, Volume: 39, Issue: 1, 9 Jan. 2003, Pages: 17 - 18
- Boonsobhak, V.; Worapishet, A.; Hughes, J.B.; Reduced-kickback regenerative current comparator for high-speed switched-current pipeline analogue-to-digital converters, *Electronics Letters*, Volume: 39, Issue: 1, 9 Jan. 2003, Pages: 4 - 5
- Srisathit, S.; Chongcheawchamnan, M.; Worapishet, A.; Design and realisation of dual-band 3 dB power divider based on two-section transmission-line topology, *Electronics Letters*, Volume: 39, Issue: 9, 1 May 2003, Pages: 723 – 724.
- Lande, T.S.; Olsen, E.; Toumazou, C.; Resistive equivalents in CMOS, *Electronics Letters*, Volume: 39 Issue: 17, 21 Aug. 2003, Page(s): 1233 -1235
- Constandinou, T.G.; Lande, T.S.; Toumazou, C.; Bio-pulsating architecture for object-based processing in next generation vision systems, *Electronics Letters*, Volume: 39 Issue: 16, 7 Aug. 2003, Page(s): 1169 -1170
- M. Filanovsky, A new class of wide-band amplifiers with monotonic step response, *IEEE Trans. Circuits and Systems, Part I*, vol. 40, No. 4, pp. 569-571, 2003.
- A Feedforward Compensation Scheme for Multi-Stage Amplifiers with No-Miller Capacitors, B. K. Thandri and J. Silva-Martinez, *IEEE Journal of Solid-State Circuits*, Vol. 38, pp. 237-243, February 2003.
- A 60 mW, 150 MHz Continuous-Time Seventh Order Linear Phase Filter with Automatic Tuning System, J. Silva-Martinez, J. Adut, M. Rocha-Perez, M. Robinson and S. Rokhsaz, *IEEE Journal of Solid-State Circuits*, Vol. 38, pp. 216-225, February 2003.
- A Low-Voltage Fully Balanced OTA with Common-Mode Feedforward and Inherent Common-Mode Feedback Detector, A. Mohieldin, E. Sanchez-Sinencio and J. Silva-Martinez, *IEEE Journal of Solid-State Circuits*, Vol. 38, Issue 4, pp. 663-668, April 2003.
- A 2.4-GHz Monolithic Fractional-N Frequency Synthesizer with Robust Phase-switching Prescaler and Loop Capacitance Multiplier, K. Shu, E. Sanchez-Sinencio, J. Silva-Martinez, *IEEE Journal of Solid-State Circuits*, pp. 866-874, June 2003.
- A 1.3V, 5mW Fully-Integrated Programmable Bandpass Filter at 2.1GHz in 0.35um CMOS, F. Dülger, E. Sánchez-Sinencio and J. Silva-Martínez, *IEEE Journal of Solid-State Circuits*, pp. 918-928, June 2003.
- Compact Sub-Hertz OTA-C Filter Design with Interface-Trap Charge Pump, A. Becker-Gomez, U. Ciringiroglu, and J. Silva-Martínez, *IEEE Journal of Solid-State Circuits*, pp. 929-934, June 2003.
- A 2.7V, 1.8GHz, 4th Order Tunable LC Bandpass Filter with 0.25dB Passband Ripple, A. Mohieldin, E. Sánchez-Sinencio and J. Silva-Martínez, *IEEE J. of Solid-State Circuits*, pp. 1172-1181, July 2003.

- A 2V_{pp}, 80-200 MHz Fourth-Order Continuous-Time Linear Phase Filter With Automatic Frequency Tuning, M. Chen, J. Silva-Martínez, S. Roskhsaz and M. Robinson, *IEEE Journal of Solid-State Circuits*, pp. 1745-1749, October 2003.
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- A 270 MHz 1V_{pk-pk} Low-Distortion Variable Gain Amplifier in 0.35 μ m CMOS Process, S. T. Tan and J. Silva-Martínez, *Analog Integrated Circuits Design and Applications*, Vol. 38, pp. 149-160, February 2004.
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- Apsel and A. Andreou. "Architecture and Synthesis of Parallel 1Gbps SOS CMOS Optical Interconnects for Through Wafer Communication", *IEEE Transactions on Circuits and Systems I*, Dec. 2003.
- J. Liu, Z. Kalayjianm, B. Reily, W. Chang, G. Simonis, A. Apsel, A. Andreou. "Multi-channel Ultra-thin Silicon on Sapphire Optical Interconnects", *IEEE Journal of Selected Topics in Quantum Electronics*, Vol. 9, No. 2, March/April 2003.
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- M. Alioto - G. Palumbo, "A Simple Strategy for Optimized Design of One-Level Carry-Skip Adders", IEEE Trans. on CAS part I, Vol. 50, No. 1, pp. 141-148, January 2003.
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- R. Genov, S. Chakrabartty and G. Cauwenberghs, "Silicon Support Vector Machine with On-Line Learning," Int. J. Pattern Recognition and Artificial Intelligence, vol. 17 (3), pp. 385-404, 2003.

4. **Distinguished Lecturer Program**

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

- Gert Cauwenberghs
- Orly Yadid-Pecht
- Jaime Ramirez-Angulo

5. **2004-2005 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'2004. We will continue to seek close working relationships with other CASS technical committees in co-organizing events of inter-

disciplinary 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 on other CASS technical committees including Biomedical, CCNAC, Communications, Neural Systems, Nonlinear, Sensors, and VLSI. In 2002-2003, ASPTC has started to publish an annual special issue, preferably in IEEE-CAS, if not in other journals such as Kluwer's Analog Integrated Circuits and Signal Processing. The first of these special issues has been published in April 2003, in Kluwer's Analog Integrated Circuits and Signal Processing.

Wouter A. Serdijn, Chair
April 15, 2004