Sensory Systems Technical Committee Annual Report

IEEE Circuits and Systems Society

Activities for May 2007 through April 2008

Chair : Shih-Chii Liu, Institut für Neuroinformatik, Switzerland, shih@ini.phys.ethz.ch
Chair-Elect: Bernabe Linares-Barranco, National Microelectronics Center, Spain, bernabe@imse.cnm.es
Secretary: Tobi Delbruck, Institut für Neuroinformatik, Switzerland, tobi@ini.phys.ethz.ch
Secretary Elect: Teresa Serrano-Gotarredona, National Microelectronics Center, Spain, terese@imse.cnm.es
Past Chair: Andre van Schaik, University of Sydney, Australia, andre@ee.usyd.edu.au

Annual Meeting: At ISCAS 2008, Seattle, 19:30 on 19 May 2008.

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 38 active members, down from 54 last year. The members voted during the annual meeting at ISCAS07 to modify the bylaws that govern the status of active members. This bylaw has been altered to "A member is removed from the committee if he/she does not attend three consecutive annual committee meetings or does not participate in the reviewing activities for three consecutive years". In addition 3 new members were welcomed to the committee at ISCAS07.

The following details the CASS-related Sensory Systems activity by the committee and its members.

1. Participation in ISCAS track paper reviews:

The Sensory Systems Track received 58 submissions at ISCAS 2008. At least three reviews were arranged for each paper. With 6 Sensory System Sessions (4 oral, 2 posters), we had 5*6=30 accepted. Actually we had 31 accepted (one paper went into a special session). The acceptance rate was 31/58=53%. This acceptance rate was slightly higher than the average acceptance rate of the conference. In addition, 3 special sessions proposals were accepted including the demonstration track session which has now been extended to include submissions from other technical tracks.

2. Best Paper Award:

The 11 best papers in the Sensors track (according to the reviews) were selected by the TC 2008 Sensory Systems track chair (Dr. van Schaik & Dr. Liu) based on the feedback on all papers from the reviewers and Review Committee Members. These 11 papers were then re-examined by the technical committee members, Drs. Liu, van Schaik, Linares-Barranco, Delbruck, Serrano-Gotarredona, and in addition, 4 other committee members , each examining 6 papers, so that each paper would receive 5 reviews. Examining of a (co-)author's paper by the author was avoided. Each examiner ranked the 6 papers assigned with the best ranked paper receiving 6 points and the lowest ranked paper 1 point. The

paper's points were tallied and the highest scoring paper has been selected as the best Sensory Systems track paper for 2008.

The best paper goes to "A sub-uW Fully Programmable CMOS DPS for Uncooled Infrared Fast Imaging" by Josep Maria Margarit, Lluis Teras, Francisco Serra-Graells, from the Institute of Microelectronica, Barcelona.

The next ranked 2 papers are awarded honorary mentions.

The first honorary mention goes to paper "A 64x64 Pixel Temporal Contrast Microbolometer Infrared Sensor" by Daniel Matolin, Christoph Posch, Rainer Wohlgenannt, Thomas Maier, from Austrian Research Centers, GmBH – ARCS.

The second Honorary Mention goes to paper "Image Sensor with Focal Plane Change Event Driven Video Compression" by Yu M. Chi, Ralph Etienne-Cummings, Gert Cauwenberghs, from the University of California, San Diego and Johns Hopkins University.

3. Journal Special Issues:

4. Out Reach:

Members of our TC serve on program committees of various conferences such as SPIE, NIPS, ISSCC, ICECS, BICS 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.

7. Committee member activities:

The activities by the various committee members are listed in **Appendix B**. 3 of the members are on the IEEE CAS Distinguished Lecturer Program.

8. Special Session on Live Demonstrations of Circuits and Systems.

The ISCAS awards committee (not SSTC) awarded the best 2007 demonstration to the paper

> "Data Matrix Code Recognition Using the Eye-RIS Vision System", Amanda Jiménez- Marrufo, Ainhoa Mendizábal, Sergio Morillas-Castillo, Rafael Dominguez-Castro, Servando Espejo, Rafael Romay-Juarez, Angel Rodriguez-Vasquez. (AnaFocus)

The following two demos received honorary mentions:

"Thresholded Samplers for UWB Impulse Radar", Håkon André Hjortland, Dag Trygve Wisland, Tor Sverre Lande, Claus Limbodal, Kjetil Meisal (University of Oslo)

And

"An On-line, Multi-Parametric, Multi-Channel Physicochemical Monitoring Platform for Stem Cell Culture Bioprocessing", Xicai Yue, Emmanuel Drakakis, Hua Ye, Mayasari Lim, Athauassios Mantalaris, Nicki Panoskaltsis, Anna Radomska, Chris Toumazou, Tony Cass (Imperial College London)

The 2008 special session "Live Demonstrations of Circuits and Systems" was sponsored by the SSTC, the TC Biomedical Circuits and Systems, and the TC Multimedia Systems and Applications.

The 2008 demonstration track (http://groups.google.com/group/iscas2008demos) has 16 demonstrations accepted out of 21 submissions (an acceptance rate of 76%). Papers were reviewed by the special session reviewers and not by the demonstration track organizers or SSTC. The demo track represents 9 of 16 total TCs: Sensory Systems, Biomedical Circuits and Systems, Analog Circuits and Systems, VLSI Systems and Applications, Neural Systems and Applications, Multimedia Systems and Applications, Cellular Networks and Array Computing, Sensors, and Life Sciences and Applications.

There were no demos from TCs Visual Signal Processing and Communications, Power Systems and Power Electronic Circuits, Nonlinear Circuits and Systems, Nanoelectronics and Gigascale Systems, Digital Signal Processing, Circuits and Systems for communication, Computer Aided Network Design, or Blind Signal Processing.

Appendix A: List of members

The following list of members does not include new members approved at the ISCAS 2008 meeting. The up to date list is maintained on the SSTC web site: http://ewh.ieee.org/soc/icss/committees/sensors/sensors-tc.php.

Chairman	**Shih-Chii Liu** Institute for Neuroinformatics University of Zurich/ETH Zurich Winterthurerstr 190 8057 Zurich Switzerland Email: shih@ini.phys.ethz.ch
Chair-Elect	**Bernabe Linares-Barranco** Instituto Microelectronica Sevilla (IMSE) National Microelectronics Center, CNM-CSIC Ed. CICA, Av. Reina Mercedes s/n 41012 Sevilla, Spain E-mail: bernabe@imse.cnm.es
Secretary	**Tobi Delbruck** Institute for Neuroinformatics University of Zurich/ETH Zurich Winterthurerstr 190 8057 Zurich Switzerland Email: tobi@ini.phys.ethz.ch
Secretary-Elect	**Teresa Serrano-Gotarredona** Instituto Microelectronica Sevilla (IMSE) National Microelectronics Center, CNM-CSIC Ed. CICA, Av. Reina Mercedes s/n 41012 Sevilla, Spain E-mail: terese@imse.cnm.es
Past Chair	**André van Schaik** School of Electrical and Information Engineering Sydney University NSW 2006 AUSTRALIA Email: andre@ee.usyd.edu.au
Technical Committee Members	
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 Glasgow d.barrettino@elec.gla.ac.uk
Amine Bermak	The Hong Kong University of Science and Technology eebermak@ee.ust.hk
Shantami Chakrabartty	Michigan State University shantanu@msu.edu
Jennifer M. Blain Christen	Arizona State University jennifer1@asu.edu
Marc Cohen	University of Maryland mhcohen@glue.umd.edu
Timothy Constandinou	Imperial College London t.constandinou@ic.ac.uk
Eugenio Culurciello	Yale University eugenio.culuriello@yale.edu
Tobi Delbruck	ETH, Zurich tobi@ini.phys.ethz.ch
Piotr Dudek	The University of Manchester p.dudek@manchester.ac.uk
Ralph Etienne-Cummings	Johns Hopkins University retienne@jhu.edu
Wai-Chi Fang	JPL Caltech, U.S.A. wfang@jpl.nasa.gov
Alex Fish	ATIPS Labs, University of Calgary fish@atips.ca
Roman Genov	University of Toronto,Canada roman@eecg.toronto.edu
Maysam Ghovanleo	North Carolina State University mghovan@ncsu.edu
Viktor Gruev	University of Pennsylvania vgruev@seas.upenn.edu
Martin Haenggi	University of Notre Dame mhaenggi@nd.edu
Philipp Hafliger	University of Oslo, Norway hafliger_at_ifi.uio.no
John Harris	University of Florida harris@cnel.ufl.edu
Paul Hasler	Georgia Institute of Technology phasler@ece.gatech.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
Christoph Posch	Austria Research Corporation Christoph.Posch@arcs.ac.at
Khaled Salama	Rensaleer Polytechnic Institute khaled@ecse.rpi.edu
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
Milutin Stanacevic	SUNY, Stonybrooke milutin@ece.sunysb.edu
Alan Stocker	New York University alan@cns.nyu.edu
Peter (Chung-Yu) Wu	National Chiao Tung University cywu@alab.ee.nctu.edu.tw
Orly Yadid-Pecht	Ben-Gurion University oyp@ee.bgu.ac.il
Mona Zaghloul	George Washington University zaghloul@gwu.edu

Appendix B: member activities

Of the 38 active members, 19 submitted activity reports.

Bernabe Linares-Barranco 2008

IEEE Services/Activities:

AE for IEEE TNN, Secretary SSTC

Journal Publications:

J. A. Leñero-Bardallo, T. Serrano-Gotarredona, and B. Linares-Barranco, "A Calibration Technique for Very Low Current and Compact Tunable Neuromorphic Cells. Application to 5-bit 20nA DACs," IEEE Trans. Circuits and Systems, Part-II: Brief Papers, in Press. 2008.

R. Serrano-Gotarredona, T. Serrano-Gotarredona, A. Acosta-Jimenez, C. Serrano-Gotarredona, J. A. Perez-Carrasco, A. Linares-Barranco, G. Jimenez-Moreno, A. Civit-Ballcels, and B. Linares-Barranco, "On Real-Time AER 2D Convolutions Hardware for Neuromorphic Spike Based Cortical Processing," IEEE Trans. on Neural Networks, in Press. June 2008.

R. Serrano-Gotarredona, L. Camuñas-Mesa, T. Serrano-Gotarredona, J. A. Leñero-Bardallo, and B. Linares-Barranco, "The Stochastic I-Pot: A Circuit Block for Programming Bias Currents," IEEE Trans. Circuits and Systems, Part-II: Brief Papers, vol. 54, No. 9, pp. 760-764, September 2007.

Bernabe Linares-Barranco and Teresa Serrano-Gotarredona <http://www.imse.cnm.es/%7Eterese>, "On an Efficient CAD Implementation of the Distance Term in Pelgrom's Mismatch Model,"IEEE Trans. on CAD, vol. 26, No. 8, pp. 1534-1538, August 2007. <http://www.imse.cnm.es/%7Ebernabe/tcad07.pdf>

J. Costas-Santos, T. Serrano-Gotarredona, R. Serrano-Gotarredona and B. Linares-Barranco, "A Spatial Contrast Retina with On-chip Calibration for Neuromorphic Spike-Based AER Vision Systems," IEEE Trans. Circuits and Systems, Part-I: Regular Papers, vol. 54, No. 7, pp. 1444-1458, July 2007. <http://www.imse.cnm.es/%7Ebernabe/tcas1_07.pdf>

Alejandro Linares-Barranco, Matthias Oster, Daniel Cascado, Gabriel Jimenez, Anton Civit, Bernabe Linares-Barranco, "Inter-Spike-Intervals Analysis of AER Poisson like Generator Hardware," Neurocomputing, 70, pp. 2692-2700, May 2007.

Amine Bermak 2008

Professional activities

General Chair at the "2008 IEEE International Conference on Electronic Design, Test and Applications", Hong Kong.
Member of Technical Program Committee of: "Design Automation and Test in Europe", DATE'2007-2008, "IEEE International Conference on Consumer Electronics", ICCE'2007-2008; "IEEE Custom Integrated Circuit Conference", CICC'2006/2007; "IEEE Internal Workshop on Electronic Design, Test and Applications", DELTA'2008.
Member of the IEEE CAS Technical Achievement Award Committee (2008).
Member of the IEEE CAS Sensory systems Technical Committees (2005-present).

Board memberships:

Associate Editor IEEE Transactions on Very Large Scale Integration (VLSI) Systems.
Associate Editor IEEE Transactions on Biomedical Circuits and Systems.
Associate Editor Journal of Sensors.

Publications

Journal papers:

S. Chandrasekaran, A. Amira **A. Bermak** and *M. Shi* "An Efficient VLSI Architecture and FPGA Implementation of the Finite Ridgelet Transform" To appear in Journal of Real-Time Image Processing"

M. Shi, **A. Bermak**, *S. Chandrasekaran* and A. Amira, "A Committee Machine gas identification System Based on Dynamically Reconfigurable FPGA," To appear in *IEEE Sensors Journal*.

S. Chen, F. Boussaid(*) and **A. Bermak**, "Robust Intermediate Read-out for Deep Submicron CMOS Image Sensors," To appear in *IEEE Sensors Journal*.

B. Guo, **A. Bermak**, P.C.H. Chan and G. Yan, "Characterization of Integrated Tin Oxide Gas Sensors with Metal Additives and Ion Implantations", To appear in *IEEE Sensors Journal*.

S. Chen, and **A. Bermak**, "Arbitrated Time-To-First Spike CMOS Image Sensor with On-Chip Histogram Equalization," *IEEE Transactions on Very Large Scale Integration Systems*, Vol. 15, Issue 3, pp.346-357, March 2007.

S. Chen, **A. Bermak**, *W. Yan* and D. Martinez, "Adaptive-Quantization Digital Image Sensor for Low-Power Image Compression," *IEEE Transactions on Circuits and Systems*, part I: Regular papers, Vol. 54, Issue 1, pp.13-25, Jan. 2007.

B. Guo, **A. Bermak**, G. Yan and P. C.H. Chan, "A Monolithically integrated 4x4 Tin Oxide Gas Sensor Array with on-chip multiplexing and Differential Readout Circuits," *Solid-State Electronics*, Vol 51, pp. 47-54, January, 2007.

B. Guo, **A. Bermak**, P. Chan and Gui-Zhen Yan, "An Integrated Surface Micro-machined Convex Micro-hotplate Structure for Tin Oxide Gas Sensor Array, *IEEE Sensors Journal*, Vol. 7, No.12, pp.1720-1726, Dec. 2007.

X. Zhao, **A. Bermak** and F. Boussaid[(*)], "Characterization of an integrated CMOS triple-well color processing scheme for skin detection," *IEEE Sensors Journal*, Vol. 7, No. 11, pp. 1471-1474, November 2007

M. Susli, F. Boussaid[(*)], *S. Chen* and **A. Bermak**, "Arbitrated AER Image Coding Schemes", in *Signal Processing for Image Enhancement and Multimedia Processing*, Multimedia Systems and Applications Series, vol. 34, Chapter 27, Springer Verlag, 2007.

Peer reviewed conference papers:

M. Law and A. Bermak, "A Time Domain Differential CMOS Temperature Sensor with Reduced Supply Sensitivity"" Accepted at the IEEE International Symposium on Circuits and Systems ISCAS2008, Seattle, USA, 2008

Yan Wang, Shoushun Chen and Amine Bermak, "Novel VLSI Implementation of Peano-Hilbert Curve Address Generator", IEEE International Symposium on Circuits and Systems, May 19-21, 2008, Seattle, USA

Milin Zhang and **A. Bermak**, "Architecture of a Digital Pixel Sensor Array with Tile-Based Vector Quantization Image Compression Algorithm", 9th Biennial Conference of the Australian Pattern Recognition Society on Digital Image Computing Techniques and Applications, pp.541-546, Dec. 2007, Adelaide

M. Susli, F. Boussaid[(*)], *S. Chen* and **A. Bermak**, "Efficient Event-Driven Frame Capture for CMOS Imagers," *9th International Symposium on signal processing and its applications*, Sharjah, UAE, Feb. 2007.

S. Chandrasekaran, A. Amira, *M. Shi*, and **A. Bermak**, "Performance Enhanced Voltage Scaling in FPGAs" Accepted at the *International Symposium on Integrated Circuits (ISIC 2007)*, pp. 477-480, Singapore, 2007.

M. Shi, **A. Bermak**, *S. Chandrasekaran* and A. Amira, "FPGA Based Run Time Reconfigurable Gas Discrimination System" *International Symposium on Integrated Circuits (ISIC 2007)*, pp. 180 – 183, Singapore, 2007.

X. Zhao, F. Boussaid[(*)] and **A. Bermak,** "A 0.18um CMOS on-chip skin detection scheme based on npnp-triple-junction structure" *International Symposium on Integrated Circuits (ISIC 2007)*, pp. 333-336, Singapore, 2007.

Y. Wang, S. Chen, and **A. Bermak**, "FPGA Implementation for Image Compression using DPCM and FBAR" Accepted at the *International Symposium on Integrated Circuits (ISIC 2007)*, pp. 329-332, Singapore, 2007.

F. Flitti and **A. Bermak**, "Face Detection Using a Classifiers cascade based on vector angle measure and multi-modal representation" *IEEE Workshop on Signal Processing Systems*, pp. 539-542, Shanghai, China, 2007.

H. L. Hu, **A. Bermak** and D. Martinez, "A new video Compression Scheme combining conditional replenishment and address event representation" Accepted at the *IEEE Workshop on Signal Processing Systems*, pp. 573-578, Shanghai, China, 2007.

F. Flitti, B. Guo, A.B. Far and **A. Bermak**, "A new Gas Recognition Technique using On Chip Sensor Array Measurements", *IEEE Sensors Journal*, 14th IEEE International Conference on Electronics, Circuits and Systems, pp. 50-53, Marrakech, Morocco, Dec 2007.

Zhou Shun, Oliver A. Pfander, Hans-Jorg Pfleidere and **Amine Bermak**, "A VLSI architecture for a Run-time Multi-precision Reconfigurable Booth Multiplier", *IEEE Sensors Journal*, 14th IEEE International Conference on Electronics, Circuits and Systems, pp. 975-978, Marrakech, Morocco, Dec 2007.

J. Lu, **A. Bermak**, M. Lu, Y.K. Lee " Study of Piezoresistance Effect of Carbon Nanotube-PDMS Composite Materials for Nanosensors" *7th IEEE International Conference on Nanotechnology*, 2007.

S. Chen, Y. Wang and **A. Bermak**, "A CMOS Image Sensor with on Chip Image Compression Based on Predictive Boundary Adaptation and QTD Algorithm" *6th IEEE Conference on Sensors*, pp. 531 – 534. Georgia, USA, Oct. 2007.

B. Guo and **A. Bermak** and D. Martinez, "A 4x4 Logarithmic Spike Timing Encoding Scheme for Olfactory Sensor Applications" Accepted at the *IEEE International Symposium on Circuits and Systems ISCAS2007*, pp. 3554-3557, New Orleans, USA, 2007.

M. Law and **A. Bermak**, "A CMOS Image Sensor Using Variable Reference Time Domain Encoding" Accepted at the *IEEE International Symposium on Circuits and Systems ISCAS2007*, pp. 2399-2402, New Orleans, USA, 2007.

M. Lu[(*)], **A. Bermak** and Y.K. Lee, "Fabrication Technology of Piezoresistive Conductive PDMS for Micro Fingerprint Sensors"

Diego Barrettino 2008

Professional Activities:

Reviewer for the IEEE Journal of Solid-State Circuits.
Reviewer for the IEEE Sensors Journal.
Reviewer for the IEEE Transactions on Biomedical Engineering.
Reviewer for the IEEE Transactions on Circuits and Systems I. Publications:

Publications

Books:

M. Graf, D. Barrettino, H. Baltes, and A. Hierlemann, CMOS Hotplate Chemical Microsensors, Springer-Verlag, Heidelberg, Germany. Series: Microtechnology and MEMS, ISBN: 978-3-540-69561-5, March 16, 2007.

Journal Publications:

D. Barrettino, P. Malcovati, M. Graf, S. Hafizovic, and A. Hierlemann, “CMOS-Based Monolithic Controllers for Smart Sensors Comprising Micromembranes and Microcantilevers,” IEEE Transactions on Circuits and Systems I: Regular Papers, Vol. 54, pp. 141-152, 2007.

Y. Li, C. Vancura, D. Barrettino, M. Graf, C. Hagleitner, A. Kummer, M. Zimmermann, K. Kirstein and A. Hierlemann, “Monolithic CMOS Multi-Transducer Gas Sensor Microsystem for Organic and Inorganic Analytes,” Sensors & Actuators: B. Chemical, Vol. 126, pp. 431-440, 2007.

Gert Cauwenberghs 2008

IEEE Services/Activities:

Program Co-Chair, 20th IEEE Symp. Integrated Circuits and Systems Design (SBCCI'2007, Chip in Rio), Rio de Janeiro, Brazil, Sept. 3-6, 2007.

Senior Associate Editor, IEEE Sensors Journal.

Associate Editor, IEEE Trans. Neural Systems and Rehabilitation Engineering.

Associate Editor, IEEE Transactions on Biomedical Circuits and Systems (as of April 2008).

Invited Talks:

"Micropower Adaptive Vector Processing in Analog VLSI," DARPA Chip-Scale Avionics Workshop, Orlando FL, Feb. 20, 2007.

"Analog VLSI Auditory Separation and Localization," Computation and Neural Systems Seminar, California Institute of Technology, March 19, 2007.

"Adaptive Electronics: A Neuromorphic Perspective," Adaptive Electronics DSRC Workshop, Santa Cruz CA, July 18, 2007.

"Scalability and Efficiency in Neuromorphic Microsystems," DARPA Electronic Cortex Workshop, Arlington VA, July 31, 2007.

"Silicon Learning Machines," IEEE Computational Intelligence Society, San Diego Chapter, Dec. 12, 2007.

"Reconfigurable and Adaptive Mixed-Signal Microsystems," eStemCells DSRC Workshop, Stanford University, Palo Alto CA, March 28, 2008.

Conference and Journal Publications:

"480-GMACS/mW Resonant Adiabatic Mixed-Signal Processor Array for Charge-Based Pattern Recognition," R. Karakiewicz, R. Genov, and G. Cauwenberghs, IEEE J. Solid-State Circuits, vol. 42 (11), pp. 2573-2584, 2007.

"CMOS Camera with In-Pixel Temporal Change Detection and ADC," Y. Chi, U. Mallik, M. Clapp, E. Choi, G. Cauwenberghs and R. Etienne-Cummings, IEEE J. Solid-State Circuits, vol. 42 (10), pp. 2187-2196, 2007.

"Robust Speech Feature Extraction by Growth Transformation in Reproducing Kernel Hilbert Space," S. Chakrabartty, Y. Deng and G. Cauwenberghs, IEEE Trans. Audio, Speech, and Language Processing, vol. 15 (6), pp. 1842-1849, 2007.

"A Multi-Chip Neuromorphic System for Spike-Based Visual Information Processing," R.J. Vogelstein, U. Mallik, E. Culurciello, G. Cauwenberghs and R. Etienne-Cummings, Neural Computation, vol. 19 (9), pp. 2281-2300, 2007.

"Gini-Support Vector Machine: Quadratic Entropy Based Multi-class Probability Regression," S. Chakrabartty and G. Cauwenberghs, J. Machine Learning Research, vol. 8 (4), pp. 813-839, 2007.

"Sub-Microwatt Analog VLSI Trainable Pattern Classifier," S. Chakrabartty and G. Cauwenberghs, IEEE J. Solid-State Circuits, vol. 42 (5), pp. 1169-1179, 2007.

"VLSI Potentiostat Array With Oversampling Gain Modulation for Wide-Range Neurotransmitter Sensing," M. Stanacevic, K. Murari, A. Rege, G. Cauwenberghs and N.V. Thakor, IEEE Trans. Biomedical Circuits and Systems, vol. 1 (1), pp. 63-72, 2007.

"Dynamically Reconfigurable Silicon Array of Spiking Neurons With Conductance-Based Synapses," R.J. Vogelstein, U. Mallik, J.T. Vogelstein and G. Cauwenberghs, IEEE Trans. Neural Networks, vol. 18 (1), pp. 253-265, 2007.

Jennifer Blain Christen 2008

Started a new position as an assistant professor at Arizona State University.

Conference papers

Ultra-High Ratio Dilution Microfluidic System for single strand DNA Isolation, B. Iglehart, P. Pouliquen, J. Blain Christen, ISCAS 2008

Shantanu Chakrabartty 2008

IEEE Services:

Reviewer for IEEE transactions on Circuits and Systems, IEEE Int. Symp. On Circuits and systems, IEEE sensors journal, IEEE transactions on signal processing, IEEE transactions on Neural Networks, IEEE transactions on Biomedical engineering.
Member technical committee for IEEE Neural Network Society and Biomedical circuits and systems (BioCAS) society.

Other professional services:

Technical Program Committee: Symposium on Integrated Circuits and Systems Design, 2007 and 2008.
Associate Editor: Advances in Artificial Neural Systems, Hindawi Publications.

Journal Publications:

Y. Liu, S. Chakrabartty, and E. C.Alocilja, "Fundamental Building Blocks for Molecular Bio-wire based Forward-error Correcting Biosensors", Nanotechnology, 18, (2007), 4240172.
Yang Liu, Amit Gore, Shantanu Chakrabartty, and Evangelyn C.Alocilja, "Characterization of Sub-systems of a Molecular Bio-wire based Biosensor Device," Microchimica Acta , 2008, DOI: 10.1007/s00604-008-0950-0.
V. Venkataramani, S. Chakrabartty , and W. Byrne, Gini-Support Vector Machines for Segmental Minimum Bayes Risk Decoding of Continuous Speech, Computer Speech and Language, Volume 21, Issue 3, July 2007, pp. 423-442.
S. Chakrabartty, Y. Deng and G. Cauwenberghs, Robust Speech Feature Extraction by Growth Transformation in Reproducing Kernel Hilbert Space, IEEE Transactions on Speech, Language and Acoustics, pp. 1842-1849, Vol. 15 Issue: 6, Aug. 2007.
C.Kong and S.Chakrabartty, Analog Iterative Decoders based on Margin Propagation , IEEE Transactions on Circuits and Systems II, pp. 1140-1144, Vol. 54, no. 12, Dec. 2007.

Conference Publications

A. Fazel , S. Chakrabartty, ``Sigma-Delta Learning for Super-Resolution Independent Component Analysis", IEEE International Symposium on Circuits and Systems (ISCAS), Seattle, WA, 2008.
Y. Liu, S. Chakrabartty, E. C.Alocilja, "A Multiplexed Biosensor based on Biomolecular Nanowires," IEEE International Symposium on Circuits and Systems , Seattle, USA, 2008.
Y. Liu, S. Chakrabartty, "Computer Aided Simulation and Verification of Forward Error-Correcting Biosensors," IEEE International Symposium on Circuits and Systems , Seattle, USA, 2008.
N. Lajnef, S. Chakrabartty and N. Elvin, "Calibration and Characterization of Self-powered Floating-gate Sensor Arrays for Long-term Fatigue Monitoring", IEEE Symposium on Circuits and Systems (ISCAS), Seattle WA, May 2008.
A. Fazel , S. Chakrabartty, Sigma-Delta Resolution Enhancement for Far-field Acoustic Source Separation, IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Las Vegas, NV, 2008.
Y. Liu, A. Gore, S. Chakrabartty, E. C.Alocilja, "A Molecular Bio-wire based Multi-array Biosensor with Integrated potentiostats," IEEE Biomedical Circuits and Systems Conference, pp. 29-32, Montral, Canada, Nov.2007.
Y. Liu, S. Chakrabartty, D. S. Gkinosatis, A. K.Mohanty, and N. Lajnef, "Multi-walled Carbon Nanotubes/Poly(L-lactide) Nanocomposite Strain Sensor for Biomechanical Implants," IEEE Biomedical Circuits and Systems Conference, pp. 119-122, Montral, Canada, Nov.2007.
Y. Liu, A. Gore, S. Chakrabartty, E. C.Alocilja, "A Molecular Bio-wire based Multi-array Biosensor with Integrated potentiostats," IEEE Biomedical Circuits and Systems Conference, pp. 29-32, Montral, Canada, Nov.2007. (Invited)

Eugenio Culurciello 2008

Publications:

Journal:

An Integrated Patch-Clamp Potentiostat with Electrode Compensation, P. Weerakoon, K. Klemic, F.J. Sigworth, E. Culurciello, *IEEE Transactions on Biomedical Circuits and Systems TBCAS*, 2008, invited paper.
Integrated patch-clamp biosensor for high-density screening of cell conductance, P. Weerakoon, K. Klemic, F.J. Sigworth, E. Culurciello, *IET Electronics Letters*, January 17th 2008, Vol. 44, Issue 2, pp. 81-82
Three-Dimensional Phototransistors in 3D Silicon-on-insulator technology, Eugenio Culurciello, *IET Electronics Letters*, March 29th 2007, Vol. 43, Issue 7, 29
A Digital Isolation Amplifier in Silicon-on-Sapphire CMOS, E. Culurciello, P.O. Pouliquen, A.G. Andreou, *IET Electronics Letters*, Volume 43, Issue 8, April 12th 2007, pp. 451-452.
Three-Dimensional Photodetectors in 3D Silicon-on-insulator technology, Eugenio Culurciello and Pujitha Weerakoon, *IEEE Electron Device Letters*, Vol. 28, Issue 2, February 2007, pp 117 - 119.

A Multi-Chip Neuromorphic System for Spike-Based Visual Information Processing, R. Jacob Vogelstein, Udayan Mallik, Eugenio Culurciello, Gert Cauwengberghs, Ralph Etienne-Cummings, (NECO-03-06-179R2) *Neural Computation*, Vol. 19, Number 9, September 1 2007

3.2. Conference proceedings

An Integrated Patch-Clamp Amplifier for High-Throughput Planar Patch-Clamp Systems, P. Weerakoon, Kate Klemic, F.J. Sigworth, E. Culurciello, *IEEE International Symposium on Circuits and Systems*, 2008. ISCAS 2008, 18-21 May 2008, Seattle USA., pp. -.

A Low-Power Silicon-on-Sapphire Tunable Ultra-Wideband Transmitter, W. Tang, A.G. Andreou, E. Culurciello, *IEEE International Symposium on Circuits and Systems*, 2008. ISCAS 2008, 18-21 May 2008, Seattle USA., pp. -.

Phototransistor Image Sensor in Silicon on Sapphire, J.H. Park, E. Culurciello, *IEEE International Symposium on Circuits and Syste*ms, 2008. ISCAS 2008, 18-21 May 2008, Seattle USA., pp. -.

High-Speed Back-Illuminated Image Sensor in Silicon-on-Sapphire, J.H Park, E. Culurciello, *IEEE International Symposium on Circuits and Systems, 2008.* ISCAS 2008, 18-21 May 2008, Seattle USA., pp. -.

A 1.2mW CMOS Temporal-Difference Image Sensor for Sensor Networks, Z.M. Fu, E. Culurciello, IEEE *International Symposium on Circuits and Systems*, 2008. ISCAS 2008, 18-21 May 2008, Seattle USA., pp. -.

Fall Detection Using an Address-Event Temporal Contrast Vision Sensor, Z.M. Fu, E. Culurciello, *IEEE International Symposium on Circuits and Systems*, 2008. ISCAS 2008, 18-21 May 2008, Seattle USA., pp. -.

Electrical Noise Analysis of an Integrated Patch-Clamp Amplifier, P. Weerakoon, Kate Klemic, F.J. Sigworth, E. Culurciello, *IEEE BioCAS 2007* conference proceedings, Montreal November 28th

A Low-Noise Miniaturized Patch-Clamp amplifier, P. Weerakoon, Kate Klemic, F.J. Sigworth, E. Culurciello, *IEEE LISA 2007 conference proceedings*, NIH November 8th 2007.

Responsivity of Gated Photodiode in SOS Technology, A. Fish, O. Yadid-Pecht, E. Culurciello, *IEEE Conference on Sensors 2007*, Atlanta, Georgia from Oct 28-31, 2007.

Books:

Silicon on Sapphire Circuit and Systems, in progress, due in September 2008

Tobi Delbruck 2008

Professional Activities

IEEE CAS DLP: Taught at the EAMTA course on Microelectronics in Cordoba Argentina. Lectured in Australia in Sydney, Brisbane, Perth, and Adelaide.

Coorganizer (with Philipp Hafliger) of the ISCAS 2007 and 2008 Special Session on Live Demonstrations of Circuits and Systems

Coorganizer of 2008 Telluride Neuromorphic Engineering Workshop

Associate Editor of IEEE TBioCAS

Journal Reviews for Nature, IEEE Journals TCAS, JSSC, TNN.

Conference Reviews for NIPS, ISCAS, and EAMTA.

Invited talks

05.02.07-, Caltech CNS Department, Building a high-performance event-based silicon retina leads to new ways to compute vision.

12.02.07-, UCSF (UC San Francisco), Building a high-performance event-based silicon retina leads to new ways to compute vision.

13.02.07-, Redwood Center, UC Berkeley, Building a high-performance event-based silicon retina leads to new ways to compute vision.

13.02.07-, MCB 61: Brain, Mind, and Behavior (UC Berkeley, taught by David Presti, 646 students), Silicon retina.

14.02.07-, MCB 165: Molecular Neurobiology and Neurochemistry, taught by David Presti, 174 students, Silicon retina.

02.03.07-, UC San Diego (UCSD), High Performance Asynchronous Temporal Contrast Silicon Retina 13.03.07-, Univ. of Utah, General Biology Seminar, Neuromorphic engineering of the world's highest performance temporal contrast silicon retina.

15.05.07, COGAIN steering board and WP5 meeting, 2007, Initial results for pupil tracking using silicon retina.

10.07.07, Telluride Neuromorphic Workshop 07, Silicon retinas and event-based digital vision.

16.09.07-21.09.07, EAMTA 07 (Escuela Argentina de Microelectrónica, Tecnología y Aplicaciones), Neuromorphic Engineering & Silicon retinas and event-based digital vision.

15.11.07-, Künstliches Sehen: Konvergenz der Mikro-, Informations- und Biotechnologien in der Biomedizintechnik, Neuromorphic retina chips.

21.11.07, XXII Confernce on Design of Integrated Systems (DCIS), Silicon retinas and event-based digital vision.

07.12.07, The 2nd Australian Workshop in Computational Neuroscience, Adelaide, Silicon Retinas and Event-based digital vision.

31.01.08-, Electrical and Computer Engineering Seminar Series, University of Florida, Dynamic silicon retina for event-based digital vision.

06.03.08, Secure Life Symposium, Univ. of Tokyo, Spike-based silicon vision.

10.03.08, Tetsua YAGI Lab, Osaka University, Dynamic digital vision with events.

Awards

Runner up best paper, Sensory Systems TC. **A Spike-Based Saccadic Recognition System**, (2007); Oster, M.; Lichtsteiner, P.; Delbruck, T.; Shih-Chii Liu ISCAS 2007. 27-30 May 2007 Page(s):3083 - 3086.

Journal Publications

A 128×128 120dB 15us Latency Asynchronous Temporal Contrast Vision Sensor. (2007) Lichtsteiner, P., C. Posch and T. Delbruck . *IEEE Journal of Solid State Circuits*, Feb. 2008, 43(2) 566-576.

A Tactile Luminous Floor for an Interactive Autonomous Space (2007).Delbruck, T., A. M. Whatley, R. Douglas, K. Eng, K. Hepp and P. F. M. J. V. Verschure Robotics and Autonomous Systems 55(6):433-443. See Floor pages

A Multi-chip Pulse-based Neuromorphic Infrastructure and its Application to a Model of Orientation Selectivity, (2007) Chicca, E., Whatley, A. M. , Lichtsteiner, P., Dante, V., Delbruck, T., Del Giudice, P., Douglas, R. J., Indiveri, G. *IEEE Transactions on Circuits and Systems I, Regular Papers*, 54:(5) 981-993

Conferences Publications (peer reviewed)

Self-timed vertacolor dichromatic vision sensor for low power face detection, R. Berner, P. Lichtsteiner, T. Delbruck, ISCAS 2008, accepted. In *Special Session on Live Demonstrations of Circuits and Systems*.

Using FPGA for visuo-motor control with a silicon retina and a humanoid robot (2007) Linares-Barranco, A.; Gomez-Rodriguez, F.; Jimenez-Fernandez, A.; Delbruck, T.; Lichtensteiner, P.; , ISCAS 2007, 27-30 May 2007 Page(s):1192 - 1195.

A Spike-Based Saccadic Recognition System, (2007); Oster, M.; Lichtsteiner, P.; Delbruck, T.; Shih-Chii Liu ISCAS 2007. 27-30 May 2007 Page(s):3083 - 3086.
Runner up best paper, Sensory Systems TC.

A 5 Meps $100 USB2.0 Address-Event Monitor-Sequencer Interface. (2007) Berner, R., T. Delbruck, A. Civit-Balcells and A. Linares-Barranco. ISCAS 2007, New Orleans, 27-30 May 2007 Page(s):2451 - 2454.

Fast sensory motor control based on event-based hybrid neuromorphic-procedural system. (2007) T. Delbruck, T. and P. Lichtsteiner, ISCAS 2007, New Orleans, 27-30 May 2007 Page(s):845 - 848.

Dichromatic spectral measurement circuit in vanilla CMOS. (2007) Fasnacht, D. and T. Delbruck. IEEE International Symposium on Circuits and Systems (ISCAS 2007), New Orleans, 27-30 May 2007 Page(s):3091 - 3094.

Dichromatic self-timed spectral measurement circuit with digital output in vanilla CMOS, D. Fasnacht, T. Delbruck, in 2007 IEEE International Image Sensors Workshop (IISW), Ogunquit, Maine.

Invited papers

Frame-free dynamic digital vision , T. Delbruck, Proceedings of Intl. Symposium on Secure-Life Electronics, Advanced Electronics for Quality Life and Society, University of Tokyo, Tokyo, Japan, Mar. 6-7, 2008, pp. 21-26.

Piotr Dudek 2008

IEEE/professional activities

ISCAS Review Committee Member
ECCTD 2007 Track chair for "Gigascale Systems"
Scientific/Technical/Programme Committee Member:
International Joint Conference on Neural Networks (IJCNN/WCCI 2008)
Cellular Neural Networks and their Applications (CNNA 2008)
International Conference on Sensing Technology (ICST 2007)
National Conference on Information Technologies (TI 2007, Poland),
European Conference on Circuit Theory and Design (ECCTD 2007)
Grand Challenges in Microelectronic Design in the UK – coordinator of the “Silicon meets Life” group

Conference Publications:

A.Lopich and P.Dudek, "Implementation of an Asynchronous Cellular Logic Network as a Co-Processor for a General-Purpose Massively Parallel Array", European Conference on Circuit Theory and Design, ECCTD 2007, pp.84-87, Seville, Spain, August 2007

C.Alonso-Montes, P.Dudek, D.L.Vilarino and M.G.Penedo, "On Chip implementation of a Pixel-Parallel Approach for Retinal Vessel Tree Extraction", European Conference on Circuit Theory and Design, ECCTD 2007, pp.511-514, Seville, Spain, August 2007

D.R.W.Barr, P.Dudek, J.Chambers and K.Gurney, “Implementation of Multi-layer Leaky Integrator Networks on a Cellular Processor Array”, International Joint Conference on Neural Networks, IJCNN 2007, Orlando, Florida, August 2007

J.H.B.Wijekoon and P.Dudek, “Spiking and Bursting Firing Patterns of a Compact VLSI Cortical Neuron Circuit”, International Joint Conference on Neural Networks, IJCNN 2007, Orlando, Florida, August 2007

P.Dudek, "Vision Chips with Pixel-Parallel Cellular Processor Arrays", Information Technologies Conference, Gdansk University of Technology Faculty of ETI Annals, No.5, May 2007

D.L.Vilarino and P.Dudek, "Evolution of Pixel Level Snakes Towards an Efficient Hardware Implementation", IEEE International Symposium on Circuits and Systems, ISCAS 2007, pp.2678-2681, May 2007

Journal Publications:

J.H.B.Wijekoon and P.Dudek, "Compact silicon neuron circuit with spiking and bursting behaviour", Neural Networks, Vol 21, Number 2-3, pp 524-534, March/April 2008

Ralph Etienne-Cummings 2008

Professional Activities and Service

Board of Governors, IEEE CAS Society, 2003-2005, 2006 – Present (Re-elected)
Assoc. Director for Education and Outreach, ERC on CISST at Johns Hopkins University, 2004-Present
Organizing Committee of the NSF Telluride Neuromorphic Engineering Workshop, 2003-Present
Director of the Institute of Neuromorphic Engineering, 2002-Present (an Institute "with-out walls")
Journal Formation Committee Member: IEEE CASS, Trans. Biomedical Circuits and Systems, 2005 – 2006
Associated Editor, IEEE Sensors Journal, 2002 – Present
Associated Editor, IEEE Trans. Biomedical Circuits and Systems, 2006 – Present
Strategic Committee: IEEE CASS Board of Governors, 2003 – present
Regional Activities Committee: IEEE CASS Board of Governors, 2003 – present
Member of the Editorial Board: INE The Neuromorphic Engineer, 2002 – present
Member of Program Committee: ISSCC, SPIE, BIS, ISCAS, NIPS, COSI, BioCAS
Reviewer: IEEE SJ, IEEE TCAS II, IEEE TNN, IEEE TR, IEEE TBME, IEEE IJSSC, IJCV, NIPS, EWNS, ISCAS, Wiley, NSF, NIH

Honors

Science Spectrum Trailblazer Award for Top Minorities in Science, 2006
Fulbright Fellowship Award to South Africa, 2006/2007
Visiting African Fellowship Award, *University of Cape Town*, 2006/2007
Diversity Leadership Council Diversity Award, *JHU* 2006

Journal Publications:

J. Vogelstein, F. Tenore, R. Etienne-Cummings, M. A. Lewis, N. Thakor and A. Cohen, "Control of Locomotion After Injury or Amputation," *Biological Cybernetics*, Vol. 95, No. 6, pp. 555 – 566, December 2006. (IF 2.14)

J. Volgelstein, U. Mallick, G. Cauwenberghs and R. Etienne-Cummings, "Real-Time Image Processing using a Spiking Imager and an Integrate-and-Fire Array Transceiver System," accepted to *Neural Computation*, Fall 2006. (IF 2.36)

J. Vogelstein, R. Etienne-Cummings, N. Thakor and A. Cohen, "Phase-Dependent Effects of Stimulation of the Spinal Central Pattern Generator for Locomotion," *IEEE Trans. Neural Systems and Rehabilitation Engineering*, Vol. 14, No. 3, pp. 257 – 265, September 2006. (IF 1.27)

N. Ekekwe and R. Etienne-Cummings, "Power Dissipation Sources and Possible Control Techniques in Ultra Deep Submicron CMOS Technologies," *Elsevier Journal of Microelectronics*, Vol. 37, No. 9, pp. 851-860 September 2006 (IF 0.48)

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)

S. Mehta and R. Etienne-Cummings, "A Simplified Normal Optical Flow CMOS Camera," *IEEE Trans. Circuits and Systems-I*, Vol. 53, No. 6, pp. 1223 – 1234, June 2006 (IF 0.93)

Conference Publications:

Y. Chi, T. Tran and and R. Etienne-Cummings, "Optical Flow Approximation of Sub-Pixel Accurate Block Matching for Video Coding" accepted to *IEEE ICASSP 2007*, Honolulu, HW, April 2007.

R. Philipp and R. Etienne-Cummings, "A Single Chip Stereo Imager" *ISSCC'06 Digest of Technical Papers*, Vol. 49, Feb 2006.

S. Acharya, V. Aggarwal, F. Tenore, H.C. Shin, R. Etienne-Cummings, M.H. Schieber, N.V. Thakor, "Towards a Brain-Computer Interface for Dexterous Control of a Multi-Fingered Prosthetic Hand," Submitted to *IEEE EMBS NeuroEngineering*, Honolulu, HI, USA, Summer 2007.

J. Tapson and R. Etienne-Cummings, "A Simple Neural Cross-Correlator Engine," accepted to *IEEE ISCAS 2007*, New Orleans, LA, May 2007.

N. Ekekwe, P. Kazanzides and R. Etienne-Cummings, "Incremental Encoder Based Position and Velocity Measurements VLSI Chip with Serial Peripheral Interface," accepted to *IEEE ISCAS 2007*, New Orleans, LA, May 2007.

C. Clark, C. White and R. Etienne-Cummings, "Design and Optimization a Capacitive Micromachined Ultrasonic Transducer Micro-Array for Near Field Sensing ," accepted to *IEEE ISCAS 2007*, New Orleans, LA, May 2007.

V. Gruev, Z. Yang, J. van der Spiegel and R. Etienne-Cummings, "2 Transistor, Current-Mode Active Pixel Sensor," accepted to *IEEE ISCAS 2007*, New Orleans, LA, May 2007.

A. Russell, G. Orchard and R. Etienne-Cummings, "Configuring Spiking Central Pattern Generator Networks with Genetic Algorithms," accepted to *IEEE ISCAS 2007*, New Orleans, LA, May 2007.
R. Etienne-Cummings, V. Gruev, S. Mehta and R. Philipp, "Neuromorphic Vision Systems for Mobile Applications," *IEEE CICC 2006*, San Jose, CA, September 2006 (Invited)
R. Philipp and R. Etienne-Cummings, "Second Generation Single-Chip Imager," *IEEE ISCAS 2006*, Kos, Greece, May 2006.
N. Ekekwe, R. Etienne-Cummings and Peter Kazanzides, "Modeling and simulation of a VLSI chip for adaptive speed control of brushed DC motors", *IASTED International Conference on Control and Applications*, Montreal, Canada, May 2006.
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," *IEEE ISCAS 2006*, Kos, Greece, May 2006.
M. Chi, U. Mallik, E. Choi, M. Clapp, G. Cauwenberghs and R. Etienne-Cummings, "CMOS Pixel-Level ADC with Change Detection," *IEEE ISCAS 2006*, Kos, Greece, May 2006.
N. Ekekwe, R. Etienne-Cummings and P. Kazanzides, "A Configurable VLSI Chip for DC Motor Control for Compact, Low-Current Robotic Systems," *IEEE ISCAS 2006*, Kos, Greece, May 2006.
J. Vogelstein, R. Etienne-Cummings and A. Cohen, "Dynamic Control of Spinal Locomotion Circuits," *IEEE ISCAS 2006*, Kos, Greece, May 2006.
S. Mehta and R. Etienne-Cummings, "Normal Flow Measurement Visual Motion Sensor" *IEEE ISCAS 2006*, Kos, Greece, May 2006.
V. Gruev,R. Philipp and R. Etienne-Cummings, "General Image Processing Chip in 3D Integration," *IEEE ISCAS 2006*, Kos, Greece, May 2006.
R. Etienne-Cummings, Swati Mehta, R. Philipp and V. Gruev, "Neuromorphic Vision Systems for Mobile Applications," *IEEE CICC'06*, San Jose, CA, September 2006.
R. Etienne-Cummings and J. Tapson, "Wireless Address Event Representation System For Biological Sensor Network," accepted to *Proc. SPIE (Bioengineered and Bioinspired Systems)*, May 2007
C. Clark, J. Whitney and R. Etienne-Cummings, "Design of an Ultrasonic Micro-Array for Near Field Sensing during Retinal Microsurgery," *Proc. EMBS*, New York, NY, August 2006.

Patents:

R. Etienne-Cummings and M. A. Lewis, "A Biomorphic Rhythmic Movement Controller," Patent #7164967, September 2006.

Workshops/Conferences/Panels/Invited Talks:

Session Chairman: International Symposium on Circuits and Systems, 2001-2006
Program Co-Chair: IEEE BioCAS Conference, Montreal, Fall 2007
Invited Speaker: Yale University, CT, 2006.
Invited Speaker: University of Alberta, Canada, 2006.
Invited Speaker: IEEE CICC '06, Signal and Data Processing, San Jose, CA, 2006.
Invited Speaker: University of Cape Town, IEEE Chapter, 2006.
Organizer: NSF Telluride Neuromorphic Engineering Workshop, Telluride, CO, 2003-2006.
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.

Alex Fish 2008

IEEE Services:

Co-organizer of Special Session "Low Power Smart CMOS Image Sensors and Beyond", IEEE International Symposium on Circuits and Systems, Seattle, USA, May, 2008
Co-organizer of a Special Session on "Smart" CMOS Image Sensors, IEEE Sensors Conference, Atlanta, USA, October, 2007
Other professional activities
Reviewer for the IEEE Sensors Journal
Reviewer for the IEEE Transactions on Circuits and Systems I Journal
Reviewer for the IEEE Transactions on Electron Devices Journal
Reviewer for the IEEE Transactions on VLSI Journal
Reviewer for the IEEE International Symposium on Circuits and Systems (ISCAS)
Reviewer for the IEEE International Conference on Electronics, Circuits and Systems (ICECS)
Reviewer for IEEE International Midwest Symposium on Circuits and Systems
Reviewer for the IEEE Sensors Conference

Publications:

Journal manuscripts

Belenky, A. Fish and O. Yadid-Pecht, “Global Shutter CMOS Image Sensor with Wide Dynamic Range”, IEEE Transactions on Circuits and Systems II: Express briefs, vol 54, no.12, December 2007.

Y. Shoshan, A. Fish, X. Li, G. A. Jullien and O. Yadid-Pecht, "VLSI Watermark Implementations and Applications", to be appear in International Journal on Information Technologies and Knowledge, vol. 2, 2008.

Conference proceedings

Fish, T. Rothschild, A. Hodes, Y. Shoshan and O. Yadid-Pecht, “Low Power CMOS Image Sensors Employing Adaptive Bulk Biasing Control (AB2C) Approach”, Proc. IEEE International Symposium on Circuits and Systems, pp. 2834-2837, New-Orleans, USA, May 2007.

Fish, O. Yadid-Pecht and E. Culurciello, "Responsivity of Gated Photodiode in Silicon-on-Sapphire Technology", Proc. IEEE Sensors conference, Atlanta, USA, October, 2007.

Teman, S. Fisher, L. Sudakov, A. Fish and O. Yadid-Pecht, "Autonomous CMOS Image Sensor for Real Time Targets Detection and Tracking", Proc. IEEE International Symposium on Circuits and Systems, Seattle, USA, May 2008.

M. Beiderman, T. Tam, A. Fish, G. A. Jullien and O. Yadid-Pecht, “A Low Noise CMOS Image Sensor with an Emission Filter for Fluorescence Applications”, Proc. IEEE International Symposium on Circuits and Systems, Seattle, USA, May 2008.

Fish and O. Yadid-Pecht, “Low Power “Smart” CMOS Image Sensors”, Proc. IEEE International Symposium on Circuits and Systems, Seattle, USA, May 2008.

Maysam Ghovanloo 2008

IEEE Services

Technical Review Committee, IEEE Intl. Symp. on Circuits and Systems, New Orleans, LA, May 2007.

Special Session Co-Organizer, Neuroengineering Circuits and Microsystems, IEEE Intl. Symp. on Circuits and Systems, New Orleans, LA, May 2007.

Session Co-Chair: BioMEMS, IEEE Intl. Symp. on Circuits and Systems, New Orleans, LA, May 2007.

Technical Program Committee, Bioengineering, IEEE Midwest Symp. on Circuits and Systems, Montreal, Canada, August 2007.

Technical Program Committee, IEEE Biomedical Circuits and Systems conference, Montreal, Canada, November 2007.

Special Session Organizer, Modern Assistive Technologies, IEEE Engineering in Medicine and Biology Conference, Lyon, France, August 2007.

Martin Haenggi 2008

Professional Activities and Service

Associate Editor, Elsevier Journal of Ad Hoc Networks, 2005 – Present

Member of the Technical Committee on Ad Hoc and Sensor Networks, IEEE Communication Society

Member of Program Committee: GLOBECOM, ICC, ITA, WCNC, InterPerf, ConCom

Reviewer: IEEE IT, IEEE SP, IEEE JSAC, IEEE TVT, IEEE TWT, ISCAS, GLOBECOM, ICC, WCNC, NSF

Publications

Invited papers

R. K. Ganti and M. Haenggi, “Dynamic Connectivity and Packet Propagation in ALOHA Networks,” in 2007 Asilomar Conference on Signals, Systems, and Computers, (Pacific Grove, CA), Nov. 2007.

Journal Publications

J. G. Andrews, S. Weber, and M. Haenggi, “Ad Hoc Networks: To Spread or not to Spread?,” IEEE Communications Magazine, vol. 45, pp. 84–91, Dec. 2007.

M. Xie and M. Haenggi, “A Study of the Correlations between Channel and Traffic Statistics in Multihop Networks,” IEEE Transactions on Vehicular Technology, vol. 56, pp. 3550–3562, Nov. 2007.

Conference Publications:

D. Puccinelli and M. Haenggi, “Arbutus: Network-Layer Load Balancing for Wireless Sensor Networks,” in 2008 IEEE Wireless Communications and Networking Conference (WCNC’08), (Las Vegas, NV), March 2008.

M. Xie, M. Haenggi, and K.-K. Wong, "On the End-to-End Delay Performance of Spatially Correlated Wireless Line Networks," in 2008 IEEE International Conference on Communications (ICC'08), (Beijing, China), May 2008.
D. Puccinelli and M. Haenggi, "DUCHY: Double Cost Field Hybrid Link Estimation for Low-Power Wireless Sensor Networks," in The Fifth Workshop on Embedded Networked Sensors (EmNets'08), (Charlottesville, VA), June 2008.
S. Srinivasa and M. Haenggi, "Modeling Interference in Finite Uniformly Random Networks," in International Workshop on Information Theory for Sensor Networks (WITS 2007), (Santa Fe, NM), June 2007.

Patents:

D. Chen, M. Haenggi, and J. N. Laneman, "System and Method for Distributed Spectrum-Efficient Routing Algorithms in Wireless Networks"

Workshops/Conferences/Panels/Invited Talks:

Conference Tutorials: International Symposium on Circuits and Systems, 2007; International Conference on Information Technology Convergence, Jeonju, South Korea, Nov. 2007.
Poster Chair: 2008 IEEE Communication Theory Workshop, St. Croix, US Virgin Islands
Invited Speaker: Pisa Program on Stochastic Networks; Zurich Seminar; Information Theory and its Applications (San Diego); 2008 Communications Theory Workshop; USC

Philipp Häfliger 2008

IEEE Services/Activities:

Co-organizer 'Invited session on live demonstrations of circuits and systems' ISCAS 2007 and 2008
Technical Program Committee BioCAS 2007
Secretary BioCAS Technical Committee of the CAS

Publications:

Conference Publications:

Two Color Asynchronous Event Photo Pixel, J. M. A. Olsson and P. Häfliger, ISCAS 2008, Seattle, USA accepted for publication
High-Speed Serial AER on FPGA, H. K. O. Berge and P. Häfliger, ISCAS 2007, New Orleans, USA

Journal Publications:

A gate leakage feedback element in an adaptive amplifier application, H. K. O. Berge and P. Häfliger, IEEE Transactions on Circuits and Systems II, 2008, vol. 55 (2), p 101-105
Adaptive WTA with an analog VLSI neuromorphic learning chip, P. Häfliger, IEEE Transactions on Neural Networks, 2007, vol. 18 (2), p 551-572
Exploiting Gate Leakage in Sub-Micrometer CMOS for Input Offset Adaptation, P. Häfliger and H. K. O. Berge, IEEE Transactions on Circuits and Systems II, 2007, vol. 54 (2), p 127-130, IEEE Xplore pdf.

Giacomo Indiveri 2008

Services:

Program Committee Member of the:
2008 Computational Intelligence in Security for Information Systems CISIS'08
2008 Bio-Sensing (OP207) Part of the SPIE International Symposium on NanoScience + Engineering
2007 International Symposium on Neural Networks
2007 and 2005 SPIE Microtechnologies for the new Millennium conference.
Review committee member of the:
2008 IEEE International Symposium on Circuits and Systems (ISCAS)
2008 Neural Information Processing Systems (NIPS) conference
2008 International Federation of Automatic Control (IFAC) World Congress
2008 IEEE World Congress on Computational Intelligence (WCCI 2008)
Chair of the:
2007 Neural Information Processing Systems (NIPS) demo session
2007 IEEE Neural systems and applications technical committee
Editorial Services:

2007-2008 Associate Editor of IEEE TNN

Publications:

Book Chapters

G. Indiveri, S.-C. Liu, T. Delbrück, and R. Douglas. New Encyclopedia of Neuroscience, chapter Neuromorphic Systems. Elsevier, 2007.

G. Indiveri and R. Douglas. “Handbook on Nano- and Molecular Electronics”, chapter Neuromorphic Networks of Spiking Neurons, pages 10–1–10–9. CRC Press, 2007.

Journals:

G. Indiveri. “Synaptic plasticity and spike-based computation in VLSI networks of integrate-and-fire neurons”. Neural Information Processing - Letters and Reviews, 11(4–61):135–146, 2007.

[4] C. Bartolozzi and G. Indiveri. “Synaptic dynamics in analog VLSI. Neural Computation”, 19(10):2581–2603, Oct 2007.

[5] E. Chicca, A. M. Whatley, V. Dante, P. Lichtsteiner, T. Delbrück, P. Del Giudice, R. J. Douglas, and G. Indiveri. “A multi-chip pulse-based neuromorphic infrastructure and its application to a model of orientation selectivity”. IEEE Transactions on Circuits and Systems I, Regular Papers, 5(54):981–993, 2007.

Conferences:

D.B. Fasnacht, A. Whatley, and G Indiveri. “A serial communication infrastructure for multi-chip address event system”. In IEEE International Symposium on Circuits and Systems,

ISCAS 2008. IEEE, 2008. (In Press).

E. Neftci, E. Chicca, G. Indiveri, J.-J. Slotine, and R. J. Douglas. “Contraction properties of VLSI cooperative competitive neural networks of spiking neurons”. In B. Schölkopf, J. Platt, and T. Hoffman, editors, Advances in Neural Information Processing Systems, Cambridge (MA), 2008. MIT Press.

S. Mitra, G. Indiveri, and S. Fusi. “Learning to classify complex patterns using a VLSI network of spiking neurons”. In B. Schölkopf, J. Platt, and T. Hoffman, editors, Advances in Neural Information Processing Systems, Cambridge (MA), 2007. MIT Press.

S. Mitra, G. Indiveri, and S. Fusi. “Robust classification of correlated patterns with a neuromorphic VLSI network of spiking neurons”. In IEEE, editor, IEEE Proceedings on Biomedical Circuits and Systems (Bio-CAS07), pages 87–90, 2007.

H-P Wang, E. Chicca, G. Indiveri, and T.J. Sejnowski. “Reliable computation in noisy backgrounds using real-time neuromorphic hardware”. In IEEE, editor, IEEE Proceedings on Biomedical Circuits and Systems (BioCAS07), pages 71–74, 2007.

P. Camilleri, M. Giulioni, V. Dante, D. Badoni, G. Indiveri, B. Michaelis, J. Braun, and P. Del Giudice. “A neuromorphic aVLSI network chip with configurable plastic synapses”. In Proceedings of the 7th International Conference on Hybrid Intelligent Systems (HIS’07), pages 296–301, Los Alamitos, CA, USA, 2007. IEEE Computer Society. (Best paper award).

[12] G. Indiveri and S. Fusi. “Spike-based learning in VLSI networks of integrate-and-fire neurons”. In Proc. IEEE International Symposium on Circuits and Systems, ISCAS 2007, pages 3371–3374, 2007.

Shih-Chii Liu 2008

Chairman of IEEE Sensory Systems Technical Committee
Co-chair of ISCAS Sensory Systems Track 2007
Co-chair of IEEE Biomedical Circuits and Systems Conference Technical Program 2008
Secretary of IEEE Neural Systems and Applications Technical Committee
Editorial Board member of Neuromorphic Engineering newsletter

Publications:

Journal Papers:

Chan, V., Liu, S-C., and van Schaik, A. (2007), “AER EAR: A matched silicon cochlea pair with address event representation interface, “*IEEE Transactions on Circuits and Systems I-Special Issue on Smart Sensors*, vol. 54, no. 1, pp 48-59, 2007.

Conference Papers:

Gomez-Rodriguez, F., Linares-Barranco, A., Miro, L., Liu, S-C., van Schaik, A., Etienne-Cummings, R., and Lewis, M. A. (2007), “AER audition filtering and CPG for robot control,” 2007 IEEE International Symposium on Circuits and Systems, pp.1201--1204, May 27--30, New Orleans, USA.

Oster, M., Douglas, R., and Liu, S-C. (2007), “Quantifying input and output statistics of a winner-take-all network in a vision system,” *2007 IEEE International Symposium on Circuits and Systems, Special Session on Spiking Processing Based Hardware Vision Systems*, pp.853--856, May 27--30, New Orleans, USA.

Moeckel, R. and Liu, S-C. (2007), “Motion detection circuits for a time-to-travel algorithm,”*2007 IEEE International Symposium on Circuits and Systems*, pp.3079--3082, May 27--30, New Orleans, USA.

Oster, M., Lichtsteiner, P., Delbruck, T., and Liu, S-C. (2007), "A spike-based saccadic recognition system,"*2007 IEEE International Symposium on Circuits and Systems*, pp.3083--3086, May 27--30, New Orleans, USA.
Wang, X., Douglas, R., and Liu, S-C. (2007), "Attentional processing in a spike-based VLSI neural network, "*Advances in Neural Information Processing Systems*, Volume 19, Vancouver, Canada, MIT Press, 2007.

Dimitrios Loizos 2008

Professional Activities and Service

- Post-Doctoral Fellow, University of California – San Diego, 2007 – 2008
- Design Engineer, NetLogic Microsystems, Inc., 2008 – Present
- Visiting Scholar, University of California – San Diego, 2008 – Present
- Member of the Technical Chamber of Greece, 2003 – Present
- IEEE Member
- Member of Technical Committee: ASPTC, SSTC
- Reviewer: IEEE TCAS I, IEEE TCAS II, ISCAS, GLSVLSI

Awards

- **Best paper award in IEEE Symp. on Integrated Circuits and Systems Design (SBCCI).** **High-Speed, Model-Free Adaptive Control using Parallel Synchronous Detection**, (2007); Loizos, D.; Sotiriadis, P.; Cauwenberghs, G., SBCCI 2007. 3-6 September 2007 Page(s): 224 – 229.
- **3rd place for best student paper award in IEEE Int. Symp. on Circuits and Systems (ISCAS) '07.** **Multi-Channel Coherent Detection for Delay-Insensitive Model-Free Adaptive Control**, (2007); Loizos, D.; Sotiriadis, P.; Cauwenberghs, G., ISCAS 2007. 27-30 May 2007 Page(s): 1775 – 1778.

Publications

Invited papers

- **A Translinear SiGe BiCMOS Current-Controlled Oscillator with 80Hz-800MHz Tuning Range** (2008). Loizos, D.; Sotiriadis, P.; Cauwenberghs, G., *J. of Analog Integrated Circuits and Signal Processing*, to appear.

Journal Publications

- **Fast State-Space Harmonic-Distortion Estimation in Weakly Nonlinear G_m–C Filters** (2007). Sotiriadis, P., Celik, A., Loizos, D., Zhang Z., *IEEE Trans. on Circuits and Systems—I*, 54(1): 218-228.
- **BiCMOS Multi-Channel Synchronous Detection for sub-µs Adaptive Control** (2008). Loizos, D.; Sotiriadis, P.; Cauwenberghs, G., *IEEE J. on Solid-State Circuits*, submitted.

Conference Publications:

- **Adaptive Delay Compensation in Multi-Dithering Adaptive Control** (2008) Loizos, D.; Sotiriadis, P.; Cauwenberghs, G.; ISCAS 2008, 18-21 May 2008.
- **A 7-decades Tunable Translinear SiGe BiCMOS 3-phase Sinusoidal Oscillator** (2008) Loizos, D.; Sotiriadis, P.; Cauwenberghs, G.; ISCAS 2008, 18-21 May 2008.
- **High-Speed Adaptive RF Phased Array** (2008) Loizos, D.; Sotiriadis, P.; Cauwenberghs, G.; ISCAS 2008, 18-21 May 2008.
- **High-Speed, Model-Free Adaptive Control using Parallel Synchronous Detection** (2007); Loizos, D.; Sotiriadis, P.; Cauwenberghs, G., SBCCI 2007. 3-6 September 2007 Page(s): 224 – 229.
- **Integrated Multi-Dithering Control for Adaptive Atmospheric Turbulence Compensation** (2007); Loizos, D., Liu, L., Sotiriadis, P., Cauwenberghs, G., Vorontsov, M., *SPIE Optics and Photonics 2007*, 26-30 August 2007, 6708: 67080B-1 – 67080B-10.
- **Coherent Combining of Multiple Beams with Multi-Dithering Technique: 100 kHz Closed-Loop Compensation Demonstration Compensation** (2007); Liu, L., Loizos, D., Sotiriadis, P., Vorontsov, M., Cauwenberghs, G., *SPIE Optics and Photonics 2007*, 26-30 August 2007, 6708: 67080D-1 – 67080D-9.
- **Multi-Channel Coherent Detection for Delay-Insensitive Model-Free Adaptive Control**, (2007); Loizos, D.; Sotiriadis, P.; Cauwenberghs, G., ISCAS 2007. 27-30 May 2007 Page(s): 1775 – 1778.

Workshops/Conferences/Panels/Invited Talks:

- Session Chairman: International Symposium on Circuits and Systems, 2008.
- Invited Speaker: NIST (National Instute of Standards and Technology), MD, 2007.

Andrew Mason 2008

Other Services:

National Institutes of Health, Electromagnetic Devices Special Study Session, September 2007.

Publications:

Journal Publications:

A. Mason, A. V. Chavan, K. D. Wise, “A Mixed-Voltage Sensor Readout Circuit with On-Chip Calibration and Built-In Self-Test,” IEEE Sensors J, vol. 7, no. 9, pp. 1225-1232, September 2007.

A. Kamboh, M. Raetz, K. Oweiss, A. Mason “Area-Power Efficient VLSI Implementation of Multichannel DWT for Data Compression in Implantable Neuroprosthetics,” IEEE Trans. Biomedical Circ. Systems, vol. 1, no. 2, pp. 128-135, June 2007.

K. Oweiss, A. Mason, Y. Suhail, A. Kamboh, K. Thomson, “A Scalable Wavelet Transform VLSI Architecture for Real-Time Signal Processing in High-Density Intra-Cortical Implants,” IEEE Trans. Circuits and Systems I, vol. 54, no. 6, pp. 1266-1278, June 2007.

Conference Proceedings:

C. Yang, D. Rairigh and A. Mason, “Fully Integrated Impedance Spectroscopy for Biochemical Sensor Arrays,” IEEE Biomedical Circuits and Systems Conference, Montreal Canada, pp. 21-24, November 2007.

D. Rairigh and A. Mason, “Compact Impedance Spectroscopy for High Density Sensor Arrays,” IEEJ Int. Analog VLSI Workshop, Bunratty Ireland, November 2007.

M. A. Shetliffe, A. M. Kamboh, A. Mason, K. G. Oweiss, “Impact of Real Time Hardware Processing on Neural Spike Train Information Content,“ Int. Conf. IEEE Engineering in Medicine and Biology Society, Lyon, France, pp. 5358-5361, August 2007.

A. Mason, Y. Huang, C. Yang, J. Zhang, “Amperometric Readout and Electrode Array Chip for Bioelectrochemical Sensors,” IEEE Int. Symposium on Circ. and Systems (ISCAS), pp. 3562-3565, May 2007.

A. Kamboh, M. Raetz, A. Mason and K. Oweiss “Area-Power Efficient Lifting-Based DWT Hardware for Implantable Neuroprosthetics,” IEEE Int. Symposium on Circ. and Systems (ISCAS), pp. 2371-2374, May 2007.

C. Yang and A. Mason, “Precise RSSI with High Process Variation Tolerance,” IEEE Int. Symp. Circuits and Systems, pp. 2870-2873, May 2007.

A. Kamboh, A. Mason and K. Oweiss “A High-Yield Area-Power Efficient DWT Hardware for Implantable Neural Interface Applications,” IEEE/EMBS Int. Conf. Neural Engineering, Hawaii, USA, pp. 212-216, May 2007.

Christoph Posch 2008

Honors

Principal Scientist - ARC (2007)

Awards

Best Paper Award ICECS 2007, "**A Two-Stage Capacitive-Feedback Differencing Amplifier for Temporal Contrast IR Sensors**", C. Posch, D. Matolin, R. Wohlgenannt, Electronics, Circuits and Systems, 2007. ICECS '07. 14th IEEE International Conference on, pp. 1071-1074, Dec. 11-14, 2007 (2007).

Publications

Journal Publications

Lichtsteiner, P.; Posch, C.; Delbruck, T., "**A 128×128 120dB 15us Latency Asynchronous Temporal Contrast Vision Sensor**", *Solid-State Circuits, IEEE Journal of* , vol.43, no.2, pp.566-576, Feb. 2008

D. Bauer, A.N. Belbachir, N. Donath, G. Gritsch, B. Kohn, M. Litzenberger, C. Posch, P. Schön, and S. Schraml, "**Embedded Vehicle Speed Estimation System Using an Asynchronous Temporal Contrast Vision Sensor**", *EURASIP Journal on Embedded Systems*, Article ID 82174, 12 p., Volume 2007, doi:10.1155/2007/82174, 2007

Conference Publications:

C. Posch, D. Matolin, R. Wohlgenannt, "**An Asynchronous Time-based Image Sensor**", *Circuits and Systems, 2008. ISCAS '08. IEEE International Conference on*, May 18-21, 2008

C. Posch, D. Matolin, R. Wohlgenannt, "**A 64×64 Pixel Temporal Contrast Microbolometer Infrared Sensor**", *Circuits and Systems, 2008. ISCAS '08. IEEE International Conference on*, May 18-21, 2008

C. Posch, D. Matolin, R. Wohlgenannt, "**A Two-Stage Capacitive-Feedback Differencing Amplifier for Temporal Contrast IR Sensors**", *Electronics, Circuits and Systems, 2007. ICECS '07. 14th IEEE International Conference on*, pp. 1071-1074, Dec. 11-14, 2007

Litzenberger, M.; Kohn, B.; Gritsch, G.; Donath, N.; Posch, C.; Belbachir, N.A.; Garn, H., "**Vehicle Counting with an Embedded Traffic Data System using an Optical Transient Sensor**", *Intelligent Transportation Systems Conference*, 2007. ITSC 2007. IEEE , vol., no., pp.36-40, Sept. 30 2007-Oct. 3 2007

M. Litzenberger, A.N. Belbachir, P.Schön and C.Posch, "**Embedded Smart Camera for High-Speed Vision**", *ACM/IEEE International Conference on Distributed Smart Cameras*, ICDSC 2007. Proceedings, Sept. 25-28, 2007

A. N. Belbachir, M. Litzenberger, C. Posch, P. Schön, "**Real-Time Vision Using a Smart Sensor System**", *Industrial Electronics, 2007 IEEE International Symposium on*, June 4-7, 2007

C. Posch, M. Hofstätter, M. Litzenberger, D. Matolin, N. Donath, P. Schön, H. Garn, "**Wide dynamic range, high-speed machine vision with a 2×256 pixel temporal contrast vision sensor**," *Circuits and Systems,. ISCAS 2007. IEEE International Symposium on*, May 29-31, 2007

Posch, C.; Hofstätter, M.; Matolin, D.; Vanstraelen, G.; Schön, P.; Donath, N.; Litzenberger, M., "**A dual-line optical transient sensor with on-chip precision time-stamp generation**," *Solid-State Circuits, 2007 IEEE International Conference ISSCC*, Digest of Technical Papers, pp. 500-501, Feb. 11-15, 2007.

Patents:

AT 502.032 B1, "VERFAHREN ZUR AUSWERTUNG VON SZENEN UND SENSOR- BZW. AUFNAHMEELEMENT", WO 2006/125233 A1, January 15, 2007.

Khaled Salama 2008

IEEE Services/Activities:

TPC: ICM 2007, ACM Great Lakes symposium 2007
Session chair: BioCAS 2007, ICM 2007, ISCAS 2008
organizing committee: co-chair Tutorials committee BioCAS 2008
ISCAS 2007: Tutorial presentor, Session Chair

Publications:

S. Mondal, S.K. Gowda, T. Zhang and K.N. Salama, " Novel PSK enumeration for efficient VLSI implementation of MIMO detection," Midwest symposium on circuits and systems, ,2007
A.S. Elwakil and K.N. Salama, 'Improvement to the Condition for Oscillation of Cross-Coupled Sinusoidal Oscillators," International Symposium on Nonlinear Theory and its Applications, pp. 7-10, 2007
D. Veskler, A. Muariev, T. Elkhatib, K.N. Salama. M. S. Shur, " Plasma wave FET for sub-wavelength THz imaging," International Semiconductor Device Research Symposium (ISDRS) , 2007
S. Mondal, W. Ali and K. Salama, 'A Novel Approach for K-Best MIMO Detection and its VLSI Implementation', ISCAS, 2008
T. Elkhatib, Z. Huang and KN Salama, 'Real Time Optofluidic Microscopy ,' IEEE NEWCAS, Montreal, June, 2008 [accepted to be published]
T. Elkhatib, Z. Huang and KN Salama, 'Simulation and Verification of Real Time Optofluidic Microscopy ', SPIE Conference on Optics and Photonics, San Diego, August, 2008 [accepted to be published]
AS Elwakil and KN Salama, 'On the non linear modeling of ring oscillators ', NEWCAS, Montreal, June, 2008 [accepted to be published]
S. Yao and KN Salama, 'High Dynamic Range Adaptive ?S Based Focal Plane Array Architecture ', SPIE Conference on Optics and Photonics, San Diego, August, 2008 [accepted to be published]

André van Schaik 2008

Service

Past Chair IEEE CAS Sensory Systems TC
Member, IEEE CAS Technical Committees: Analogue Signal Processing, Biomedical Circuits and Systems, Neural Systems and Applications Co-chair, Sensory Systems Track IEEE ISCAS08 AE IEEE TCAS I Board Member, Institute of Neuromorphic Engineering Organizer, Telluride Neuromorphic Engineering Workshop Member EPSRC peer review college

Publications:

Journal papers:

R. Reeve, A. van Schaik, C. Jin, T. Hamilton, B. Torben-Nielsen and B. Webb, “Directional hearing in a silicon cricket,” *Biosystems*, Volume 87, Issues 2-3, 2007, pp 307-313.

V. Chan, S. Liu, and A. van Schaik, “AER EAR: A Matched Silicon Cochlea Pair with Address Event Representation Interface,” *IEEE Transactions on Circuits and Systems I*, Vol 54, No 1, pp 48-59, 2007

V. Chan, C. Jin, and A. van Schaik, "An Address-Event Vision Sensor for Multiple Transient Object Detection," IEEE Transactions on Biomedical Circuits and Systems, Vol 1, No 4, pp 278-288, 2007.

Conference papers:

T. Hamilton, J. Tapson, C. Jin, and A. van Schaik, "A basilar membrane resonator for an active 2-D cochlea," Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS 2007), May 2007, New Orleans, USA, pp 2387-2390.

F. Gomez-Rodriguez, A. Linares-Barranco, L. Miro, S.-C. Liu, A. van Schaik, R. Etienne-Cummings, and M. A. Lewis, "AER auditory filtering and CPG for robot control," Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS 2007), May 2007, New Orleans, USA, pp 1201-1204.

T. Hamilton, C. Jin, J. Tapson, and A. van Schaik, "A 2-D Cochlea with Hopf Oscillators," Proceedings of the IEEE Biomedical Circuits and Systems Conference, November 2007, Montreal, Canada, pp 91-94.

J. Tapson, C. Jin, and A. van Schaik, "A Scalable Architecture for Event-Based Cross -Correlation," Proceedings of the IEEE Biomedical Circuits and Systems Conference, November 2007, Montreal, Canada, pp 83-86.

A. McEwan, J. Tapson, A. van Schaik and D.S. Holder, "Electrode Circuits for Frequency- and Code-Division Multiplexed Impedance Tomography, Proceedings of the IEEE Biomedical Circuits and Systems Conference, November 2007, Montreal, Canada, pp 130-133.

A. McEwan, J. Tapson, A. van Schaik and D.S. Holder, "Wide-Bandwidth, High Frame Rate Electrical Impedance Tomography / Spectroscopy: A Code Division Multiplexing (CDM) Approach," International Conference on Biomedical Electronics and Devices (BioDevices), January 2008, Funchal, Portugal.

Patents:

S. Carlile, C. Jin, J. Leung, and A. van Schaik, "Sound enhancement for hearing-impaired listeners," United States Patent US2007127748, June 7, 2007

C. Jin, P. Leong, J. Leung, S. Carlile, and A. van Schaik, "Generation Of Customised Three Dimensional Sound Effects For Individuals," United States Patent US2007183603, August 9, 2007

Teresa Serrano Gotarredona 2008

Conference Publications:

R. Serrano-Gotarredona, T. Serrano-Gotarredona, A. J. Acosta-Jimenez, A Linares-Barranco, G. Jimenez-Moreno, A. Civit-Balcells and Bernabé Linares-Barranco,”Spike-Events Processing for Vision Systems,”Proceedings of 2007 International Conference on Circuits and Systems (ISCAS’2007), New Orleans. ISBN: 0-7803-9390-2

B. Linares-Barranco, and T. Serrano-Gotarredona, “A Physical interpretation of the distance term in Pelgrom’s Mismatch Model results in very efficient CAD,”Proceedings of 2007 International Conference on Circuits and Systems (ISCAS’2007), New Orleans. ISBN: 0-7803-9390-2

J. Costas-Santos, T. Serrano-Gotarredona, R. Serrano-Gotarredona, and Bernabé Linares-Barranco,”An AER Contrast Retina with On-Chip calibration,”Proceedings of 2007 International Conference on Circuits and Systems (ISCAS’2007), New Orleans. ISBN: 0-7803-9390-2.

L. A. Camuñas-Mesa, A. J. Acosta-Jimenez, T. Serrano-Gotarredona, B. Linares-Barranco,”Image Processing Architecture based on a Fully-Digital AER Convolution Chip,”Design of Circuits and Integrated Systems Conference 2007 (DCIS’07), Sevilla, November 2007. ISBN: 13 978-84690-8629-2

J. A. Perez-Carrasco, T. Serrano-Gotarredona, C. Serrano, B. Acha, and B. Linares-Barranco,”On the Computational Power of Address-Event-Representation (AER) Vision Processing Hardware,”Design of Circuits and Integrated Systems Conference 2007 (DCIS’07), Sevilla, November 2007. ISBN: 13 978-84690-8629-2

J. A. Leñero-Bardallo, R. Serrano-Gotarredona, L. A. Camuñas-Mesa, T. Serrano-Gotarredona, and B. Linares-Barranco,”The Stochastic I-Pot: A Circuit Block for Programming Bias-Currents,”Design of Circuits and Integrated Systems Conference 2007 (DCIS’07), Sevilla, November 2007. ISBN: 13 978-84690-8629-2

Journal Publications

Rafael Serrano-Gotarredona, Teresa Serrano-Gotarredona, Antonio Acosta-Jimenez, Bernabé Linares-Barranco, Clara Serrano-Gotarredona , Alejandro Linares-Barranco, Gabriel JimŽnez-Moreno, and Anton Civit-Ballcels. “A Real-Time Mixed-Signal AER Image Convolution Processor Chip with 16x16 Programmable Kernel,” IEEE Trans. on Neural Networks. In press. June 2008..

F. Bahmani, T. Serrano-Gotarredona and E. S‡nchez-Sinencio. “An Accurate Automatic Quality Factor Tuning Scheme for Gigahertz Range LC Filters,” IEEE Trans. on Circuits and Systems, Part I: Regular Papers, vol. 54, issue 4, pp. 745-756, April 2007.

R. Serrano-Gotarredona, L. Camuñas-Mesa, T. Serrano-Gotarredona, J. A. Le–ero-Bardallo and B. Linares-Barranco, “The Stochastic IPOT: A Circuit Block for Programming Bias-Currents,” IEEE Transactions on Transactions on Circuits and Systems, part II: Express Briefs. vol. 42, No. 9, pp. 760-764, September 2007.

B. Linares-Barranco and T. Serrano-Gotarredona,” On an Efficient CAD Implementation of the Distance Term in Pelgrom’s Mismatch Model,” IEEE Transactions on Computer-Aided-Design. Vol. 26, No. 8, pp. 1534-38. August 2007.

J. Costas-Santos, T. Serrano-Gotarredona, R. Serrano-Gotarredona and B. Linares-Barranco,”A Spatial Contrast Retina with On-Chip Calibration for Neuromorphic Spike-Based AER Vision Systems,”IEEE Transactions on Circuits and Systems, part I: Regular Papers. Vol. 54, No. 7, pp. 1444-58, July 2007.

J. A. Leñero-Bardallo, T. Serrano-Gotarredona, and B. Linares-Barranco,”A Calibration Technique for Very Low Current and Compact Tunable Neuromorphic Cells. Application to 5-bit 20nA DACs,”IEEE Trans. Circuits and Systems, Part-II: Brief Papers, in Press. 2008.

Milutin Stanacevic 2008

IEEE Services

Reviewer: IEEE TCAS I, IEEE TCAS II, IEEE TBCAS, IEEE TITBM, AIC&SP, BioCAS, ISCAS

Publications

Conference Proceedings:

X. Yun, L. Wang, K. Kalyanasundaram, M. Stanacevic and P. Gouma, "Binary sensor prototype for detection of signaling metabolites", submitted to IEEE Sensors 2008, Lecce, Italy, October 26-29, 2008.

X. Yun, M. Stanacevic, V. Kuzminsky and M. Gouzman, "Current-mode Preamplifier for Response Measurement of Semiconductor Scintillator", Proc. 51st. IEEE Midwest Symp. on Circuits and Systems (MWSCAS'2008), Knoxville, TN, August 10-13, 2008.

D. Kim, M. Stanacevic, R. Kamuo and Z. Mainen, "An Ultra-Low-Power Low-Data-Rate Neural Recording System with an Adaptive Spike Detection ", Proc. 51st. IEEE Midwest Symp. on Circuits and Systems (MWSCAS'2008), Knoxville, TN, August 10-13, 2008.

X. Yun and M. Stanacevic, "Extended Counting ADC for 32-Channel Neural Recording Headstage for Small Animals", *Proc. IEEE Int. Symp. Circuits and Systems (ISCAS'2008)*, Seattle Japan, May 18-21, 2008.

X. Yun, D. Kim, M. Stanacevic and Z. Mainen,"Low-power High-resolution 32-channel Neural Recording System", *Proc. 27th Ann. Int. Conf. IEEE Engineering in Medicine and Biology Society (EMBS'2007)*, Lyon, France, Aug, 2007.

X. Yun, M. Stanacevic, V. Kuzminsky and M. Gouzman, "Current-mode Preamplifier for Response Measurement of Semiconductor Scintillator", Proc. 51st. IEEE Midwest Symp. on Circuits and Systems (MWSCAS'2008), Knoxville, TN, August 10-13, 2008.

Orly Yadid-Pecht 2008

IEEE Services

Invited Lectures

“CMOS Imagers – Smart Sensors”, University of Rochester, May 2007
“CMOS Image Sensors characterization – revisited”, Kodak, Rochester, June 2007
“CMOS Imaging Circuits” - for the CMOS Emerging Technologies Workshop, Whistler, BC, July 2007
“Wide Dynamic Range Sensors” - for the Johns Hopkins University, Baltimore, US, Aug 2007

Other professional activities

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).
IEEE CAS Nominations Committee (2006 and 2007)
Member of the Technical Committee for the IEEE BioCAS conference (2004-present).
Member of the Steering Committee for the IEEE ICECS (2003-present).
Special Session co-organizer, “Low Power Image Sensors”, IEEE Circuits and Systems Conf, Seatle, Washington, US, May 2008.
Special Session co-organizer, “Smart Image Sensors”, IEEE Sensors Conference, Atlanta, Georgia, Oct 2007.
Member of the IEEE CAS Women in Engineering committee
Member of the IEEE CAS logo selection committee

Board memberships:

2007 - 2008 IEEE Trans. on BioMedical Circuits and Systems Associate Editor
2007-2008 IEEE Sensors Council, Circuits and Systems (CAS) Society representative (2007-2008).

Awards and honors

2007 **IEEE Fellow** for the design and modeling of CMOS Image Sensors

Publications

Peer Reviewed Papers:

Belenky, A. Fish, and O. Yadid-Pecht, "Global Shutter CMOS Image Sensor with Wide Dynamic Range", accepted to IEEE Transactions on Circuits and Systems II, July 2007.

V. Milirud, G. Jullien, O. Yadid-Pecht, "A Wide Dynamic Range Sensor with Motion detection", accepted to IEEE Sensors journal, May 2007.

M. Biderman, T. Tam, G. Jullien, O. Yadid-Pecht, " A low light level image sensor for bio medical applications", invited to Transactions on Biomedical Circuits and Systems", August 2007.

Y. Shoshan, A. Fish, X. Li, G. Jullien, O. Yadid-Pecht, "VLSI Watermark implementations and applications", to appear in the International Journal on Information Theory and Applications, Vol. 2, 2008.

Peer reviewed conference papers:

T. Tam, G. A. Jullien, O. Yadid-Pecht, "A CMOS Contact Imager for Cell Detection in Bio-Sensing Applications", Proc. IEEE ISCAS, CD ROM, New Orleans, May, 2007

A. Fish, T. Rothschild, A. Hodes, Y. Shoshan and Orly Yadid-Pecht, "Low Power CMOS Image Sensors Employing Adaptive Bulk Biasing Control (AB^2C) Approach", Proc. IEEE ISCAS, CD ROM, New Orleans, May, 2007

A. Fish, O. Yadid-Pecht and E. Culurciello, "Responsivity of Gated Photodiode in Silicon-on-Sapphire Technology", accepted to special session on Smart Image Sensors, IEEE Sensors conference, Atlanta, USA, October, 2007.

M. Beiderman, T. Tam, A. Fish, G. A. Jullien and O. Yadid-Pecht, "Low Light CMOS Image Sensor with Emission Filter for Fluorescence Applications", accepted to IEEE International Symposium on Circuits and Systems, ISCAS'08, Seattle, USA, May 2008.

A. Fish and O. Yadid-Pecht, "Power Reduction in "Smart" CMOS Image Sensors", accepted to IEEE International Symposium on Circuits and Systems, ISCAS'08, Seattle, USA, May 2008.

Book Chapters

Fish and O. Yadid-Pecht, "Low Power Smart Image Sensors", in "CMOS Emerging Technologies", edited by Kris Iniewski, CRC Press, planned for 2008.