

Sensory Systems Technical Committee Annual Report

IEEE Circuits and Systems Society

Activities for May 2005 through April 2006

Chair: Andre van Schaik, University of Sydney, Australia, andre@ee.usyd.edu.au

Chair Elect: Shih-Chii Liu, Institut für Neuroinformatik, Switzerland, shih@ini.phys.ethz.ch

Secretary: Denise Wilson, University of Washington, wilson@ee.washington.edu

Secretary Elect: Bernabe Linares, National Microelectronics Center, Spain, Bernabe.Linares@imse.cnm.es

Past Chair: Orly Yadid-Pecht, Ben-Gurion University, Israel, oyp@ee.bgu.ac.il

Summary of Activities

The goal of the Sensory Systems (SS) Technical Committee is to foster research, development, education and industrial dissemination of knowledge relating to the emerging field of sensors, MEMS and associated processing systems. The activity is genuinely multidisciplinary, drawing upon knowledge and expertise from fields such as biology, physics, mechanics and chemistry, in addition to areas more traditionally associated with the IEEE such as electrical and computer engineering, computer science and information technology.

Committee members are renowned experts, who are both committed to, and active within, the field. The committee membership currently stands at 54 members. The following details the CASS-related Sensory Systems activity by the committee and its members.

1. Participation in ISCAS track paper reviews: We had a total of 67 papers originally submitted to the track. At least two reviews were arranged for each paper. The acceptance rate was 60% with 25 papers accepted for oral presentation and 15 papers accepted for poster presentation.

2. Best Paper Award:

The 10 best papers in the Sensors track (according to the reviews) were selected by the TC 2005 chair (Dr. Yadid-Pecht) and then were sent to all the TC members for uniform re-evaluation and grading. A neutral person who had no paper in the list of 10 finalists got the grading tables from the TC members and arbitered the final selection (Dr. Bernabe Linares).

The 3 best papers in the Sensory Systems track 2005 were:

1. Abhishek Bandyopadhyay, Jungwon Leez, Ryan Robuccix, Paul Hasler "A 80 μ W/frame 104x128 CMOS imager front end for JPEG Compression"
2. Yanyi Liu Wong, Marc H. Cohen, Pamela A. Abshire, "A 128_128 Floating Gate Imager with Self-Adapting Fixed Pattern Noise Reduction"
3. Alexander Fish, Shy Hamami, Orly Yadid-Pecht, "SELF-POWERED ACTIVE PIXEL SENSORS FOR ULTRA LOW-POWER APPLICATIONS"

3. Journal Special Issues: A special issue for TCASI based on the best papers from ISCAS 2005 is currently in preparation.

4. Out Reach: Members of our TC serve on program committees of various conferences such as SPIE, NIPS, ISSCC, ICECS, BIS and many others.

5. Technical Committee Membership. We have recruited a group of TC members that cover all the thrusts of our TC. The committee has members from academia, national labs and industry. We have also attempted to diversify the membership to include senior and junior scientists, as well as women and minorities. In addition, our members serve on the editorial boards of various Journals, such as IEEE TVLSI, TSensors, TCAS and AICSP journal.
(Appendix A contains a full list of current TC members)

6. Future Plans: Extend visibility of TC via special issues, books, workshops etc. Special Issue on Sensors, planned to be published through TCASI.

7. Committee members activities:

The activities by the various committee members are listed in appendix B

Appendix A

Current list of Technical Committee Members:

Chair: Andre van Schaik, University of Sydney, Australia, andre@ee.usyd.edu.au

Chair Elect: Shih-Chi Liu, Institut für Neuroinformatik, Switzerland, shih@ini.phys.ethz.ch

Secretary: Denise Wilson, University of Washington, wilson@ee.washington.edu

Secretary Elect: Bernabe Linares, National Microelectronics Center, Spain,
Bernabe.Linares@imse.cnm.es

Past Chair: Orly Yadid-Pecht, Ben-Gurion University, Israel, oyp@ee.bgu.ac.il

Pamela Abshire, University of Maryland, pabshire@umd.edu

Andreas Andreou, Johns Hopkins University, andreou@jhu.edu

Salvatore Baglio, University of Catania, salvatore.baglio@diees.unict.it

Diego Barrettino, University of Washington, diego@ee.washington.edu

Amine Bermak, The Hong Kong University of Science and Technology, eeberm@ee.ust.hk

Shantami Chakrabanty, Michigan State University, shantanu@msu.edu

Marc Cohen, University of Maryland, mhcohen@glue.umd.edu

Eugenio Culurciello, Yale University, eugenio.culuriello@yale.edu

Tobi Delbruck, ETH, Zurich, tobi@ini.phys.ethz.ch

Piotr Dudek, UMIST, United Kingdom, p.dudek@umist.ac.uk

Ralph Etienne-Cummings, Johns Hopkins University, retienne@jhu.edu

Wai-Chi Fang, JPL Caltech, U.S.A., wfang@jpl.nasa.gov

Roman Genov, University of Toronto, Canada, roman@eecg.toronto.edu

Paul Hasler, Georgia Institute of Technology, phasler@ece.gatech.edu

Martin Haenggi, University of Notre Dame, mhaenggi@nd.edu

Philipp Hafliger, University of Oslo, Norway, hafliger@ifi.uio.no

John Harris, University of Florida, harris@cnel.ufl.edu

Timothy Horiuchi, University of Maryland, timmer@isr.umd.edu

Giacomo Indiveri, ETH, Zurich, giacomo@ini.phys.ethz.ch

Tor Sverre Lande, University of Oslo, bassen@ifi.uio.no

Franco Maloberti, University of Texas-Dallas, franco.maloberti@utdallas.edu
Andrew Mason, Michigan State University, mason@msu.edu
Karim Oweiss, Michigan State University, koweiss@msu.edu
Angel Rodriguez-Vasquez, Instituto de Microelectrónica de Sevilla, angel@imse.cnm.es
Bertram Shi, Hong Kong University of Science and Technology, eebert@ee.ust.hk
Ce Kuen Shieh, National Cheng Kung University, shieh@ee.ncku.edu.tw
Alan Stocker, New York University, alan@cns.nyu.edu
Peter (Chung-Yu) Wu, National Chiao Tung University, cywu@alab.ee.nctu.edu.tw
Mona Zaghoul, George Washington University, zaghoul@gwu.edu

Appendix B

Orly Yadid-Pecht

I. 2004-2005 IEEE Circuits and Systems Society - **Distinguished Lecturer**

Invited Lectures/International Workshops

- Σ “CMOS Imagers – following Biology”, Invited lecture as IEEE Distinguished Lecturer, Hungarian Institute of Science, Budapest, Hungary, October 2005.
- Σ “CMOS Imagers – from Pixels to Systems”, Invited lecture as IEEE Distinguished Lecturer, NATIONAL MICROELECTRONICS CENTER, CNM-CSIC, SPAIN, DECEMBER 2005.

II. Publications

Peer Reviewed Papers (FROM APR 2005 only):

1. *E. Artyomov, O. Yadid-Pecht*, “Modified High-Order Neural Network for invariant pattern recognition”, *Pattern Recognition Letters*, Volume 25, pp. 343-351, MAY 2005.
2. *E. Artyomov, Y. Rivenson, G. Levi, O. Yadid-Pecht*, “Morton (Z) Scan Based Real-Time Variable Resolution CMOS Image Sensor”, *IEEE Transactions on Circuits and Systems for Video Technology*, Volume 15, Issue 7, pp. 947 – 952, July 2005
3. *A. Fish, A. Belenky and O. Yadid-Pecht*, “Wide Dynamic Range Snapshot APS for Ultra Low-Power Applications”, *IEEE TCAS II*, Vol. 52, no. 11, pp. 729-733, Nov. 2005.
4. *A. Fish and O. Yadid-Pecht*, “Bottleneck Problem Solution using Biological Models of Attention in High Resolution Tracking Sensors”, *International Journal on Information Theory and Applications*, December 2005.
5. *D. Grois, I. Shcherback, T. Danov, O. Yadid-Pecht*, “Theoretical Approach to CMOS APS PSF and MTF Modeling - Evaluation,” accepted to *IEEE Sensors journal*, March 2005.
6. *J. L. Gonzalez-Guillaumin, D. Sadowski, O. Yadid-Pecht, K. V. I. S. Kaler, M. P. Mintchev*, “Multi-channel Pressure, Bolus Transit, and pH Esophageal Catheter”, accepted to *IEEE Sensors journal*.
7. *E. Artyomov, A. Fish, O. Yadid-Pecht*, “Image sensors for security and medical applications”, accepted to *International Journal on Information Theory and Applications*.
8. *A. Fish, S. Hamami and O. Yadid-Pecht*, “CMOS Image Sensors with Self-Powered Generation Capability”, accepted to *IEEE Transactions on Circuits and Systems II*, March 2006.
9. *R. Segal, I. Shcherback, O. Yadid-Pecht*, “CMOS Image Sensors two dimensional MTF for anisotropic resolution characterization”, accepted to *IEEE Transactions on Sensors*, March 2006.
10. *A. Fish, L. Sudakov-Boresha and O. Yadid-Pecht*, "Low-power Tracking Image Sensor based on biological models of attention", accepted to the *International Journal on Information Theory and Applications*.
11. *S. Hamami, L. Fleshel and O. Yadid-Pecht*, “CMOS APS Imager employing 3.3V 12 bit 6.3 MS/s pipelined ADC”, accepted to *Sensors and Actuators*, April 2006.

Invited Papers:

- A. Fish, V. Milrud and O. Yadid-Pecht*, “High Speed and High Precision Current Winner-take-all Circuit”, invited for “The Neuromorphic Engineer”.

Peer reviewed conference papers:

1. G.R. Nelson, G.A. Jullien, O. Yadid-Pecht, "CMOS Image Sensor with Watermarking Capabilities", Proc. IEEE ISCAS, Kobe, CD ROM, Japan, May 2005.
2. J. L. Gonzalez, D. Sadowski, K. V. I. S. Kaler, M. P. Mintchev, O. Yadid-Pecht, "A CMOS Imager for Light Blobs Detection and Processing", Proc. IEEE ISCAS, CD ROM, Kobe, Japan, May 2005.
3. V. Milirud, L. Fleshel, W. Zhang, G.A. Jullien and O. Yadid-Pecht, "A Wide Dynamic Range CMOS Active Pixel Sensor with frame difference", Proc. IEEE ISCAS, CD ROM, Kobe, Japan, May 2005.
4. A. Fish, S. Hamami and O. Yadid-Pecht, "Self-Powered Active Pixel Sensors for Ultra Low-Power Applications", Proc. IEEE ISCAS, CD ROM, Kobe, Japan, May 2005 (*Best Paper Finalist Award*).
5. A. Fish, E. Avner and O. Yadid-Pecht, "Low-Power Global/Rolling Shutter Image Sensors in Silicon on Sapphire Technology", Proc. IEEE ISCAS, CD ROM, Kobe, Japan, May 2005.
6. J. L. Gonzalez, O. Yadid-Pecht, D. Sadowski, M. P. Mintchev, "Optical Impedance Sleeve Pressure Sensor for Esophageal Manometry", Proc. DDW, Chicago, USA, May 2005.
7. K.N.C. Hin, O. Yadid-Pecht, M. Mintchev, "e-Stool: Self-Stabilizing Capsule for Colonic Imaging", Neuro-stimulation Conf, France, July 2005.
8. A. Enteshari, K.V.I.S. Kaler, G.A. Jullien, O. Yadid-Pecht, "All CMOS Low Power Platform for Dielectrophoresis Bio-Analysis, IEEE ESSIRC, France, Sep 2005.
9. L. Hartley, K. V. I. S. Kaler, O. Yadid-Pecht, "Alternative Integrations for Microfluidic Cytometry", SPIE Photonics North, Toronto, 2005.

III. SERVICE ACTIVITIES

Member of the Editorial Board (**Deputy Editor in Chief**), IEEE Trans. on Circuits and Systems I, 2004-2006.

Member of the Editorial Board (**Guest Editor**), Analog Integrated Circuits and Signal Processing, 2003-2004.

Past Chair of the IEEE CAS Technical Sensors Committee (2004-2005)

IEEE Sensors Council – CAS representative

Member of the IEEE CAS Analog Signal Processing, Neural Networks, Biocas and Sensors Technical Committees (1996-present).

Member of the SPIE Solid State Sensor Arrays international conference program committee (1997-present).

Member of the Technical Committee for the IEEE workshop on CCDs and Advanced Image Sensors (1998-present).

Jan Van der Spiegel

Activities

Program Vice-Chair of the IEEE ISSCC 2006 and the Program Chair of ISSCC2007 (Feb. 2007).

Dist. Lecturer of the IEEE SSCS.

Reviewer for ISCAS06

Publications:

“GBOPCAD: A Synthesis Tool for High-Performance Gain Boosted OPAMP Design,” Jie Yuan, Nabil Farhat and Jan Van der Spiegel, *IEEE Trans. Circuits and Systems I*, Vol. 52, Issue 8, August 2005, pp 1535-1544.

“A CMOS Image Processing Sensor for the Detection of Image Features,” *Journal Analog Integrated Circuits and Signal Processing*, Vol. 43, pp. 1-17, 2005, M. Nishimura and J. Van der Spiegel.

“A 50MS/s 12-bit CMOS Pipeline A/D Converter with Nonlinear Background Calibration,” *IEEE Custom Integrated Circuit Conference (CICC 2005)*, Sept. 2005, Jie Yuan, N. Farhat and J. Van der Spiegel.

“Combined Software/Hardware Implementation of a Filterbank Front-End for Speech Recognition”, *Proc. IEEE Workshop on Signal Processing Systems (SIPS2005)*, pp. 436-441, November 2-4, Athens Greece, November 2005; A. Mouchtaris, Y. Cao, S. Khan, J. Van der Spiegel, and P. Mueller.

“A Spectral Conversion Approach to Feature Denoising and Speech Enhancement”, *Prod. 9th European Conference on Speech Communication and Technology (EUROSPEECH)*, pp. 2057-2060, September 4-8, 2005, Lisbon; A. Mouchtaris, J. Van der Spiegel, P. Mueller, and P. Tsakalides.

“Extrapolating Analog-to-Digital Converter”, *Proc. IEEE Int’l Midwest Symposium on Circuits & Systems (MWSCAS 2005)*, Cincinnati, Ohio, Aug 7 - 10, 2005; Zheng Yang, Jan Van der Spiegel.

“Real-time extraction of polarimetric information at the focal plane,” *SPIE Defense and Security Symposium on "Polarization: Measurement, Analysis, and Remote Sensing VII"* 17-22 April 2006, Orlando, Florida; Viktor Gruev, Jan Van der Spiegel and Nader Engheta.

“Fabrication of a Thin Film Micro Polarization Array,” V. Gruev, K. Wu, J. Van der Spiegel and N. Engheta, accepted *IEEE Int. Symp. Circuits and Systems (ISCAS)*, May 2006.

Piotr Dudek

ISCAS06 RCM & session chair

Technical Programme Committee member of International Conference on Sensing Technology, ICST 2005, 21-23 November 2005, Palmerston North, New Zealand,

Publications

V.D.Juncu, M.Rafiei-Naeini and P.Dudek , "Integrated circuit implementation of a compact discrete-time chaos generator", Analogue Integrated Circuits and Signal Processing, Vol.46, Issue 3, pp.275-280, March 2006

Shih-Chii Liu

ISCAS-2006: Review Committee Member for Sensory Systems, Session Chair.

Chairman of Emerging Technologies Track at NIPS Dec 2005.

Program Committee Member for SPIE International Symposium on Microtechnologies for the New Millennium 2005, Bioengineered and Bioinspired Systems II (EMT104) (9--11 May, 2005).

International Committee Member for Bio-Inspired Cognitive Systems Conference, BICS (10 Oct--14 Oct, 2006)

Editorial Board Member of Institute of Neuromorphic Engineering Newsletter

Publications:

Reichel, L., Liechti, D., Presser, K., and Liu, S-C. (2005). Range estimation on a robot using neuromorphic motion sensors, *Robotics and Autonomous Systems*, 51(2--3), pp.~167--174.

Alan Stocker

Co-organizer of the ISCAS06 special session "live demonstrations" together with Philipp Hafliger and Ralph Etienne-Cummings.

NIPS organizing committee member: co-chair of the demonstration session.

Publications:

book

"Analog VLSI circuits for the perception of visual motion", monograph, wiley & sons, 240 pages.

(<http://www.wiley.com/WileyCDA/WileyTitle/productCd-047085491X.html>)

journals:

alan stocker (2006) "Analog Integrated 2-D Optical Flow Sensor", analog integrated circuits and signal processing 46(2)

alan stocker and eero simoncelli (2006) "noise characteristics and prior expectations in human visual speed perception", nature neuroscience 9(4)

Martin Haenggi

RCM for ISCAS06

Technical Program Chair of GLOBECOM'06.

Assoc. Editor for Elsevier Journal on Ad Hoc Networks.

Distinguished Lecturer for CAS, 2005-06.

NSF CAREER Award 2005-2010 for a project entitled "Modeling and Managing Uncertainty in Wireless Sensor and Ad Hoc Networks"

Publications:

Book chapter:

M. Haenggi, "Opportunities and Challenges in Wireless Sensor Networks" in Smart Dust: Sensor Network Applications, Architecture, and Design, pp. 1-14, CRC Press, 2005

Journals:

X. Liu and M. Haenggi, "Throughput Analysis of Fading Sensor Networks with Regular and Random Topologies," EURASIP Journal on Wireless Communications and Networking, vol. 4, pp. 554-564, Aug. 2005.

D. Puccinelli and M. Haenggi, "Wireless Sensor Networks---Applications and Challenges of Ubiquitous Sensing," IEEE Circuits and Systems Magazine, vol. 5, nr. 3, pp. 19-29, Aug. 2005.

M. Haenggi and D. Puccinelli, "Routing in Ad Hoc Networks: A Case for Long Hops," IEEE Communications Magazine, vol. 43, nr. 10, pp. 93-101, Oct. 2005.

eries on Ad Hoc and Sensor Networks.

Giacomo Indiveri

Co-organizer Telluride Neuromorphic Engineering Workshop 2006,
Secretary & Web Administrator of IEEE Circuits and Systems Society Technical Committee on Neural Systems and Applications
Associate Editor for ISIC 2006 Conference
Editorial Board member of the Neuromorphic Engineering Newsletter

Publications:

Indiveri, G. and Chicca, E. and Douglas, R. A VLSI array of low-power spiking neurons and bistable synapses with spike-timing dependent plasticity , IEEE Transactions on Neural Networks, 17:(1) 211--221, Jan, 2006

Bernabe Linares-Barranco

Publications:

A. Linares-Barranco, G. Jimenez-Moreno, B. Linares-Barranco and A. Civit-Ballcells, "On Algorithmic Rate-Coded AER Generation," IEEE Transactions on Neural Networks, May 2006.

R. Serrano-Gotarredona, M. Oster, P. Lichtsteiner, A. Linares-Barranco, R. Paz- Vicente, F. Gómez-Rodríguez, H. Kolle Riis, T. Delbrück, S. C. Liu, S. Zahnd, A. M. Whatley, R. Douglas, P. Häfliger, G. Jimenez-Moreno, A. Civit, T. Serrano-Gotarredona, A. Acosta-Jiménez, B. Linares-Barranco, "AER Building Blocks for Multi-Layers Multi-Chips Neuromorphic Vision Systems" Advances in Neural Information Processing Systems, vol. 18, Y. Weiss and B. Schölkopf and J. Platt (Eds.), (NIPS'06), MIT Press, Cambridge, MA, pp. 1217--1224, 2006.

Mona Zaghoul

Elected President of the IEEE-Sensors Council

Reviewer for ISCAS06 for papers in SS track and Bio track

AE for TCAS-1

AE IEEE-Sensors Journal

Guest Editor special Issue of TCAS-I Smart Sensors with Orly Yadid-Pecht and Dennis Wilson

Ralph Etienne-Cummings

HONORS

Recipient of the Visit African Fellowship Award, University of Cape Town, 2006/2007

Selected for Fulbright Fellowship Award to South Africa, 2005/2006

Re-Elected to the Board of Governors, IEEE CAS Society, 2003-2005, 2006 – Present (Re-elected)

PROFESSIONAL ACTIVITIES

Associate Editor: IEEE Sensors Journal

Member: IEEE, Circuits and Systems, Solid-State Circuits, SPIE, Electron Devices

Reviewer: IEEE SJ, IEEE TCAS II, IEEE TNN, IEEE TRAA, IEEE TBME, IEEE IJSSC, NIPS, EWNS, ISCAS, Wiley, NSF, NIH

Program Committee: ISSCC, SPIE, BIS, ISCAS, NIPS, COSI

Promotion and Tenure Referee: Associate Professor for 2 candidates, 2005

PUBLICATIONS

Journal Publications:

1. S. Mehta and R. Etienne-Cummings, "A Normal Optical Flow Camera," accepted to IEEE Trans. Circuits and Systems-I, Fall 2005.
2. 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. PP, No. 99, Future Issue 2006.
3. S. Mehta and R. Etienne-Cummings, "Normal Optical Flow Camera," IEE Electronics Letters, Vol. 41, No. 13, pp. 732 – 733, June 2005.
4. R. Philipp and R. Etienne-Cummings, "A Single Chip Stereo Imager" ISSCC'06 Digest of Technical Papers, Vol. 49, Feb 2006.
5. R. Philipp and R. Etienne-Cummings, "Second Generation Single-Chip Imager," accepted for IEEE ISCAS 2006, Kos, Greece, May 2006.
6. F. Tenore, J. Vogelstein, R. Etienne-Cummings, G. Cauwenberghs and P. Hasler, "A Floating-Gate Programmable Array of Silicon Neurons for Central Pattern Generating Networks," accepted for IEEE ISCAS 2006, Kos, Greece, May 2006.
7. M. Chi, U. Mallik, E. Choi, M. Clapp, G. Cauwenberghs and R. Etienne-Cummings, "CMOS Pixel-Level ADC with Change Detection," accepted for IEEE ISCAS 2006, Kos, Greece, May 2006.
8. N. Ekekwe, R. Etienne-Cummings and P. Kazanzides, "A Configurable VLSI Chip for DC Motor Control for Compact, Low-Current Robotic Systems," accepted for IEEE ISCAS 2006, Kos, Greece, May 2006.
9. J. Vogelstein, R. Etienne-Cummings and A. Cohen, "Dynamic Control of Spinal Locomotion Circuits," accepted for IEEE ISCAS 2006, Kos, Greece, May 2006.
10. S. Mehta and R. Etienne-Cummings, "Normal Flow Measurement Visual Motion Sensor" accepted for IEEE ISCAS 2006, Kos, Greece, May 2006.
11. V. Gruev, R. Philipp and R. Etienne-Cummings, "General Image Processing Chip in 3D Integration," accepted for IEEE ISCAS 2006, Kos, Greece, May 2006.
12. A. Lewis, F. Tenore and R. Etienne-Cummings, "CPG Design using Inhibitory Networks," Int. Conf. Robotics and Automation, Barcelona, Spain, 2005.

13. R. Etienne-Cummings, "Neuromorphic Vision Systems," Workshop on Neuromorphic Systems, IJCNN'05, Montreal, Canada, August 2005.
14. R. Vogelstein, N. Thakor, R. Etienne-Cummings, and A. Cohen, "Electrical Stimulation of a Spinal Central Pattern Generator for Locomotion," Proc. 2nd International IEEE EMBS Conference on Neural Engineering. Arlington, VA, March 2005.

Workshops/Conferences/Panels/Invited Talks:

Session Chairman: International Symposium on Circuits and Systems, 2005

Invited Speaker: SPIE Conference, Orlando, FL, 2005

Invited Speaker: Post IJCNN Neuromorphic Workshop, Montreal, Canada, 2005

Invited Speaker: NRO, Chantilly, VA, 2005.

Invited Speaker: Agilent Corp., Palo Alto, CA, 2005.

Invited Speaker: SPIE Conference, Orlando FL, 2005.

Invited Speaker: NSF Grantees Meeting, Washington, DC, 2005.

Invited Speaker: Columbia University, NY, 2005.

Invited Speaker: NASA, Goddard, MD, 2005.

Invited Speaker: Workshop on Neuromorphic Systems, IJCNN'05, Montreal, Canada, 2005.

Invited Speaker: ETHZ-INI/INE Workshop, Zurich, Switzerland, 2005.

Invited Speaker: National Society of Black Engineers, Greenbelt, MD, 2005.

Review Panel: NIH SBIR Panel, Washington, DC, Nov 2005.

Organizer: NSF Telluride Neuromorphic Engineering Workshop, Telluride, CO, 2003, 2004, 2005.

Organizer: Topical Meeting on Time Domain Neural Signal Processing, Zurich, Switzerland, 2005.

Organizer: ISCAS 2005, Special Sessions on Sensory Systems for Biological Applications, Kobe, Japan, May 2005.

Organizer: ISCAS 2005, Demonstration Sessions on Sensory Systems, Kobe, Japan, May 2005.

Organizer: ISCAS 2006, Special Sessions on Sensory Systems for Biological Applications, Kos, Greece, May 2006.

Organizer: ISCAS 2006, Demonstration Sessions on Sensory Systems, Kos, Greece, May 2006.

PATENTS

1. R. Etienne-Cummings, M. A. Lewis and P. Pouliquen, "Color Segmentation, Histogramming and Object Recognition System," Patent #6897426, May 2005.

André van Schaik

Chair IEEE CAS Sensory Systems TC

Member, IEEE CAS Technical Committees: Analogue Signal Processing, Biomedical Circuits and Systems, Neural Systems and Applications

Track Chair, Sensory Systems IEEE ISCAS06

AE IEEE TCASI

Board Member, Institute of Neuromorphic Engineering

Organizer, Telluride Neuromorphic Engineering Workshop

Member EPSRC peer review college

Publications:

Journal papers:

1. V. Best, A. van Schaik, C. Jin, S. Carlile, "Auditory Spatial Perception with Sources Overlapping in Frequency and Time," *Acta Acustica*, Vol. 91, No. 3, 2005, pp 421-428.
2. T. Delbrück and A. van Schaik, "Bias Current Generators with Wide Dynamic Range," *Analog Integrated Circuits and Signal Processing*, Vol. 43, 2005, pp 247-268. **Invited paper.**
3. V. Best, S. Carlile, C. Jin, A. van Schaik, "The role of high frequencies in speech localization," *Journal of the Acoustical Society of America*, Vol 118, 2005.

Conference papers:

4. A. van Schaik and S-C Liu, "AER EAR: A Matched Silicon Cochlea Pair with Address Event Representation Interface," *Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS 2005)*, May 2005, Kyoto, Japan.
5. Craig Jin, Teewoon Tan, Alan Kan, Dennis Lin, Andre van Schaik, Keir Smith, Matt McGinity, Real-time, head-tracked 3D Audio with Unlimited Simultaneous Sounds, ICAD 05, Eleventh Meeting of the International Conference on Auditory Display, Limerick, Ireland, July 6-9 2005
6. S. Carlile, C. Jin, A. van Schaik, "The role of high-frequency information in talker localisation and segregation: bandwidth requirements for multi-source 3D audio," In *Proceedings of the 11th International Conference on Human-Computer Interaction*, July 22-27, 2005.
7. Richard Reeve, André van Schaik, Craig Jin, Tara Hamilton, Ben Torben-Nielsen, Barbara Webb, "Directional Hearing in a Silicon Cricket," *Proceedings of the Sixth International Workshop on Information Processing in Cells and Tissues (IPCAT05)*, 30/8-1/9, 2005.
8. André van Schaik, Richard Reeve, Craig Jin, Tara Hamilton, "An AVLSI Cricket Ear Model," *Proceedings of the Neural Information Processing Systems Conference (NIPS'05)*, December 2005.